Hobbyist and Entrepreneurs: A Study of the Interplay Between the Game Industry and the Demoscene

Sweden demoscene digital culture game industry hobbyists innovations and development blocks

Ulf Sandqvist
ulf.sandqvist[a]umu.se
PhD
Humlab
Umeå University

This article investigates the Swedish demoscene in the 1980s and 1990s. The aim is to explore the relationship between the scene and the formation of the Swedish game industry. The scene had a large presence in Northern Europe during the 1980s and 1990s, and these are also important years for the formation of the game industry. The scene has a connection to the development block linked to the major innovations in microelectronics and particularly the home computer. This article argues that through a generational effect the individuals born in the 1970s became an important base in the computer hobbyist scene and eventually the game industry. The spirit of collaboration, networking and friendly competition in the scene were likely a main motivator for the young enthusiasts but when they transitioned into commercial production, they would sometimes have to negotiate with the scene to try to avoid its effective non-commercial distribution capacity. Many of the game developers did not pursue longer university education, but it was likely not necessary in the 1990s if you had good computer skills and built a broad network within the scene in your spare time.

Introduction

It is hard to escape the enormous cultural and societal changes that have followed in the footsteps of recent advances in digital technology. Since their introduction into homes in the 1980s, digital technologies have evolved into an essential part of many people's lives. Most of us today are continuously consuming and creating digital material via the different devices we use. Games in particular have successfully migrated to new accessible platforms, making digital games ever-present in people's lives. Hence, their cultural and economic importance has increased. Games are even becoming an important driving force in the development of significant new media phenomena like VoD and streaming.

Among the different kinds of software, digital games are some of the most multidimensional and complex. By pushing the boundaries and utilizing the very latest digital technology, games can encompass a large array of cultural expressions. Game developers will also push and create a need for the development of future digital technologies. Gaming software is more demanding on hardware than many other types of software. Games are often at the digital audio-visual frontier and in a sense the evolution of games is an excellent visual example of Moore's Law (Moore 1965). However, the game industry has not always been at the very audio-visual frontier. In the 1980s and 1990s, the boundaries of digital technology were also successfully explored by non-commercial groups connected to the demoscene. The scene consisted mainly of computer-interested young men that developed audio-visual artworks at the intersection between digital art, software hacking, piracy and computer games. Over time, some of these individuals moved their focus and attempts to make a livelihood into game development. Thus, in the Swedish case, they contributed to the establishment of the Swedish game development industry (Sandqvist 2012; Maher 2012, 201).

There is a small emergent sphere of research about the demoscene. However, few have focused on the connections between the scene and game development. Hence this article aims to investigate the Swedish demoscene and especially explore the relationship between the scene and the formation of the Swedish game industry. The demoscene had a large presence in Northern Europe during the 1980s and 1990s and these are also important years for the early formation of the game industry and its especially formative years for the global dispersion of game development outside the core production centres in the USA and Japan. This article is therefore a contribution to the understanding of the history of the digital game industry particularly in Europe.

Previous literature and research

The interest in the history of the digital game industry has increased in the last decade and many new projects, books and articles have been dedicated to documenting and describing different aspects of the industry. Even though games and game developers have received a lot of attention, the demoscene is still sparsely investigated. Little has been written about the Swedish part of the scene, which is regrettable as it was likely one of the main hubs of worldwide demoscene activity (Borzyskowski 1996; Reunanen 2010). It seems safe to say

that Sweden had a culturally expansive scene with many demo groups, numerous local demo parties and, as a youth culture phenomenon, had at the time a presence in Swedish media.

An interesting historical aspect, especially in relation to the European case, is that the nations that historically have dominated the gaming industry, the United States and Japan, had less lively scenes. The explanation for the division is not clearly technical or economic. Both Japan and the United States had the same if not better conditions than several of the countries in northern Europe. These countries had prominent computer hobbyist cultures, but they were focused on other aspects like the free software movement in the USA (Reunanen 2010, 25).

In the Nordic context, the demoscene played a role in the early development of the computer gaming industry in the 1990s (Sandqvist 2010; Wolf 2015). Jørgensen, Sandqvist and Sotamaa (2017) have specifically discussed the links and connections in a comparative case study focusing on the Nordic scene and industry. Ernkvist (2007) has documented digital game development in Sweden from the 1960s in a contemporary witness seminar which also included representatives active in the demoscene. However, a broader and more overarching national approach has not yet been utilized.

In recent years there has also been a small upsurge of books about different hobbyist subcultures in Sweden (Goldberg and Larsson 2011; Linder Krauklis and Linder Krauklis 2015; Säfström and Wilhelmsson 2017). They are written by enthusiasts and none have directly described the demoscene, but they are insightful because of the descriptions of hobbyist culture in the 1980s and 1990s, and adjacent phenomena like hacker or gaming cultures.

Even though historical accounts about the demoscene are scarce, in the literature about the Swedish and Nordic game industry there is a strong narrative about the demoscene heritage. Many accounts describe the developers' background in the demoscene. Typically, the story would be linked to a few currently successful companies and their roots in different demo groups. Goldberg and Larsson (2013, 76–7) write about the Scandinavian scene and the connections to the industry:

Several Scandinavian groups became famous through demoparties – Hackerence and Dreamhack in Sweden; The Gathering in Norway; Assembly in Finland. These events established networks and began collaborations giving rise to the largest export giants of the

Swedish game industry. DICE has its roots in a demogroup called The Silents; Starbreeze, who developed the acclaimed games *The Chronicles of Riddick: Escape from Butcher Bay* and *The Darkness* was from the group Triton; and the Finnish group Remedy, known mostly for the *Alan Wake* and *Max Payne*, has its origin in the demogroup Future Crew.

These accounts are also frequently chronological and linear in their description of historical events. The developers started out in the demoscene where they learnt several skills that they later transferred over to their successful game development endeavours. Wong (2016) writes about the history of the Swedish game development industry:

From the demoscene days, when hobbyists got together to show how they could do amazing things, developers have always been keen to challenge the limits of hardware and software. Now they are doing the same on the triple-A, casual and indie scenes.

