

The research is commissioned by
The Research Grant Council,
Hong Kong Special Administration Region.
The project code is 4001-SPPR-09.

The European Game Industry



dr. David B. Nieborg &
prof. dr. Jeroen de Kloet,
University of Amsterdam

Table of Contents

List of figures & tables

Executive summary

1. Introduction

1.1 Aim of the report

1.2 Structure of the report

1.3 Methodology and empirical data

2. Defining and segmenting the European games industry

2.1 Which European game industry?

2.2 A brief overview of the European game industry

2.3 Key EU game industry characteristics: continuity & change

2.4 Major EU policy initiatives

3. Dutch Design? The political economy of the Dutch games industry

3.1 The history of the Dutch game industry in a European context

3.2 The Netherlands in the 90's: Planting seeds of growth

3.3 Building a foundation/infrastructure: 2001 - 2005

4. Clusters of the Dutch game industry

5. Conclusion

Literature

Appendices

List of tables & figures

Table 1: x

Figure 1: x

Executive summary

This report surveys the European game industries. Similar to the culturally and economically heterogeneous set of nations comprising the European Union, the European game industry consists of a patchwork of individual markets and industries. Rather than exploring the entire European continent in depth, this exploratory research will map the geographical creative clusters in the Netherlands, Sweden and the United Kingdom. Each industry is at a different stage of development and each country gives way to a different political economy and economic geography. Whereas the British game industry market is relatively large and its industry influential and productive, the Swedish and Dutch gaming markets and industries are much smaller. A comparative and historical comparison of three growing industries aims to offer a deeper understanding of clusters at different stages of industry development while acknowledging historical continuities.

Taken together, the European game industry as a whole is growing. Yet, the European game industry is highly divided, up to a point where one can wonder if there is such a thing as ‘The European Game Industry.’ Individual countries each grapple with a different set of challenges, and mapping these respective challenges will gain a deeper insight into issues of national creative policies and labor in a context of the intertwined processes of globalization and localization. Moreover, a comparative study will highlight the effects of state intervention and pan-European creative industry policy initiatives.

After mapping the game industries in general, and compare the UK, Sweden and Dutch case, this report will specifically focus on the creative clusters in the Netherlands. Because of its size it is argued that a study of the Dutch game industry offers a chance to flesh out the political, cultural and economic elements contributing to an industry in flux. The creative industry policies of the government, we will show, have played a vital role in the industry's growth. Numerous reports have quantified the volume of the industry and its growth potential. Yet, less attention has been paid to how this growth has come to be. This in-depth understanding is what this report aims to add to current knowledge.

1. Introduction

Ask citizens of one the 27 member states of the European Union about their national game industry and you will get 27 different answers. Italians might be rightfully proud of their fashion designers but the Italian game industry is rather small for a country of 18.6 million gamers. Compared to leading regions in North America and Asia, the European industry is the most diverse region with a wide range of countries that all differ in market size, demographics, local development communities, and creative industries related policy development.

The northern part of Europe - France, UK, Germany, the Netherlands and the Nordic countries - are leading nations in the European game industry. At the same time the European region has, compared to the US and Japan, been behind in terms of raising capital, employing game developers and capturing value. Historically, the EU lacked game major hardware developers within its borders and has only one major game publisher. This has significant effects and seems an irreversible trend in the console segment.

The EU region is doing remarkably well considering the relative lack of policy interventions and state subsidies. European Union led policy is starting to be developed through regional development funds and national tax incentives. The EU's strong points are the emerging opportunities related to digital distribution and online games. For example, Germany's Bigdoor and Gameforge and the Netherlands-based Spil Games are new and growing game studios.

When we zoom in on the Netherlands, there is a clear effect to be seen of a mix of game related education, an entrepreneurial spirit, a cultural infrastructure and a number of national and local (i.e. provincial) initiatives. A number of game industry sub-segments are starting to grow, such as developers of serious games, casual and mobile games, and several game serviced-related business (e.g. localization, business analytics and consultancy, game related R&D). Dutch independent ("indie") games met critical acclaim by receiving multiple honorable mentions and nominations at the Independent Game Festival.

With little state intervention until 2005, half of all Dutch game studios were founded after 2005 (xx). Maybe it is too early to label the emergence of the Dutch game industry as a success story. Yet, despite the credit and financial crisis, and despite a number of major Dutch businesses going out of business, overall, Dutch game studios are growing and keep on hiring people. A major policy step has been the labeling of the creative industries and the game industry particularly, as a "top sector". The "Topsectoren" government policy, which resonates with a global emergence of creative industry related policies, recognizes the game industry as a stand-alone growth sector and moved significant amounts of research related funds to initiatives that bolster industry/academia/government cooperation.

In the Netherlands, and the same can be said of the UK and Sweden, where the game industry is generally held in high regards. While there are outbursts of moral panic related to violent games and game addiction (cf. Williams, 2003), the overall tone and game industry related reporting is increasingly positive. The fascination of journalists and policy makers with the game industry is understandable. The Dutch game industry, as many other game industries, keeps on growing, and does so faster than other sectors in the creative industries.

1.1 Aim of the report

Given the relentless growth of the global game industry, it is somewhat surprising that there has been so little qualitative analysis of individual European countries. This neglect is in sync with a wider academic trend: "This industry has attracted surprisingly little attention from researchers of business and economics" (Zackariasson & Wilson, 2012: 1). Game scholars Kerr & Cawley (2012: 402) observed that there are a handful of academic studies focusing on North America (US & Canada) and Asia (South-Korea, Japan and China), a much smaller number of academics analyzed the political economy of European countries. Those who focus on game development communities outside the US or Japan stress that both countries have been, and still are in every respect dominant economies, exactly because of its constitutive history. They should therefore be treated not so much as paradigm cases, but rather as exceptions to the rule. The vast majority of local markets and national game development ecosystems, in the EU or across Asia, are all quite different in terms of its industry life cycle.

Apart from scholarly research on the UK, Ireland and Sweden, from which we will draw throughout this report, there is little scholarly inquiry into individual European countries, nor are there pan-European studies. The work of social geographer Johns (2006) offers an insightful analysis of the highly unequal distribution of power between actors in the global network of game production. More recently, an analysis of current state of the Swedish game-industry and its history demonstrates the added value of in-depth studies of individual EU nation states. "The Swedish case might be a relevant research object that can reflect the situation of game developers in smaller countries and also expand the understanding of the game development industry as a whole" (Sandqvist, 2012: 135). Therefore, one of the aims of this report is to offer both a historical and comparative study of the game industries of the UK, Sweden and The Netherlands as they have grown over the last two decades. Secondary comparative case studies include the Italian and German game industry.