However, many of the reports and stories about the Swedish game industry seem to be trapped in what Huhtamo (2005) calls the "chronicle era". Most narratives are descriptive, sensationalist and focus exclusively on successful individuals or companies. The game industry in Sweden is also often framed as exceptional and leading. The idiom "The Swedish game wonder" is often used in Sweden, indicating that the development industry is a sensation and presumably unexplainable (Sandqvist 2010). One explanation might be that many historical accounts are written by enthusiasts and journalists who have a direct incentive to present an exciting and selling narrative. They lack a critical distance, analytic depth and do not frame the development within a broader context. This is also a recurring pattern within game and computer history (Fogelberg 2011, 31–2; Guins 2014).

In a broader historical context of game development, the influence of enthusiasts is not a unique phenomenon. The first computer games developed during the 1950s and 1960s were created without commercial interests on the mainframe computers available at different universities (Kline et al. 2003). European gaming development has often grown out of hobbyist and non-commercial contexts where individual enthusiasts have played a role (Izushi and Aoyama, 2006; Saarikoski and Suominen, 2009).

Aim and method

The specific object of investigation in this article is the demoscene and early game industry in Sweden in the 1980s and 1990s. The overarching purpose is to investigate more closely the emergence of the demoscene in Sweden as well as the intersection of commercial forces and user-driven cultural production. The main research question directing this research is: how did the hobbyist from the demoscene transition into the early game industry in Sweden? In a broad sense, looking at the demoscene and the game industry enables an empirical study of the socio-cultural and economic processes in the borderland between "independent culture" and commercialism. This can add to the knowledge about the conditions for the development of digital cultures and the relation between user-driven cultural production and commercial forces within the formation of a culture industry. With the increased interest in the game industry this study can also contribute to the understanding of cultural production in relation to the development of the computer gaming industry in a broad European context.

A problem when studying the history of the game industry is that reliable data about the industry is scarce (White and Searle 2013, 34). Few scholars have made comprehensive and reliable data available. This study will utilize a mixed methodological approach, which makes it possible to combine both quantitative (closed-ended) and qualitative (open-ended) material. This article is based on several different data sources: secondary sources, a longitudinal database and interviews with people active at the intersection between the demoscene and the game industry in Sweden. The descriptive macro perspective can be complemented with the more individual and personal stories.

The longitudinal database contains individual data on every employee that have worked at a Swedish game developing company 1997 to 2010. The data is collected by the Swedish statistical agency, Statistics Sweden and originates from several different Swedish agencies (SCB 2016). Researchers can apply for access to this data and the application process involves an ethical evaluation of the different variables to which the researcher requests access.

The interviews collected for this study were made in an oral history tradition (Thompson 2000). The demoscene did not leave much of a presence in any formal documents or public archives, so interviews are one of the few ways to approach this subject. By utilizing open ended semi-structured interviews and a life story approach, the researcher can engage in a

dialogue with the source. The interviewee's story is structured chronologically by the researcher, but the parts collected in this case were focused on the intersection and the transition between the two analytical spheres, the independent user-driven demo development and the commercial game development. The selection of interviewees was made so that it covers both successful game developer entrepreneurs and some that struggled along the way with their first game development endeavours. This choice was a way to circumvent or balance the more common linear hero narrative connected to the history of game developers.

Framing the demoscene and game industry

From a structural analysis perspective, the period from the end of the 1970s to 1990s constitutes a transformation period in a new longer macroeconomic cycle (Schön 2013; Taalbi 2014, 81–5; Sjöö 2014, 97; Sandqvist 2015). These periods arise from new development blocks connected to radical technological innovations, which are often general-purpose technologies. The new technologies are used to create new opportunities in a transformation process that creates many different new products and subsequently new industries will emerge. Such a process ultimately transforms large parts of the economy and reshapes society. An example from the 20th century would be the revolutionary effects generated by electrification (Taalbi 2017, 1442). The 1970s saw the origin of a new cycle and it was largely based on major innovations in microelectronics. This shift is more commonly referred to as the third industrial revolution (Sjöö 2014, 43–4).

For the broader public this meant that new digital innovations became accessible. Smaller and cheaper computers with microprocessors became available during the 1970s and a generation of more user-friendly computers targeting households were introduced during the early 1980s (Ceruzzi 2000, 263; Foster 2005, 18). Reunanen and Silvast (2009, 290) have pointed out that the home computer revolution was a core necessary for the development of demoscene. Particularly the introduction of the *Commodore 64* microcomputer in 1982 became of central importance, as it was a machine that the scene essentially formed around.

From a Swedish perspective the 1970s marks the end of an era with exceptional economic growth after WWII, sometimes referred to as the golden age of economic growth (Schön 2010, 321). Sweden had emerged from the global turmoil undamaged and large investments

into the industry meant that Swedish companies could produce for the large demand on the European market. Sweden transformed into one of the richer industry nations in the world.

The 1970s and 1980s also mark the height of the politics surrounding the Swedish welfare state. These policies were connected to the long-lasting influence and power of the Swedish democratic left. On an overarching level the Social Democratic Party manoeuvred to find a third way between state socialism and Western capitalism during the Cold War era. The core goal was to create efficient capitalist markets, but through wide-ranging state investments and wide-ranging regulations (Schön 2010, 312). The state came to be involved in many parts of society, from an expansive industry policy to culture and media policies (Syvertsen et al. 2014). However, the ideology of the Swedish Social Democrats was not oriented towards entrepreneurs and small businesses. Well into the 1990s their policies were instead primarily leaning towards expanding the state-owned service sector and supporting the private manufacturing industries, especially the large companies. Smaller firms were not seen as an important factor in economic development and occasionally even discussed as a problem. Therefore, the Swedish economy was regulated to promote the large national companies (Henrekson 2000; Andersson-Skog 2007, 458).

A consequence of the political development and the extensive welfare policies is that Sweden tends to stand out as an extreme in many international comparisons (Rothstein 2001). Sweden had a comparably even income distribution and would score at the very top in comparisons related to social factors/welfare measurements, gender equality, social capital and innovations (UNDP 2013).

The intersection between enthusiasts and commercialism

In the research about digital cultural production, it has been stated that the boundaries between those who create content and those who consume it are being erased (Varnelis 2008; Haggren et al. 2008). There are examples in many different areas such as the myriad of open source projects, the expansion of streaming sites like Twitch or global information gathering projects such as Wikipedia. The thresholds for participating and creating new content have also become lower (Jenkins et al. 2009). As digital technology has shown itself to promote user-driven production, the previously dominant ideas of production and consumption are being eroded as a clear two-sided process (Hardt and Negri 2000; Dyer-Witheford and De

Peuter 2009, 23; Ritzer and Jurgenson 2010). This, in favour of new notions of how the roles previously categorized in terms of *consumers* and *producers* flow together and interact. These processes encompass both the cultural and the economic spheres (Jenkins 2006; Fuchs 2008).

However, digital technology tends to have two opposite sides: the collaboration-oriented (open-source projects, community production etc.) and the profit-oriented, characterized by major companies like Facebook, Nintendo and Activision. It has been claimed that "colonies of enthusiasts", rather than large companies, drive creative development forward, and that the new creative cultures can transform capitalism (Rheingold 1994, xxi; Mason, 2008). The demoscene, which could be seen as such a colony, was one part of the larger computer culture, consisted of a loosely assembled network of independent enthusiasts tinkering with hardware and developing new applications. The scene gained a firmer and more stable form through computer magazine, computer gatherings and demo competitions. Its organizational form could potentially also be described as an "innovation community" (von Hippel 2005).

Within the enthusiast computer culture, many creative groups have not only had different values than those in the capitalist market economy, but also directly argued and acted against making profit of their creations (Levy 2002; Stallman 2002; Kaarto and Fleischer 2005). Nevertheless, there are many examples of commercial incorporation of the ideas, goods and services. In practice, it is often difficult to maintain an absolute distinction between commercialism on the one hand and genuine creativity on the other (Hebdige 1979).

Exploring the demoscene and the game industry

As far as at the historical chronology of the demoscene and the game industry goes it does not materialize in a vacuum. The scene and the industry were parts of a longer evolution connected to the diffusion of computers into different parts of Swedish society. There was for example a digital art scene from the early days of computers and computer production. Svensson (2000) writes that it is possible to define a scene of Swedish computer artists (Swedish: *datorkonstnärer*) from the mid-1960s. These early forerunners were often born in the 1930s and 1940s and had encounters with the very early computers at the universities or research departments at larger companies and started exploring and exhibiting digital graphics and music from the 1960s (Svensson 2000, 45f). Digital game production has a

similar history. Computer games were being developed since the 1950s and 1960s at universities and companies that developed computers, often as showcases for the capabilities of the new machines (Saarikoski and Suominen 2009; Sandqvist 2012). Commercial game development started immediately when the first home computers like the *VIC-20*, *ZX Spectrum* and *Commodore PET* were introduced (Ernkvist 2007; Sandqvist 2012; Sunhede and Lindell 2016).

Growing up with home computers

The Swedish demoscene emerged as a phenomenon during the second half of the 1980s. Renowned groups with Swedish members, like Triad, Fairlight, The Silents, CCS and Phenomena all started out during this era. Some of these demogroups also ultimately started organizing their own demoparties during the end of the 1980s and early 1990s. Recurrent annual and influential demoparties like Birdie, Hackerence and Dreamhack also started during this period and flourished during the early 1990s (Konzak 2015, 460).

The scene was in many ways a new youth movement. In the open Swedish economy digital technology had quickly become accessible for the larger masses and the scene was a way for youths to organize activity around the new home computers. This could be seen as a response to the economic realities of the new machines. New games and other forms of software were expensive and could also be hard to acquire from the commercial marketplace. Simultaneously the new technology was extremely suited for replication and distribution. It is possible to see how it would be appealing to engage in the culture to get hold of games and other forms of software. However, there was also a collective attempt to develop and improve software for the new open hardware. Håkan Sundell (nickname PHS), who became a member of the group CCS (Computerbrains Cracking Service), talks about how he got into the hobbyist culture in the 1980s and the importance of the user community to develop software for the Commodore 64:

> The machine [The Commodore 64] that was quite open. Maybe that's why the machine was so unique. It was possible to expand the functionality. It came with an operating system that was not that good. It was hastily done, so there were always opportunities for improvements. Being able to release improvements made me feel that I have control and you could exchange experience and programs with others and

> see who could make the best improvements and improve the machine. It was the users who built the application base for that machine. That is quite unique. Today, a PC is delivered with ready to use software. For the [Commodore] 64, it was simply the user who built it. A whole community was built with what they created among themselves. I was into this, you thought it was slow. I wrote a cassette turbo myself. Obviously, I called it PHS turbo. (Ernkvist 2007, 19)

International studies have indicated that most of the participants in the scene were born in the 1970s and early 1980s (Reunanen 2010, 26). Even if the picture is not clear in Sweden, this seems to be in line with the interviews and secondary sources from Sweden. The different demoparties or copyparties in the end of the 1980s and early 1990s were also often held at schools (Wilhelmsson and Grönwall 2014, 91), indicating that the participants were likely still attending them and thus probably not older than 18–19 years old.

The pattern is the same with the game developing industry, which shows a large dominance by individuals born in the 1970s (see Diagram 1). In other words, the founders of the many companies that emerged in the 1990s were very young when they started out. The average age of the employees was 27 in 1997 and had increased to around 32 by 2010. The pattern that a specific generation can be important to the diffusion of different radical innovations has been described as a "generational effect" in the structural analysis literature (Schön 2013, 103). When new radical innovations are introduced there is a knowledge deficit, since the workforce is locked in the old paradigm. This creates inertia due to a potentially very expensive mismatch in the human capital stock. A new generation that has been growing up with the new technology can possibly mitigate this situation. They can take advantage and even develop the innovations further. In this case the generation born in the 1970s was such an important generation related to software connected to the microcomputer.