This report aims to:

- Give a general mapping of the European game industries
- Present a comparative and historically informed analysis of the game industries of the UK, Sweden and The Netherlands over the last two decades.
- Present an in-depth analysis of the Dutch game industries.
- Reflect upon the challenges of creative industry policies, in particular in the domain of labor rights and environmental issues.

There is a decent amount of macro-economic, quantitative data available about the European Union and individual nations. Leading business consultants, such as PwC, and EU-related policy and research bodies (e.g. De Prato et al, 2010; 2012) offer valuable insights and a comparative context. Exactly because of its nascent status, an analysis of the Dutch game industry's coming of age offers an opportunity to see:

- (1) the effects and challenges of state intervention,
- (2) the effects of an industry moving towards digital distribution, and
- (3) the adoptions of new game platforms and the subsequent rise of industry actors focusing on serious games or casual games.

The Swedish and Dutch game industries demonstrated significant growth over the last decades but at a different pace and concerning different industry sub-segments. It is our understanding that comparing the leading European country (the UK) against two smaller but emerging industries offers an answer to a relevant political economic and policy-related question: How to jumpstart an industry or individual industry segments, or both? While there are quantitative data available on the historical trajectory of the Dutch gaming ecosystem, there are less qualitative or political economic analyses available.

This report engages Even though there is growth in local industries, Sandqvist offers a different reading of the "successes" of the Swedish game industry:

"From an economic *macro-perspective* this is a rather problematic industry. A lot of capital, grants, employees, educations and other resources have been allocated into game companies that have consequently not been able to return any profits. From such a perspective it would be more preferable to support a more robust and lucrative industry" (2012: 149).

That is to say, issues concerning precarious labor, value capturing and power relations among industry actors in general, are often absent in celebratory press accounts. One could say that such macro-perspectives benefit from a micro perspective. Next to a historical and comparative analysis of a select number of European game ecosystems, this report therefore aims to offer a micro economic reading of the Dutch game industry.

1.2 Structure of the report

This paper is divided in three main segments. Chapter 2 will define and segment the European game industry via a comparative approach. The size and major strengths and weaknesses of the European game industry will be discussed, as well as pan-European and national policy initiatives. Next, the history of the games industry of the Netherlands will be explored in chapter 3 and compared against the histories of the UK and Sweden. The growth of the Dutch game industry can only be understood from such a comparative perspective. It is argued in chapter 3 that the seeds of growth in the late 2000's were planted in the 1990's.

Finally, chapter 4 offers a number of political economic issues specific to the Netherlands in order gain a deeper understanding of its industry. After an overview of the current state of the

Dutch games industry, the report will discuss issues concerning labor practices and demographics of the industry, the clustering of companies in the Netherlands, and sectors, segments and the cultural, academic and institutional infrastructure of the Dutch gaming ecosystem. Chapter 5 lists key learning points for the Hong Kong game industry from the European and Dutch game industries.

1.3 Methodology and empirical data

This empirically driven report draws primarily on secondary sources, which present an overview of the development of the game industry in Europe. As part of an overarching study on the European industry in general and Dutch game industry in particular, 16 industry field expert interviews (60-120 minutes, semi-structured) were conducted with experts from the Netherlands and Sweden based in the Netherlands, Sweden, and the US. The interviewees are active as game critics, business analysts, developers of independent game studios, a PR representative, game designers, an academic, and two informants working for state sponsored business accelerators and regional development agencies. In addition, this paper draws upon a decade of ongoing interactions with Dutch game companies and several site visits to Sweden, the Netherlands, the UK, Finland, Germany and the US.

2. Defining and segmenting the European games industry

Following the political economic work of Mosco (2009) and Kerr (2006), this chapter picks up the issue of **spatialization**. (xx) The European game industry is a hodgepodge of 27 quite different nations, markets and industries. That said, there are a number of clear "leaders". The UK for example is in every sense the most prominent nation in terms of its market and industry size. This resonates with Johns, who argues: "Just as value is spread unequally across the software production network, it is highly spatially uneven, with several key nations and cities dominating various stages of the production network" (2006: 165). Johns' observation could very well be mapped onto the European Union, which also demonstrates a spatially uneven spread of value.

Kerr & Cawley note that: "[The] spatial distribution of the games industry is complex and is linked in part to the history of the games industry but more significantly to the regional structure of software production networks, as well as local and regional financial, cultural and labour markets" (2012: 404). This chapter will engage with the question whether there indeed is such a thing as a homogenous EU game industry. First, section 2.1 offers a macro and micro economic comparison of markets, demographic and industries. Next, section 2.2 surveys the major continuities and changes in the political economy of the EU region. The last section of chapter 2 provides a comparative study of a number of policy initiatives on the Pan-European and nation level, ranging from tax incentives through direct funding.

2.1 Which European game industry?

It would help policy makers, politicians, and game developers considerably if there is indeed a monolithic entity that could safely be labeled: The European Game Industry. Policy makers would benefit from a uniform ecosystem that could be further developed and stimulated via an integrated top-down approach. Game developers could benefit from a unified and fair set of regulations that would lessen intra-EU competition, increase cooperation and knowledge exchange, and would make the EU more competitive against heavily state-sponsored local industries such as Canada's and South Korea's.

The one major pan-European regulation effort that does have a significant impact on the European game industry is a restrictive rather than an enabling policy effort. In 2003 the Interactive Software Federation of Europe (ISFE) developed the Pan European Game Information (PEGI) rating system. The PEGI system ensures that there is an appropriate age

rating for games and that games are appropriately labeled.¹ PEGI asserts that its system: "is considered to be a model of European harmonisation in the field of the protection of children".² Ironically, like many other pan-European initiatives, the PEGI system is not used by all European member states, nor is it legally enforced across EU borders.

For example, Germany uses its own system called *Unterhaltungssoftware Selbstkontrolle* (USK), which is more restrictive compared to the PEGI rating. The USK system is, arguably, also more political. German politicians are outspokenly fearful of violent games because of their supposed harmful effects on young people. For example, rather than the more neutral moniker First Person Shooter, in Germany such games are called "killerspiele" (killer games). On multiple occasions have German politicians at the provincial and national level promoted legislation in order to ban violent games (Bramwell, 2009).³

As the PEGI rating and its implementation demonstrate, the EU is a patchwork of heterogeneous nations. The most obvious differences among countries are language and market size, which prevents many local game studios to develop games solely for their home market. Much like similar challenges faced by other sectors in the European Union, such as the agricultural sector, individual nations exhibit vast differences in terms of player demographics, the size of its game market and the number of game studios and publishers. Because of these vast differences the question arises: Is there such a thing as the European game industry?

Compared to the relatively monolithic industries of Japan, the US, and Canada, the legal, socio-cultural and economic differences between Belgium and the Netherlands, or the UK and Italy, are stark. Yet, if one thinks of the EU in similar terms as the United States where individual European countries are like US states, the differences are less pronounced. In the US, the differences between a state such as New Mexico and Georgia are as vast as between EU nations. Some US states offer comprehensive cultural industries centered policies, have a well-developed knowledge infrastructure, and have a large amount of game development studios. Other US states simply have none of that.