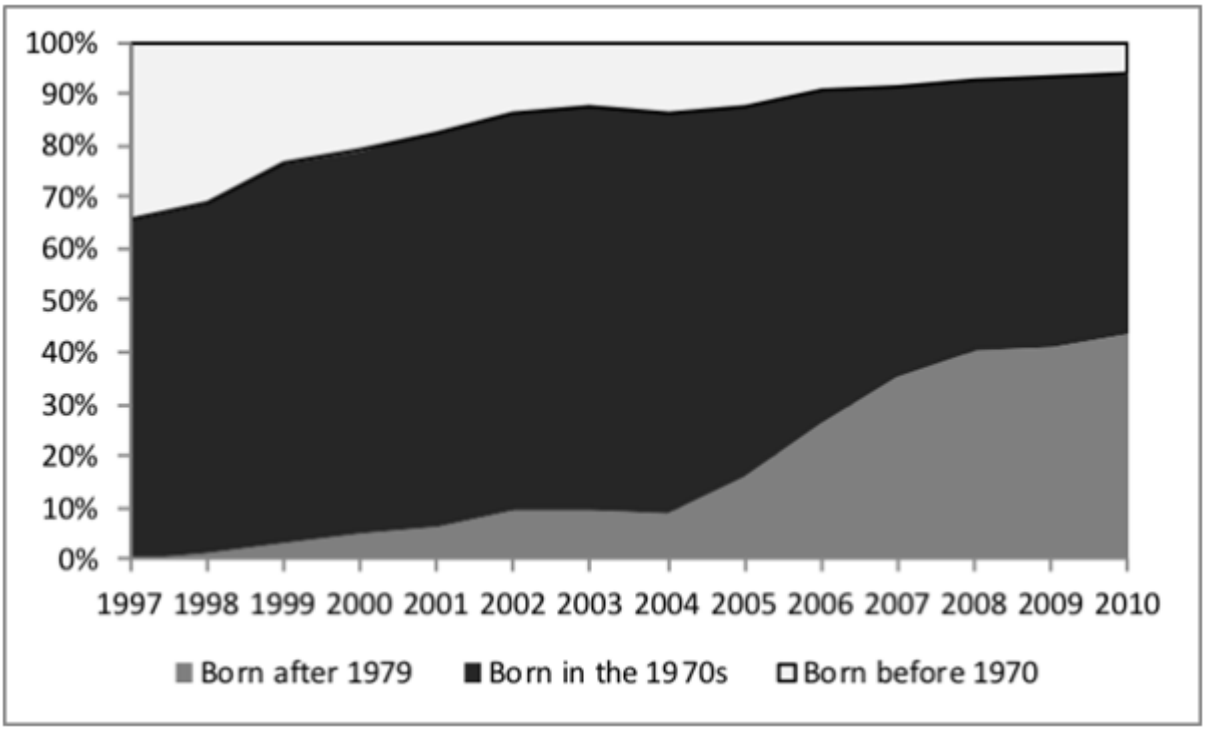

Diagram 1. The generations employed in the Swedish game industry 1997–2010.

Parents and computer education

Microcomputers were new and still rare in the early 1980s and the possible benefits and effects of computer usage were not always obvious. A report for the Swedish Commission for Informatics Policy (Swedish: *Datadelegationen*) in 1984 shows a tentative and ambivalent position towards digital games and their very immersive effect on children (Datadelegationen 1984, 19–20). This ambivalence was likely also true for many parents who were unaware of the future impact and importance of computers. This could even generate tension surrounding the time-consuming computer hobby. The parents of Oskar Stål (nickname Flamingo), a member of the demo group Triad, had concerns regarding the hobby:

My programming was probably not very popular with my mom and dad. They saw me sitting in the basement all the time, even in the summer. They were simply afraid that I would throw away my youth and that it would never lead anywhere. They also became suspicious and wondered if someone was taking advantage of youths by making them struggle with programming all day long. (Wilhelmsson and Grönwall 2014, 95)

Young computer enthusiasts could have a difficult time negotiating access to the computer. A new opportunity arose for some young hobbyist when the state invested in computer

education. The Swedish government decided to make computer science compulsory in the primary school curriculum beginning in the early 1980s. Kaiserfeld (1996, 252) writes, regarding the school initiative:

> This change in curriculum was consistent with an ideal of popular education that developed under Sweden's Social Democrats, who held political power in Sweden from World War II until the late 1970s. Part of this ideal was the belief that education across a wider social spectrum would lead to a democratization of society. Class differences could be eliminated by education, and more knowledge was generally seen as necessary if members of the lower classes were to gain more control of their own destinies.

The generations born in late 1960s and 1970s were benefiting from many of the welfare policies and specifically these investments and a large number of people involved in game development in the 1980s and 1990s would have been enrolled in the new computer courses. Christoffer Nilsson was part of the hobbyist scene and would later start the game development company Atod. He had the opportunity to pass the computer course by doing a special assignment, something that had positive side effects at home:

> My mother asked the teacher about the result of the assignment. He said, well there will be no problem for Christoffer to get a job as a programmer with all the knowledge he has. Then my parents understood that it was an occupation, even if it was not a common one. Then the mood changed. Someone with authority had said that this could actually be a job and it was not a waste of time. (Nilsson, Interview 2015)

Håkan Sundell took advantage of the computer courses that were part of his technical upper secondary school education (Swedish: *gymnasium*). Sundell used a special assignment to develop and maximise an application to compress data:

> I studied four years technical [an extended technical program at upper secondary school level], and I did special work just to focus on these principles. There were many who did this, for example, Mr. Z did it. We competed on who could do the fastest and best routines. This competition was really fun. You figured out if you have

> a 64-code game and pack it, how long did it take to unpack it again? Was it half a second? You sat with a watch and clocked it. Then you felt worried, well yeah Mr. Z has managed to do it a bit faster. Then you had to go back and optimize and count cycles. Could I tweak it a bit more until it got even faster? (Ernkvist 2007, 19)

During the mid-1990s a few upper secondary schools started new niche computer educations. Jens Andersson, was a member in the demo groups Yodel and The Black Lotus (TBL) and worked at Starbreeze, went to one of these first programs and talks about the connecting effect these educations had:

> There were only two places in the country, Uddevalla and Forsmark, that offered a computer specialization. […] It was fun, and I met people that today are active in the gaming industry […] there were so few programs available, so those who were driven and most interested came together there just like in the demoscene. (Andersson, Interview 2015)

Looking at the data from the game industry the lack of longer educations is telling of the structure (see Diagram 2). The hobbyist roots are likely in effect here when the early game developers had few formal credentials when working at these new tech companies. In the 1990s roughly less than 10 percent of the employees had a university degree and about 50 percent of the employees were fundamentally autodidacts. Over time the proportion of the autodidacts has decreased and with many new game specific degrees being established at Swedish universities most new employees have degrees.

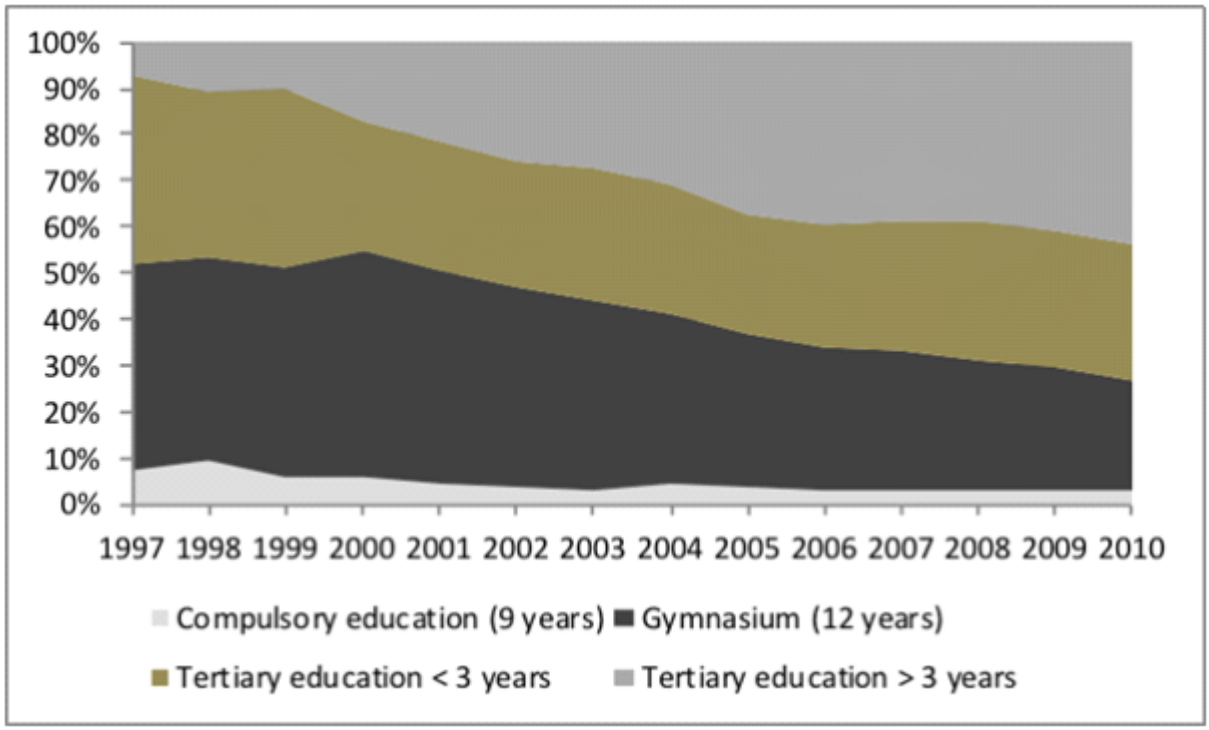

Diagram 2. Education levels, Swedish game industry 1997–2010.

Conflicts and tensions

The tension between the scene and games has historically been multidimensional. Most young people in the scene were interested in games, but the attitudes were not always overwhelmingly positive, and could even be hostile (Reunanen 2017, 46). Groups would crack games and distribute them so there was a clear material conflict and tension. The Swedish Commission for Informatics Policy discussed the prolific copying of software and its possible negative effect on the availability and quality of commercial software (Datadelegationen 1984, 18–20). For the demo scene cracked games were a major medium for distributing demos and copying games at parties was a common practice in the 1980s and 1990s. Reunanen (2010, 23) has questioned the notion that demo making and game cracking were separated activities. He writes “groups continued the legal and illegal activities in parallel, cracking games and making legal demos at the same time”. There might not have been a clear distinction between a legal demoscene absorbed in digital art production and a shadier cracking scene freely distributing commercial games. Large groups like Fairlight and Triad would have different sections involved in both activities. There was also over time a commodification of cracking and distribution activities via more organised illegal sales of cracked games. Håkan Sundell talks about this development in relation to the Swedish case:

> The Swedish [groups] did not deal with that kind of illegal activity, that money business was not present in Sweden. It was abroad, mainly in Holland [The Netherlands], as it was like that, often in combination with the fact that they were dealing drugs and such as well. (Ernkvist 2007, 22–23)

How widespread and organised the market for cracked games was in Sweden is difficult to assess, but it is safe to assume that cracked games were bought and sold by at least some unscrupulous individuals (Wilhelmsson and Grönwall 2014, 85). Whether there was a commercial interest or not, Swedish game developers came up with strategies to possibly negotiate with the crackers and pirates. At Digital Illusions they did not write a strong copy protection for their first game because they figured that it would be cracked anyway. They instead wrote a message in the code pleading to the anyone reading it not to crack the game (Jørgensen, Sandqvist and Sotamaa 2017). When the renowned Swedish group Fairlight cracked the game anyway, they in turn wrote in the intro text that the game was programmed by The Silents:

> We are indeed proud to present the AWESOME game to you! This game was programmed by a group of Swedes, better known as THE SILENTS! We strongly encourage you to purchase the ORIGINAL of this game and please do NOT spread the game to any lamers! We are proud to have such talents in our country and we STRONGLY encourage people to BUY THE GAME! (Pouet.net 2019)

This could possibly be described as a "code of honour" within the scene in relation to some of the releases. However, the Fairlight members could not honestly believe that the game would not be distributed among the community of Amiga users. Håkan Sundell talks about how they would receive games from old friends in the scene and how they then acted: "we got originals sent to us when someone who had started out in a cracking group had developed a game. In such cases you simply waited or did not crack it at all." (Ernkvist 2007, 25).