Therefore, and because of the European Union's recent more integrated policy initiatives related to the wider European game industry, it is relevant to speak of a European game industry. Despite the dominance of Japan and the US, there are efforts of harmonization, particularly policy related efforts. In addition, because of the Euro, European markets are increasingly interlocked and game developers seek cooperation across borders on an economic and technical level. On a cultural level there are major industry events that stress the EU as a singular unit, such as the annual GamesCom trade fair in Cologne or the Festival

¹ The system includes eight descriptors such as "violence", "drugs use" or "sex".

² See: <http://www.pegi.info/en/index/id/23>. Last visited: March 2, 2013.

³ <http://www.eurogamer.net/articles/german-ministers-attack-killerspiele>

of Games in Utrecht, both of which are promoted and understood as "European" events, rather than Dutch or German initiatives.⁴

It should be kept in mind that the biggest challenge of the European industry is also its main weak point: its diversity in terms of development clusters, infrastructure, and markets. One of the everlasting challenges of the EU project in general is the constant tension between pan-European harmonization benefitting the Union as a whole, and an individual EU nation's sovereignty. Before offering a deeper insight into the political economies of a number of specific EU states, the size and financial geography of the EU game industry as a whole will be briefly explored.

2.2 A brief overview of the European game industry

While the music industry's revenue keeps declining and the (book) publishing and newspaper industries struggle to adopt their business models to the era of digital distribution, the game industry is as adaptive as it is innovative. Consumer spending data on media and entertainment by IHS Screen Digest (Berhmann, 2011) show that as of 2008 game sales steadily outperform the categories of cinema, video and music.⁵ Similar to the global game industries, the European game industry has seen a decade of unprecedented growth compared to other segments of the media and entertainment industries. According to game industry lobbyist Berhmann: "The video games sector has enjoyed two-digit growth per year since two decades and is expected to continue to be the most dynamic digital content industry in Europe" (2011: 10). That is to say, the European game industry is at the forefront of changing business models, development practices, and equally important, greatly expanding its consumer base.

How, then, does the EU game industry compare against other regions? There are several metrics outlining the position of games in the EU. First, there is the size of the overall European market measured in consumer spending. Second, there is the number of active players, and thereby indirectly the potential number of consumers. And third, there is the size of local industries, which can be measured in revenue and number of employees. Suffice to say, these numbers indicate general trends and serve as a comparative measure against other regions.⁶

⁴ GamesCom is held annually in August, see: <http://www.gamescom-cologne.com/en/gamescom/home/index.php>. Festival of Games takes place in April in Amsterdam, see: <http://www.festivalofgames.nl/site/>. Both events host international visitors and speakers as well as a wide range of activities such as trade fairs, job fairs, network events, and all kinds of marketing and PR related activities.

⁵ These numbers all include both physical (e.g. discs, cartridges) and digital sales (e.g. subscriptions, micro transactions, downloads) and exclude hardware sales.

⁶ Many quantitative indicators from research reports are estimates and use different definitions in terms of

According to Prato et al (2012: 1), the European market is similar in size compared to the North American market. France, Germany, Italy, Spain and the UK represent the biggest market share with roughly 30% of the global market for games. The European market for 2013 is estimated by Newzoo to total US\$20 billion, of which the UK, Germany, France, Italy, Spain, the Netherlands and Belgium together combine 75%.⁷

In statistic overviews, Europe is often taken together with the Middle East and Africa, making up EMEA region. The most comprehensive aggregated data on the global game market is offered by PWC, who estimate that the EMEA region: "in 2011, with \$18.0 billion, is projected to grow by 4.8 percent" (2012: 348). This makes the EMEA region the second biggest market for games after the Asia Pacific region, bigger than the North American and Latin American market. Not only is the Asia Pacific region the biggest, it also has a compounded annual growth rate of 10.3% compared against EMEA's 4.8%.

Similar to the North American market, the overall European market is adapting to the era of digital distribution (see table 1). This means that the market for game console and handhelds (i.e. Sony's, Nintendo's and Microsoft's devices) is slowly retracting as it is gearing up for the eight generation of console hardware. The market for stand-alone PC games has been declining in single digit percentages for some time and will continue to do so. The biggest areas for growth are online (both browser based games and MMORPGs standalone games) and mobile games. Having said that, despite the massive attention in the popular press for mobile and online games, the console market segment still dominates and is estimated to continue to be the largest market segment in the foreseeable future.

Table 1 - Changes in the market (EMEA region).

Source: PWC (2012: 365).

As a market, the EU is atypical because local markets show significant differences in terms of sub-segment sales (PWC, 2012). While the console segment has the UK and France as leading countries in terms of revenue, the PC segment is relatively big in Germany.⁸ This goes to show that there are a number of cultural differences among European countries. For example, more Germans play stand-alone PC games than console games and when visiting

active players (i.e. how much time do you need to play per month to count as a player?), revenue (e.g. net or gross, Euro's or dollars?) and number of employees working (i.e. working directly on game development or in service related businesses such as analysts or for example the localization of content).

⁷ http://www.newzoo.com/wp-content/uploads/PRESSRELEASE_Games_Market_Growth_US_vs_EU_06-12-2012.pdf

⁸ Germany in 2012 totaled US\$ 601 million, compared to France's 433 and the UK's 282 (PWC, 2012: 377).

large electronic stores in Germany such as Saturn and Media Markt, the large isles with PC games specifically aimed at the German market draw immediate attention. On the other hand, the market for online games is relatively big in the Netherlands, which can be attributed to the high rate of broadband penetration.

The segment of mobile games is also quite different in terms of pan-European revenue distribution. While cellphone penetration in many EU countries exceeds a 100% (there are more cellphones than people in said countries), the aggregated revenue is much lower than console games or online games. While the Germans like to play on their PC's, they seem less fond of mobile games, spending a mere US\$58 million (in 2012) compared against US\$361 million in the UK. Remarkably: "Mobile gamers in Spain are spending more per capita on microtransactions than are mobile gamers in many other Western countries" (PWC, 2012: 374). Second to the UK most mobile game revenue is generated in Spain. **ADD: embassy report Spain & Newzoo analysis.** These numbers show how vastly different the EU is when comparing individual countries.

Closely related to the size of national markets and revenue splits among segments, are player demographics and preferences for game genres, business models and devices. Half of all Europeans aged 25-50 play games on a regular basis (Behrmann, 2011: 8). Yet, zooming in on individual countries, differences emerge. To a large extent, revenues tend to follow the time spent on playing games. But the issue of software piracy as well as the emergence of free-2-play online and mobile games makes such correlations harder.⁹ In terms of active players and payers (players who spend money) there are striking differences across Europe. Compare, for example, Italy and the Netherlands in terms of players, payers, time spent on games, and platform preferences (see table 2). While the Italians spent more time and money on an individual basis, there are relatively more Dutch players.