The tension with the commercial sphere could also by itself lead to unexpected connections and endeavours into the market space. Håkan Sundell was contacted by a Swedish game distribution company that had somehow connected them to the different scene releases of their games. Sundell talks about how the group were asked to make a commercial game for the company:

> In fact, in 1985, we did a commercial game, it was for a company called CBI (Computer Boss International), located in Eskilstuna. Christer Nydell [who owned CBI], was at the time engaged in distributing games. When he distributed games, he obviously noticed that there were people who bought games and then released copies. He contacted us and told us that I will sponsor you and make sure you do some more sensible things. (Ernkvist 2007, 21)

Starting a business

In the late 1980s and 1990s game development was still not very professionalized, and games could still be developed by smaller teams. Several demo groups and former members of demo groups transitioned over to game development during this period. For example, Atod, Digital Illusions, Starbreeze, UDS, O3 games and South End Interactive had their roots in groups like Northstar, The Silents, The Black Lotus, Triton, Cryonics and Limited Edition (Sandqvist 2012; Burman 2016; Sunhede and Lindell 2016; Jørgensen, Sandqvist and Sotamaa 2017). However, it was not necessarily their first game development endeavours since many members of the demoscene had started out tinkering with games and game development (Ernqvist 2007, 21; Burman 2016, 8). Oskar Burman (nickname OB), member of the demo group Anatomica and later at the company UDS, talks about his first connections with computers and his passion for game creation:

> I made games in STOS, a lot of games. I made games all day, or as soon as I got home from school. Some games I developed for a couple of weeks and made them pretty good and some games I only worked on for a day and then I got tired of it. I tried to bundle games that became a bit bigger, so tried to release them somehow. Eventually I tried to sell them. I released three or four compilations with two, three or four games on a floppy disk and there was a menu where you could choose the games. I advertised in Swedish and maybe some international computer magazine. (Burman, Interview 2015)

The young hobbyists that stated to transition into game production had the necessary computer knowledge and had likely fiddled around with game development before. However, they lacked knowledge in other areas and had for example not necessarily acquired business and management skills. Consequently, the young entrepreneurs did not always run their companies as traditional businesses, and some had unorthodox structures. A company like

Digital Illusions was organized more like a collective without a clear ownership (Jørgensen, Sandqvist and Sotamaa 2017). At the game developing firm UDS the developers lived and worked as a collective. They rented a small apartment that simultaneously functioned as the company office and living quarters. Oskar Burman talks about the early days of the company:

> It was five people who lived in an apartment in Norrköping […] Some of us had unemployment benefits so we got a bit of money that we shared. Someone else had some money which they invested in the company. We had few means, but everyone chipped in and did their part. (Burman, Interview 2015)

The young entrepreneurs also had to link up to the global game market. The lack of domestic publishers has always forced Swedish game developers to connect with international publishers and especially the more established UK industry. Christoffer Nilsson talks about the early experiences as young entrepreneurs in the commercial sphere:

> We were inexperienced regarding the language and the business. […] It was a hassle for us when we had to send an invoice in English. It was actually so unpleasant that we only sent one out of two of the instalments. (Nilsson, Interview 2015)

When starting companies, the background in the demoscene had some benefits. One indication of this is that the scene became an important recruiting network for new companies (Tyni and Sotamaa 2014; Jørgensen, Sandqvist and Sotamaa 2017). The competition for talented people with computer skills was fierce during the 1990s from companies outside game development (Sandqvist 2012). The development and professionalization of the game industry was also rapid, and the material conditions were changing. Håkan Sundell talks about working with games for many years and how many eventually ended up on different career paths:

> We also made games that were almost complete that we never sold, so we continued with the Amiga and the [Commodore] 64 and developed our own tools. We made design for levels and graphics. We built the entire development kit both on the 64 and the Amiga, but we did not have time or money to continue. We made it half way but never finished. […] Most went to upper secondary school and then after school most got something real to do. Then you got work at a company, Ericsson, Volvo or

> SAAB, and so did you do other things and you no longer had time for it. (Ernkvist 2007, 26)

Discussion

This article has focused on the hobbyist Swedish demoscene and the interplay between this scene and the commercial forces in the game industry. Everyone born in the 1970s in Sweden with an interest in computers and games was highly likely to encounter the scene. This was also a generation who were born when the Swedish welfare system was at its pinnacle and who could benefit from the high economic development but also from the public sector with extensive social policies like a free education system. However, the state investments into a new primary school curriculum was probably never the large motivating factor or even the primary source of knowledge for young computer hobbyists, particularly not in comparison to the opportunities to socialise, collaborate, network with like minded peers and take part in friendly competition that the different groups and the scene at large offered. However, Swedish teachers might have helped them to envision a future where it would be possible to make a living from what they already did in their spare time. The computer hobby was also a way for young Swedish computer enthusiasts to approach and negotiate a path into adulthood (Nissen 1993, 318). They were young and possessed advanced knowledge that could grant them work and consequently a bridge into the adult world. In the case of game development, some would carve their own path as entrepreneurs and business owners.

Looking back at this part of history, we need to remember that these were teenagers and young adults. As ex post observers it can be beneficial to try to put ourselves in their shoes for a moment without idealizing them or their achievements. Though some of the hobbyist were very young they possessed the right computer knowledge and a broad network of like minded people. They therefore had a small window of opportunity to transmission into game business and made use of the chance they got. The sometimes unorthodox and ad hoc business practice could possibly be influenced by their background in the non-commercial demoscene, but could just as well be connected to a level of youthful inexperience. Several of the early companies with ties to the demoscene would struggle or disappear (Burman 2016). However, a few developers, like Digital Illusions and Starbreeze, managed to connect to other more stable and established companies and eventually reached success in the new

millennium (Sandqvist 2012; Jørgensen, Sandqvist and Sotamaa 2017). On a general theoretical level, we may refer to this as a successful incorporation into capitalism, but this process required some trial and error.