Table 2: Players and payers in Italy and The Netherlands (2012 estimates)

	Italy	NL
Population (x 1.000.000)	60.8	16.8
Active gamers (x 1.000.000)	18.6 (30%)	8 (48%)
Active internet population (x 1.000.000)	28.6 (47%)	14.3 (85%)
Payers (x 1.000.000)	9.3 (50%)	3.5 (43%)
Total money spent on games (x 1.000.000 Euro)	1800	570
Money spent per active gamer, per year (Euro)	96	71
Time spent on games (total hours per day x 1.000.000)	32	9.5
Time spent per person (hours per day)	1h43m	1h11m

Source: Newzoo, 2012.¹⁰

⁹ Piracy and other forms of copyright infringement seem to be much more culturally accepted in countries such as Italy.

¹⁰ Infographic 2012 Italy: <http://www.newzoo.com/infographics/infographic-2012-italy/> and infographic The Netherlands: <http://www.newzoo.com/infographics/infographic-2012-netherlands/>. Last visited: February 2, 2013.

There are several reasons why countries differ in terms of demographics and markets. Next to obvious cultural preferences, one can think of payment issues as well as infrastructural challenges. One of the reasons the Netherlands has such a large number of online players can be attributed to the high number of broadband connections. Similarly, a mobile infrastructure and a higher penetration of smartphones correlate with a larger number of mobile gamers.

It must be stressed that the size of a nation's market does not translate into a higher number of local game studios, employees or investments. Researchers of the Organisation for Economic Co-operation and Development (OECD) offer a snapshot of the game industry in the early 2000's and provide an overview of the leading global game industries at the time (Beinisch et al., 2005). The dominant game platforms were the PC and non-networked game consoles. As a result, existing developers and publishers that historically dominated console game development and publishing had a strong grip over game development, financing and publishing. As Behrmann (2011: 5) suggests, for two decades the European game industry has been rather console focused. This meant that EU has been a net importer of game hardware as the leading platform holders are predominantly non-European. To a large extent the same can be said of console game software.

Even so, the European industry is considered "a major world player in all segments of the value chain" and strongest in PC games (Beinisch et al., 2005: 15). Historically, major game development hubs in the EU were concentrated in the UK, Germany and France. Behrmann (2011) concurs with this view and argues that the "traditional" European development studios were for the most part established in the 1990s in the UK, France, and the Nordic countries. In the next chapter the political economy of the UK, Swedish and Dutch game industry and their history will be explored more in-depth.

Today, the majority of game developers are still located in the northern part of the Eurozone: "In Europe, a large population of these highly creative small development studios is found mainly in the UK, France, Germany, the Nordic countries and to a lesser extent in Spain" (De Prato 2010: 36). OECD researchers (Beinisch et al., 2005: 15) singled out the UK game industry because of its size, employing more than 20.000 people. Germany has "about 10,000 people working in the game industry at large international publishers such as Sony, Ubisoft, and Electronic Arts as well as at local companies like Bigfoot and Gameforge. Germany is at the forefront of the development of free-to-play online games, the fastest-growing segment of the online market" (PWC, 2012: 366).

ADD: PWC German report

<p>Table 3 - Large European game companies See workflow</p>

In sum, business analysts describe the European market as "fragmented", a competitive market in local markets, but also a territory with tremendous growth (ICO Partners, 2011).¹¹ Therefore, one could also argue that, compared to the two leading countries (Japan and the U.S.), the majority of individual EU states have no significant game industry. For example, while Italy and Spain do have a significant market for games, their local game industries are relatively small.

2.3 Key EU game industry characteristics

Given the heterogeneous nature of the European game industry, the question arises: What are the strengths and weaknesses of the EU game ecosystem as a whole? The major challenges enterprises operating in the EU are faced with are largely rooted in its history. Next, the major weaknesses of the industry will be discussed focusing on the absence of game publishers to be followed by an overview of the strengths and opportunities for European game companies. It must be stressed that the European industry is still growing and some countries, such as the Netherlands, witness high growth in terms of game related employment. Many of the new European ventures benefit from changes in platforms, audiences and the diffusion of new hardware platforms (e.g. smartphone and tablets). These new entrants benefit from the lower barrier to market entry or profit from a growing global gaming ecosystem. In addition, there are emerging sub-market segments such as serious games and indie games, middleware developers, or companies that are more service oriented including game industry analysts.

The absence of game publishers or platform owners is the primary concern for the EU industry according to the sparse academic and policy literature. The top-25 global game companies by revenues is dominated by non-EU companies (Newzoo, 2012).¹² The list has many US based companies (Microsoft, EA, Apple, Zynga, TakeTwo Interactive, Disney and Facebook, Activision Blizzard), Japanese (Sony, Nintendo, DeNA, Konami, Nexon, Namco Bandai, Square Enix, Capcom, Sega), South Korea (Ncsoft), and a number of new entrants from China (Tencent, NetEase, Shanda, Changyou). Many of these companies merged, acquired other publishers or are part of large multinational enterprises. Compared to US and Chinese companies, many Japanese game publishers, such as Sony, have a long history, often outside of digital games.

With the notable exception of the France-based game publisher Ubisoft, European countries lack major game publishers that are owned and operate in the EU. Today, European publishers such as Atari (FR), Eidos (UK), Codemasters (UK), and Playlogic (NL) are either defunct or acquired by non-EU companies. On top of that, while Ubisoft originates from, and

¹¹ <http://www.slideshare.net/ICOPartners/kgc-2011-the-european-market>

¹² <http://www.newzoo.com/free/rankings/top-25-companies-by-game-revenues/>

is headquartered in France, the last couple of years the publisher moved a large amount of game developer positions (exceeding 3000) to Canada mainly because of lower costs and tax incentives. In terms of platform operators, the EU has none except from the Finland-based Nokia, which does not hold the power it once did in the wider global game industry.

Parallel to the lack of game publishers is a diffuse and many times non-existent venture capital and financing culture. Forcing new studios to self-finance new projects and making them more sensitive to the already high-risk nature of the cultural industries (cf. Hesmondhalgh, 200x). Next to these three trends the major barriers to growth for the global game industry are related to skilled personnel, financing and IP protection.

Considering that the console game segment is still the largest sub-segment of the global game industry in terms of revenue, platform owners and publishers are still a formidable force in the development ecology. O'Donnell points to the structure of the console segment and the particular role historically held by platform owners and publishers: "From the time of the Atari VCS forward, a very particular structure emerged for the North American game industry, and this structure has only solidified the industry as it matured" (2012b: 101). With the passing of every console cycle, the monetary stakes increased, thereby cementing the role game publishers as brokers in risk.

The last decades the development and marketing budgets for console games have ballooned. The subsequent precarious position of game studios, both in the US and the EU should not be underestimated: "[The] need for an early investment affects the power relation in the value chain, and usually leads to the emergence of the publishers as pre-financing, and therefore dominant, actors to the detriment of the developers" (De Prato et al., 2010: 36). Game publishers such as EA, Activision, TakeTwo, and THQ have acquired many US-based development studios that are focused on console game development. Many of them closed relatively briefly after acquisition. For example, over the years US game publisher Activision acquired and subsequently closed at least nine studios and forcing layoffs in others.¹³ Two studios closed by Activision Blizzard were respectively British and Canadian, showing the ripple effects of global publishers.

Similarly, a number of European game studios went bankrupt exactly because of the high risks and high-upfront investments that accompany console game development. As opposed to online or mobile game publishing, the need for a physical distribution infrastructure and localized marketing campaigns alone make it challenging for independent game developers to publish a blockbuster game on the WiiU, the Xbox 360 (and its successor) or the PlayStation 3 and PlayStation 4. Major game publishers operate locally via offices

¹³ The closed studios include: Sierra Entertainment, Shaba Games, Luxoflux, Red Octane, Underground Development, Budcat Creations, 7 Studios, Bizarre Creations, and Radical Entertainment. Layoffs occurred at Neversoft and Raven Software.

around the world that tailor marketing campaigns and work with local retail partners.

The uneven power structure in the console segment is not unique to the EU or only affecting European game studios: "Game developers in North America continue to face structural barriers to openness" (O'Donnell 2012b: 112). The power held by Microsoft, Sony and Nintendo is felt by all entities among the value chain. It seems unlikely that the dominance of existing game publishers and platform owners in the console segment will lessen in the near future. The rise of a new European game publisher focused on the eighth generation of consoles by Sony, Microsoft and Nintendo would require billion euros of investments. Given the financial and credit crisis and the high risks involved with such a venture, no bank or investor would dare to embark on such a project.

One could question the need for investors as well as policy makers to even consider supporting console related game development initiatives. The high financial risks as well as the flow of capital to non-European nations might inspire policy makers to reconsider the console game development altogether. Also, as is documented by a large number of game scholars, the working conditions in the console segment exhibit a number of "quality of life" issues (xx, PhD). The console segment in the US "is a large industry characterized by intense work practices, high risk and volatility" (O'Donnell 2012b: 112). It is as of yet an open question whether or not non-console game development is less risky and has better working conditions.

Apart from some major challenges there are a number of strengths associated with Europe as a gaming ecosystem. The strengths of the European industry run parallel to a number of major techno-economic shifts in the global game industries. Spurred by the diffusion of networked technologies, the global cultural industries are undergoing a significant transformation in terms of production, circulation and content (Bruns, 2008; Schäfer, 2011). Cartridges have become apps, and retail stores have become online "stores" and "marketplaces". Instead of paying sixty euro for owning a game-disc, players all over the world have a wealth of game apps at low or zero costs at the tip of their fingers. This transformation leads to the emergence of new game markets, genres, formats, and business models leveraging the connectivity of networked platforms.

Academics, business analysts, journalists and industry professionals all seem to agree that the global game industries are at the forefront of this conversion (Chatfield, 2011; Kerr, 2006). In a matter of years, game developers and publishers have shifted en masse from a product-based logic of cultural production, selling physical content such as cartridges and discs, towards an online ecology sporting a service-based logic (xx, Sotamaa). Given that the European game industry never was able to "catch up" with leading game publishers in the pre-2005 console era, the newly forming global game ecology and the diffusion of new game platforms offers many new opportunities for EU countries. It allows the EU to leapfrog

towards an online market as it is not burdened by a heavy hardware game industry.

Key developments that have stimulated the growth of the European game industry are:

- The rapid diffusion of smartphones, tablets, social networks (e.g. Facebook, MySpace, Hyves);
- Game-enabling browser technology (e.g. Adobe Flash, HTML5);
- The diffusion of affordable broadband and mobile internet;
- The advent of application stores and payment solutions (Apple's AppStore, paypal, scratchcards).

The widespread global adoption of networked mobile devices and thus the rise of the mobile game segment did not start with what Juul (2010), in his landmark study on the cultural reinvention of the video game, calls "the casual revolution". But the appearance of new player types, novel game genres, and uncommon play styles, is certainly a prominent exponent of the revolution Juul theorized. Together with the market for browser-based games, the market for mobile games is estimated to grow significantly for years to come. The rate of smartphone diffusion in emerging markets is but one indicator of such prolonged potential growth (PriceWaterhouseCoopers, 2012).

OECD researchers Beinisch et al. (2005) point to a number of drivers benefitting the growth of the European game industry: (1) access to broadband Internet, (2) ICT related research & development, and (3) mass-market (usage of) games. First there is the ongoing diffusion of broadband connections. Particularly in the Northern part of the EU broadband penetration is high, which proved to be an important driver for "building a critical mass of users" (ibid: 32). There seems to be a clear connection between those countries with wide availability of broadband (cable and DSL connections and 3G or 4G mobile internet) and the formation and growth of a local game industry. Unsurprisingly, the countries with the highest numbers of internet-enabled households are The Netherlands, Norway, Sweden, Denmark, Germany, Finland, the UK and France (European Union, 2012: 107), which are the same countries with leading local game industries.

Second, countries with a high concentration of ICT research and development investments "may be at an advantage in providing the conditions for computer game development" (Beinisch et al., 2005: 34). Here, again, Northern European countries as Ireland, the Nordic countries and the Netherlands are leading in terms of business enterprise sector research and development expenditures. Game-related public research investments are growing as policy developers increasingly consider the game industries as a viable part of creative industries policy development.

Similarly, as De Prato et al. (2010: 9) conclude: "Some necessary conditions seem to have been met as regards providing a sound basis for the competitiveness of the EU video

games software industry: The EU benefits from a rich milieu of developers and an important population of middleware producers". The knowledge intensive nature of game development asks for high-quality software development and services. For example, Triple-A console games as well as less complex mobile games require a minimum set of constantly updated, sophisticated software tools.

Because of the modularity of game software (cf. Sandqvist 2012: 147) it is possible for game publishers and developers to either outsource certain development tasks or license middleware (e.g. game engines).¹⁴ The EU is considered as an important supplier of middleware, which can be contributed to high education standards (for example in math, algebra and programming courses). For example, Kerr and Cawley (2012: 411) signal that the Irish game industry hosts three notable middleware companies (Havok, Demonware, and Kore), which "require highly educated (usually to postgraduate level) staff". Moreover, middleware is an area of software that "has been able to leverage high-end technical skills and industrial and university research supports developed for the wider software industry". Next to middleware there are a number of sub-industries not directly related to game development, which have a sizable footprint in the EU. Those are localization and support (e.g. game community support and quality assurance) and companies that localize (i.e. translate) game-related content. For example, the Utrecht (NL) based company U-Trax was founded in 1997, employs a staff of roughly 40 and contributed to more than two thousand games.