The data indicates that a large portion of the young computer enthusiasts that went into the game industry did not pursue a university level education. This can possibly be explained by the generational effect connected to the new development block surrounding digital technology. Many Swedish sceners will be found within the game industry but also at other information and communication technology companies. The mismatch in the human capital stock was likely large enough that a formal education or diploma was of little use to the individual at the time. Such a situation probably only arises in a transformation period. The young computer hobbyists could use these circumstances to turn their hobby into companies, professions and careers.

In the literature there are some debates about the social functions of games and the computer culture. Games became a tool to introduce the broader strata and the working class to computers and information technology, henceforth preparing them for the new digital demands of the labour market (Datadelegationen 1984, 19; Arvidsson 2002, 28; Dyer-Witheford and De Peuter 2009, 28). Even though the collaboration-oriented scene partly worked against the industry, the scene helped to create and distribute games to the broader masses. Nissen (1993, 332) states that the youth computer subculture in a way also proved to the general population that it is possible to understand computers and master coding and therefore helped creating an interest in computers among the population in general. In this way the demoscene as a colony of enthusiasts might have been less of a counter culture and more of an actor in the creation of the first generation of digitally literate Swedes.

Moving forward there is a need for a more extensive mapping of the scene in Sweden. The historical development, the scale and scope of the scene ought to be studied and analysed more comprehensively. It would also be beneficial to do future inquiries regarding the ideology within the different hobbyist groups and the overall doxa of the scene. This would add to the understanding of the scene in general but also the transition into commercial activities as well as the broader zeitgeist in the 1990s with the transformation of the welfare state. The political context could also make Sweden a relevant case in a broader comparative research effort. The evolution of the Swedish scene and connections with the game industry

could be explored and contrasted with dissimilar countries like Germany, Netherlands and Australia. The network structure and the acquired skills were likely similar, but the national contexts could have influenced other aspects like the societal framing and opportunities for the hobbyist moving into commercial game development.

References

All links verified 16.6.2020

Interviews

Christoffer Nilsson, October 1, 2015, Interview done via Skype.

Jens Andersson, November 5, 2015, Interview done via Skype.

Oskar Burman, May 25, 2015, Interview done via Skype.

Websites

Pouet.net. 2019. *Pinball Dreams by Fairlight*, accessed 18 February 2019, www.pouet.net/prod.php?which=21486.

SCB. 2016. 'Beställa Mikrodata.' 2018. Statistiska Centralbyrån. Accessed February 24 2019. http://www.scb.se/vara-tjanster/bestalla-mikrodata/.

Wong, L. 2016. The Game Industry of Sweden. Accessed September 15 2018. https://www.polygon.com/features/2016/5/20/11686508/the-game-industry-of-sweden.

Literature

Andersson-Skog, L. 2007. In the Shadow of the Swedish Welfare State: Women and the Service Sector. *Business History Review* 81: 451–470.

Arvidsson, A. 2002. '"Grundrisse" och det allmänna intellektet.' *Fronesis* (9-10): 22-41.

Borzyskowski, G. 1996. 'The Hacker Demo Scene and Its Cultural Artifacts.' In *Cybermind Conference 1996*. Perth: Curtin University of Technology.

Burman, O. 2016. *Historien om UDS: ett svenskt spelföretag på uppgång och fall*. Stockholm: Näsets alfabetiska.

Ceruzzi, P. E. 2000. *A History of Modern Computing*. Cambridge, MA: MIT Press.

Datadelegationen. 1984. *Datoranvändning i hushållen: rapport från Datadelegationen*. Stockholm: Liber/Allmänna förl.

Dyer-Witheford, N. & De Peuter, G. 2009. *Games of Empire: Global Capitalism and Video Games*. Minneapolis: University of Minnesota Press.

Ernkvist, Mirko. 2008. *Svensk dataspelsutveckling, 1960-1995*. Stockholm: Avdelningen för teknik- och vetenskapshistoria, KTH.

Fogelberg, Hans. 2011. *Research on IT Use and Users in Sweden, with Particular Focus on 1990–2010.* Göteborg: Dataföreningen. http://urn.kb.se/resolve?urn=urn%3Anbn%3Ase%3Akth%3Adiva-38894.

Foster, Winnie. 2005. *The Encyclopedia of Game Machines: Consoles, Handhelds & Home Computers 1972-2005*. Utting: Gameplan.

Fuchs, C. 2008. *Internet and Society: Social Theory in the Information Age*. New York: Routledge.

Goldberg, D. & Larsson, L. 2011. *Svenska hackare: en berättelse från nätets skuggsida.* Stockholm: Norstedt.

Goldberg, D. Larsson, L. 2013. *Minecraft: The Unlikely Tale of Markus Notch" Persson and the Game that Changed Everything*. New York : Seven Stories Press.

Guins, Raiford. 2014. *Game After: A Cultural Study of Video Game Afterlife*. Cambridge, MA: MIT Press.

Haggren, K., E. Larsson, L. Nordwall, and G. Widing. 2008. *Deltagarkultur*. Göteborg: Korpen.

Hardt, M., and A. Negri. 2000. *Empire*, Cambridge, MA: Harvard University Press.

Henrekson, M. 2000. 'Företagaren och den svenska modellen.' *Ekonomiska Samfundets Tidskrift* 53 (2): 107–20.

Hebdige, D. 1979. *Subculture: The Meaning of Style*. London: Routledge.

Hippel, E. V. 2005. *Democratizing Innovation*. Cambridge, MA: MIT Press.

Huhtamo, Erkki. 2005. 'Slots of Fun, Slots of Trouble.' In *Handbook of Computer Games Studies*, edited by Joost Raessens and Jeffrey H. Goldstein. Cambridge, MA: MIT Press.

Izushi, H., & Aoyama, Y. 2006. 'Industry Evolution and Cross-Sectoral Skill Transfers: A Comparative Analysis of the Video Game Industry in Japan, the United States, and the United Kingdom.' *Environment and Planning A*, 38(10): 1843–61.