Third, as discussed earlier there is an addressable market for games. That is to say, there are a number of overlapping demographic trends in terms of game use and preferences favoring EU countries. De Prato et al. (2010: 9) signal that: "The EU is strong on telecom services, especially mobile, and has seasoned customers". The example of Spain as an up-and-coming market for mobile games with above average spending is demonstrates that an established physical infrastructure (smart phones and the availability mobile internet) interacts with emerging platforms and new audiences (cf. Feijoó, 2012).

As a result of these three trends coupled to digital distribution opportunities and the associated disruption in terms of value chain disintermediation and emerging game platforms and genres, there are a number of avenues to pursue for EU game developers and related industries. Apart from (rather than?) console game development, a number of sub-sectors in the wider game industry are prone to seize the opportunities of a more direct connection with new gaming audiences.

There are four sub-market segments outside of console game development, which European countries are well positioned to leverage (cf. De Prato et al., 2012: 232-240):

¹⁴ "Middleware companies develop products and services aimed at game development studios rather than final customers" (Kerr & Cawley, 2012: 411).

- **So/Lo/Mo** (social, local, mobile games). More accessible distribution options for PC's and mobile devices provide opportunities for larger game developers (e.g. Spil Games in the Netherlands or Bigfoot in Germany) that focus on a specific segment such as browser-based casual games. Similarly, local development communities consisting of independent ("indie") developers are particularly prone to seizing the opportunities of emerging platforms. For example, while Italy has zero console related game development, it does have a vibrant indie scene (van de Veerdonk, 2012). And even though the indie scene, arguably, contributes less to GDP growth, it can be considered a hotbed for creativity and future game companies.
- **Gamification & Convergence.** The emerging market for gamification related products and services seems a perfect fit for the European industry. Gamification can be understood as "the use of game design elements in non-game contexts" (Deterding et al., 2011). On the one hand, existing companies such as marketing and media agencies seem well positioned to draw on "playful" or "gameful" design principles having a background in persuasive communication and interface design. On the other hand, as De Prato et al. (2012: 236) suggest, the game industry is increasingly converging with other more established parts of the creative industries such as the media (film, TV, publishing) and ICT sectors, for example to share and exploit intellectual property.
- **Serious games.** Serious (or "applied") games for non-entertainment purposes are different from entertainment games in the sense that they 1) are much more of a business-to-business market and 2) they require custom software solutions and have alternative distribution mechanisms (cf. De Prato et al., 2010: 20). Games for education and training can be used by governments, businesses, armed forces, in educational settings and in the health care sector. Serious game development is a knowledge intensive segment, as it requires input of domain experts, for example in serious games for health. At the same time, this "serious" trait also makes it a desirable sub-segment to support from a policy perspective. In the Netherlands the serious games sector is growing particularly because of state sponsorship. According to PWC (2009: 179): "The Netherlands is at the forefront of the industry in the development of serious games." The challenges for the growth of serious games development are related to localization of content, risk-averse institutions (e.g. education and government) as well as questions regarding validation (i.e. do serious games have the desired effects?).

- **Game related services.** The global game industries require a significant amount of game related services related to console game development and distribution, as well as new genres and formats. There are a number of game related services already offered by European countries such as 1) direct development related technologies (e.g. middleware, tools, development software), 2) localization (e.g. translation, consultancy), 3) development related services (e.g. outsourced content creation, quality assurance, community support), 4) market intelligence (e.g. market data and consultancy) and 5) miscellaneous services such as legal support and retail related services. One could also see applied game research as an activity adding value to a local gaming ecosystem.

While these drivers and conditions may not be sufficient to fully overcome the weaknesses in the "traditional" console game publishing, financing and game hardware development, taken together they do add up to significant economic and cultural value. This begs the question which policy initiatives may help to foster this development.

2.4 Major EU policy initiatives

Other than regulations concerning game ratings, pan-European policy initiatives have been rare. Part of this can be ascribed to the negative status of games as cultural objects (unlike, for example, cinema). In their survey of the Irish game industry, Kerr & Cawley found that the Irish games industry "suffered from a lack of understanding in policy circles of the content generation stage of the value chain and the asymmetrical power relationship between developers and publishers" (2012: 414). Our own experiences with Dutch government officials and creative industries policy experts strengthen the idea that there is indeed not a full understanding of the political economy of the European game industry. There are significant differences among EU nations as to the level of sophistication of game related policy such as tax incentives, subsidies, industry classification and regulations.

According to some, the lack of state subsidies makes game studios more profit-oriented and thus more self-sustainable. Game industry lobbyist Berhmann (2011: 3) notes that: "European game developers compete on a worldwide scale against highly subsidised competitors." There is room for state sponsorship, Berhmann adds, for early stage development such as prototyping aiding game related start-ups.

There are three levels of policy initiatives in the EU: pan-European, national, and local. The most developed sets of policy implementations take place at the national level.

Again, countries with sizeable game industries are much more active in publicly financing and supporting local business, most notably France, Ireland, the UK, Finland and the Netherlands.

One could argue that these disjointed policy efforts are emblematic for the EU and signal a lack of pan-European coordination as some policy effort increase intra-EU competition rather than raising competitiveness against the North American and Asian region. As De Prato et al. come to conclude, proposals at the national level "might be supportive for domestic game development, they do not necessarily rebalance the power positions in the industry. Instead, policy initiatives may need to focus on the opportunities and threats that are induced by the major trends reshaping the industry" (2012: 238). This observation is in line with Sandqvist's (2012) argument about value creation of transglobal game companies and the supposed profitability of game development in Sweden. Given the EU's strength's in broadband penetration and leveraging the power of agile development teams harnessing the affordances of digital distribution, it would indeed be wise to focus on online games, serious games, gamification and game-related services rather than console game development.

Based on the work of De Prato et al. (2012) a number of areas can be distinguished, which require further attention from a policy perspective:

1a) Cultural perception.

There seems to be agreement among researchers, policy analysts, and journalist of the low cultural perception of games and the subsequent effects on policy formulation. For example, in his analysis of the Italian game industry Van de Veerdonk (2012: 16) argues that there are three factors preventing growth; 1) lack of access to (venture) capital, 2) strong outside competition, and 3) the perception of games as being toys and child's play. As a result, there is no pressure to finance game-related public education and as a result the majority of Italian game developers are self-taught or schooled abroad. Conversely, because of the positive connotation of serious games in the Netherlands there has been significant funding in research and education as well as initiatives to strengthen export.

1b) Classification

The issue of classification of games as either software or "cultural content" seems like a trivial issue. Games are atypical compared to many other cultural products because they combine ICT-related business practices, are often capital-intensive, profit-driven, highly rationalized and heavily marketed productions, as well as being works of art. The EU's Directorate General for Competition, a policy body that develops and enforces EU competition rules, expressed that even though games indeed are software

they still should be regarded as cultural products. Many developers and game publishers actively promote and position games as software. The reason being that being qualified as cultural products has implications for regulations (e.g. VAT policies), funding and WTO trade negotiations. Because of the opposed viewpoints on this issue there is no clear consensus yet. Classification issues also arise when games are not a statistical category for policy and government bodies. For example, national chambers of commerce, governments (e.g. tax centers), and international research bodies such as the OECD often lack proper categorization, which prevents measuring game industry related growth (or lack thereof) and developing successful policies.

2) Education / labour

(...)

3) Tax (incentives), subsidies & financing

Whereas the low cultural perception of games in some European countries hampers policy development and state support, other countries are rather proactive in stimulating local game companies. Next to South Korea, one of the most active regions in the world supporting and arguably also one of the most successful countries exploiting game related policy development is Canada, specifically the Montreal region. The Canadian regions of Montreal and Quebec were among the first to incentivize game companies to relocate. From 1998 and 2005 tax credits were 50% (Berhmann, 2011: 5). Today there is a mix of federal and provincial government incentives available: "Quebec provincial tax credit of 37.5%, the Canada Media Fund at the federal level which can cover up to 75% of a project's eligible costs or a maximum of US\$ 1 million" (De Prato et al., 2010: 147). On top of that, Canada's location and its high level of education make it an attractive location exactly for large game companies.

There are considerable concerns among European game lobbyists and developers of the effectiveness of the Canadian tax policies. Ironically, the one major European game publisher (Ubisoft) seized the opportunity and within a decade created over 3500 jobs in its Montreal and Toronto studios. Today there are 8000 game developers in Montreal alone, out of 16.000 in all of Canada. Other game publishers opened new studio in the Montreal area such as Warner Bros Interactive, Eidos and THQ (Kelly,

2013).¹⁵ Martin Tremblay, an executive at Warner Bros Montreal states: "There's a real ecosystem of high-end developers here. If things keep going the way they are, in five or 10 years, it could be the next Silicon Valley in terms of videogames" (ibid). As a result, there are claims that Canada "has surpassed the UK as the third-largest game development market. From 2008 to 2010, the British game industry's workforce declined by 9 percent, while that of Canada increased by one-third" (PWC 2012: 366). Apart from tax incentives, it should be stressed that Montreal offers a sizable visual effects industry and its students and game related curricula are in high standing. There has been discussion in the UK of following the example of the Canadian tax incentive scheme. However, the change in political parties in the UK prevented the implementation of such initiatives (ibid).

Rather than offering tax incentives individual EU countries have offered financing via funds, often earmarked as "cultural support". The French game industry, it is argued by Beinisch et al. (2005: 46) lacks access to (venture) capital, at the same time the government sponsored the "Fonds à l'aide économique du multimédia (FAEM)", which has 4€ million for prototype funding and interest-free loans ("repayable only if a publisher buys the prototype"). Apart from the relatively high amounts of state sponsorship, the existence of the fund itself is an acknowledgement of the French government of games as artistic products.

The Nordic countries offer various support programs. An overarching effort is the Norden initiative (Nordic Game Program), which provides 800.000 euro in annual funding and provided funding for 104 game projects up until 2012 (cf. Sandqvist, 2012: 145).¹⁶ Individual countries also have public funding options such as the Norwegian support program "funded by the Ministry of Culture, which offers €1.2 million for "cultural" support plus €0.4 million for local launch support" (De Prato et al., 2010: 150). The Netherlands has the Gamefund ("Gamefonds"), which has 300.000 euro per annum for independent artistic game projects.¹⁷ Given the Dutch game industry's strengths (see chapter 4), there is discussion of the specific "artistic" of fundable projects. It is as of yet unclear what the return of investment or effectiveness of these national programs are.

The two main pan-European ways of support are the MEDIA fund and the more

¹⁵ <http://variety.com/2013/biz/games/tax-incentive-helps-montreal-become-videogame-central-1200005810/>

¹⁶ See: <http://nordicgameprogram.org/>

¹⁷ See: <http://gamefonds.nl/gamefonds.php>

generic instrument of region development funds. The MEDIA framework has been an instrument provided by the European Commission in order to support the media industries. The annual budgets range between €1.5 and €2.5 million. However these funds are direct at interactive works in general: "Interactive works for computer, internet, mobile handsets and games consoles (including handheld), presenting interactivity, scenario and innovation. New format concepts destined for digital television, internet or mobile handsets where interactivity and narrative elements are significant" (see Prato et al., 2010: 152). This limitation prevents dedicated game projects and means that game development has to be part of a wider project involving other media (e.g. film production). Behrmann argues that: "The MEDIA programme should include a substantial game prototype development / IP creation support scheme" (2011: 15). Many developers, including our Dutch informants that are familiar with the program, felt it was both artificial and "unfair" which prevented them from applying because the majority of game projects have no apparent link with TV productions.

The second way of (more indirect) funding consists of EU regional development funds. The European Regional Development Fund (ERDF) offers subsidies for "infrastructures linked notably to research and innovation, telecommunications, environment, energy and transport".¹⁸ Successful regional initiatives in the Netherlands such as the business accelerator Dutch Game Garden and Taskforce Innovation Region Utrecht both are partially funded via ERDF money.

There is a wide range of policy instruments available for states to support the game industry. All options come with their respective costs and difficulties in terms of implementation. The most popular instrument seems to be the establishment of dedicated funding bodies. There are also more ambitious policy recommendations. For example, some call for the "standardization of middleware (APIs) to facilitate the portability of game software over multiple platforms", or "public support to private venture capital to finance game development" (De Prato 2010: 153). As head of the European Game Developers Federation, Behrmann (2011) argues: "If European SMEs can compete on a level playing field globally, the EGDF expects a rapid growth of our sector's SMEs over the next five years and as a result a doubling of the 25,000 strong employee base to between 50,000 and 60,000". Standardization, access to capital, high quality education and favorable tax regimes are then to be considered on both a national and pan-European level.

¹⁸ See: http://ec.europa.eu/regional_policy/thefunds/regional/index_en.cfm.

3. Dutch Design? The political economy of the Dutch games industry

The story of the Dutch game industry is actually one of three tales. The first tale is the traditional, familiar story of the game industry as it has been told and retold many times. It is the well-know side of interactive entertainment, the world of video games. Shooters and strategy games together constitute, what Kline et al. (2003) dubbed a "militarized masculinity"; a culture where themes of warfare and conquest are privileged. This is an environment of predominantly male developers who develop games for other males. This side of the industry focuses on game hardware as much as it focuses on software and is in constant anticipation of the next big thing (Nieborg, 2011). Every year the sequel to a soccer games is bought (FIFA) or the sequel of that best-selling game of all time: Call of Duty.