Jenkins, H. 2006. *Convergence Culture: Where Old and New Media Collide*. New York: New York University Press.

Jenkins, H., R. Purushotma, C. Katherine, M. Weigel, and A. Robinson. 2009. *Confronting the Challenges of Participatory Culture: Media Education for the 21st Century*. Cambridge, MA: MIT Press.

Jørgensen, K., U. Sandqvist, and O. Sotamaa. 2017. 'From Hobbyists to Entrepreneurs: On the Formation of the Nordic Game Industry.' *Convergence* 23 (5): 457–76.

Kaarto, M., and R. Fleischer, eds. 2005. *Copy Me*. Stockholm: Roh-Nin.

Kaiserfeld, Thomas. 1996. 'Computerizing the Swedish Welfare State: The Middle Way of Technological Success and Failure.' *Technology and Culture* 37 (2): 249–79.

Kline, S., N. Dyer-Witheford, and G.D. Peuter. 2003. *Digital Play: The Interaction of Technology, Culture and Marketing.* Montréal: McGill-Queen's University Press.

Konzack, L. 2015. Scandinavia. In *Video Games Around the World,* edited by M. J. P. Wolf, 451-67). Cambridge, MA: MIT Press.

Levy, S., 2002. *Hackers: Heroes of the Computer Revolution*, New York: Penguin.

Linder Krauklis, A., and D. Linder Krauklis. 2015. *Finna dolda ting: en bok om svensk rollspelshistoria*. Stockholm: Galago.

Mason, M. 2008. *The Pirate's Dilemma: How Youth Culture Reinvented Capitalism*. New York: Free Press.

Maher, J. 2012. *The Future Was Here: The Commodore Amiga*. Cambridge, MA: MIT Press

Moore, G. E. 1965. Cramming More Components Onto Integrated Circuits. *Electronics,* April 19.

Nissen, J., 1995. 'Hacker History and Sweden'. *Young,* 3(1): 50 -60.

Reunanen, M. 2010. *Computer Demos — What Makes Them Tick?* Helsinki: Aalto University School of Science and Technology.

Reunanen, M. 2017. *Times of Change in the Demoscene: A Creative Community and Its Relationship with Technology*. Helsinki: Aalto University School of Science and Technology.

Reunanen, M.. and A. Silvast. 2009. Demoscene Platforms: A Case Study on the Adoption of Home Computers. In *History of Nordic Computing 2*, edited by John Impagliazzo, Timo Järvi, and Petri Paju, 289–301. Berlin: Springer.

Ritzer, G., and N. Jurgenson. 2010. 'Production, Consumption, Prosumption.' *Journal of Consumer Culture* 10(1): 13–36.

Rheingold, H. 1994. *The Virtual Community: Finding Connection in a Computerized World*. London: Secker & Warburg.

Rothstein, B. 2001. 'Social Capital in the Social Democratic Welfare State.' *Politics & Society* 29(2): 207–41.

Saarikoski, P., and J. Suominen. 2009. Computer Hobbyists and the Gaming Industry in Finland. *IEEE Annals of the History of Computing* 31(3): 20–33.

Sandqvist, U. 2010. *Digitala drömmar och industriell utveckling: en studie av den svenska dator- och tv-spelsindustrin 1980–2010*. Umeå studies in economic history. Doctoral Thesis, Umeå University, Umeå.

Sandqvist, U. 2012. The Development of the Swedish Game Industry. In *The Video Game Industry: Formation, Present State, and Future*, edited by P. Zackariasson and T. Wilson, 134–53. London & New York: Routledge.

Sandqvist, U. 2015. '"The Games They Are a Changin": New Business Models and Transformation Within the Video Game Industry.' *Humanities and Social Sciences Latvia* 23 (2): 4–20.

Schön, L. 2013. *Tankar om cykler: perspektiv på ekonomin, historien och framtiden*. Lund: Studentlitteratur.

Schön, L. 2010. *Sweden's Road to Modernity: An Economic History*. Stockholm: SNS förlag.

Säfström, O., and J. Wilhelmsson. 2017. *Äventyrsspel: bland mutanter, drakar och demoner*. Malmö: Bokfabriken.

Sjöö, K. 2014. *Innovation and Transformation in the Swedish Manufacturing Sector, 1970–2007.* Lund: Department of Economic History, School of Economics and Management, Lund University.

Stallman, R. M. 2002. *Free Software, Free Society: Selected Essays of Richard M. Stallman*. Boston, MA: GNU Press.

Sunhede, T., and M. Lindell. 2016. *Svensk videospelsutveckling. Från 50-tal till 90-tal. En bok baserad på 150 intervjuer med svenska spelutvecklare*. Piteå: Mygrandmotherisgone.

Svensson, G. 2000. *Digitala pionjärer: datakonstens introduktion i Sverige.* Stockholm, Carlsson.

Syvertsen, T., G. Enli, O.J. Mjøs et al. 2014. *The Media Welfare State. Nordic Media in the Digital Era*. Ann Arbor: The University of Michigan Press.

Taalbi, J. 2014. *Innovation as Creative Response: Determinants of Innovation in the Swedish Manufacturing Industry, 1970–2007*. Lund: Lunds universitet.

Taalbi, J. 2017. 'What Drives Innovation? Evidence from Economic History.' *Research Policy* 46: 1437–1453.

Thompson, P. 2000. *The Voice of the Past: Oral History*. Oxford: Oxford University Press.

Tyni, H., and O. Sotamaa. 2014. 'Assembling a Game Development Scene? Uncovering Finland's Largest Demo Party.' *GAME* (3): 109–19.

UNDP. 2013. *Human Development Report. 2013, The Rise of the South: Human Progress in a Diverse World.* New York: United Nations Development Programme.

Varnelis, K., ed. 2008. *Networked Publics*. Cambridge, MA: MIT Press.

White, G., and S. Nicola. 2015. ‘Commercial Business Models for a Fast Changing Industry.’ In *Changing the Rules of the Game,* edited by Sabine Hotho and Neil McGregor, 20. Basingstoke: Palgrave Macmillan.

Wolf M. 2015. *Video Games Around the World*. Cambridge, MA: MIT Press.