This "hardcore" sub-culture and its historical roots extend to the Netherlands. Two decades ago hobbyists and amateur developers grouped together to form loose alliances. The Dutch game industry anno 2013 would not have existed without this small group of developers, who started studios that are remain influential up until today. Some of these video game focused studios went bankrupt; others merged or were acquired by foreign media and entertainment companies with much deeper pockets than any Dutch company. Yet, almost all of them had successes that made journalists, policy makers and educators attentive to the industry's potential and need for infrastructure, talent and state support.

The second tale of the Dutch game industry runs parallel to the first and is the story about the emergence of an entire new market for games. Since the mid-2000's, no matter which metric you use, playing digital games has increasingly become a mainstream activity. To play video games "has become the norm; to not play video games has become the exception" (Juil, 2010: 8). In the Netherlands, the introduction of the Nintendo Wii and DS were landmark events that shaped public perception about who could - or even should - play games. Browser-based casual games were increasingly played by the non-traditional (i.e. young male) gamer who had less of a disposition towards a "negative fiction preference" (Juil, 2010: 31).

The PC as an open gaming platform afforded the emergence of new genres such as browser based online games and 'social games', accessed via popular social networking sites such as Facebook.com. So-called casual games are less capital-intensive, require lower up-front investments and are far more suited for new market entrants than the high-risk environment of video game blockbuster production. The majority of new Dutch game studios have been able to grow because of their ability to leverage the versatility of the PC as a game platform.

The third tale is closely related to the second and is rather specific to the Dutch game

ecosystem. The last decade, Dutch policy makers in close cooperation with Dutch game studios and academics signaled the potential of non-entertainment or “serious” games as a market (cf. Bogost, 2007; Edery & Mollick, 2009). A serious game can be understood “a mental contest, according to certain rules, played with a computer, that uses entertainment to further governmental and corporate training, education, health, public policy, and strategic communication (Zyda, 2005: 2). Similar to the “casual revolution” (Juil, 2010) that took place around 2005, which marked the rise of non-hardcore entertainment games, the median year of establishment for Dutch serious game studios is 2005. This is all the more impressive considering the fact that half of all Dutch game studios (an estimated 250) develop serious games. There is a general consensus among interviewees and in industry reporting about the competitive edge of the Dutch serious game segment. Partly because of the sectors relative early start compared to other European countries, the segment is considered as having an edge and “leading internationally” (Boshove & Roso, 2012: 47). More so than the Dutch entertainment segment, the serious game segment is heavily state-sponsored. Local and national governments have acted as “launching customers” and significant funds (over 10 million euro in direct funding) have been allocated for serious game related research.

Taken together these three stories are reflective of wider game industry trends that signal a divergence in business models, markets, and audiences. Despite the credit and financial crisis, and despite a number of major Dutch businesses going out of business, overall, Dutch game studios are growing at an annual rate of 20% and keep on hiring people. It is too early to label the rise of the Dutch game industry as a success story. Interviewees express nervousness about new platforms, audiences and business models, which are as innovative as they are unproven. A CEO of a mobile game studio offers some flavour: “We worked with the four of us on a free (i.e. microtransaction enabled) mobile game for over a month and reached the respectable number of 150.000 downloads. To our surprise, we netted a mere 500 dollars, despite so many players”.

In this paper we argue that today's Dutch game industry is the result of a mix of the availability of game related research and education, an established cultural and Internet infrastructure and a number of national and local (i.e. provincial) government initiatives. We concur with Kerr & Cawley's observation that: “[The] spatial distribution of the games industry is complex and is linked in part to the history of the games industry but more significantly to the regional structure of software production networks, as well as local and regional financial, cultural and labour markets” (2012: 404).

Exactly because of its nascent status, an analysis of the Dutch game industry's coming of age offers an opportunity to see:

- (1) The effects and challenges of state intervention,

- (2) The effects of an industry moving towards digital distribution, and
- (3) The adoptions of new game platforms and the subsequent rise of industry actors focusing on serious games or casual games.

Before exploring the history of the Dutch game industry more in-depth, the histories of the British and Swedish game industries offer comparative cases to argue the relevance of an established cultural and physical infrastructure. More recently, an analysis of current state of the Swedish game-industry and its history demonstrates the added value of in-depth studies of individual EU nation states. "The Swedish case might be a relevant research object that can reflect the situation of game developers in smaller countries and also expand the understanding of the game development industry as a whole" (Sandqvist, 2012: 135). It is argued that the seeds of growth in the late 2000's were planted in the 1990's and, therefore, that the emergence of the Dutch game industry can only be understood from such a comparative perspective. After a comparative history we will discuss issues concerning labor practices and demographics of the industry, the clustering of companies in the Netherlands, and sectors, segments and the cultural, academic and institutional infrastructure of the Dutch gaming ecosystem. The paper concludes with an overview of the current state of the Dutch games industry, specifically the new market segments of serious and casual games and discusses the political economic issues specific to these emerging sectors.

This empirically driven paper draws primarily on 16 industry field expert interviews (60-120 minutes, semi-structured), which were conducted with experts from the Netherlands and Sweden based in the Netherlands, Sweden, and the US. The interviewees are active as game critics, business analysts, developers of independent game studios, a PR representative, game designers, an academic, and two informants working for state sponsored business accelerators and regional development agencies. In addition, this paper draws upon on secondary sources, which present an overview of the development of the game industry in Europe as well as a decade of ongoing interactions with Dutch game companies and several site visits to Sweden, the Netherlands, the UK, Finland, Germany and the US.

3.1 The history of the Dutch game industry in a European context

To understand and contextualize the size and development of the Dutch game industry it is worthwhile to briefly revisit the history of, on the one hand, the most significant European game market and its advancement: the games industry of the United Kingdom. On the other hand, the history of the Swedish games industry shows many parallels to the Dutch games industry and will therefore be used as a second comparative case. Arguably, the composition of the Swedish game industry resembles that of The Netherlands, with a few large companies

employing hundreds of, and many medium (10-50) or very small companies (cf. Sandqvist 2012: 144). Each of the national gaming ecosystems are at a different stage of development and each country gives way to a different political economy and economic geography. The Swedish and Dutch game industries demonstrated significant growth over the last decades but at a different pace and concerning different industry sub-segments. While there are quantitative data available on the historical trajectory of the Dutch gaming ecosystem, there are less qualitative or political economic analyses available. Whereas the British game industry market is relatively large and its industry has historically been influential and productive, the Swedish and Dutch gaming markets and industries are much smaller, yet growing rapidly.

Taking stock of the history of both countries and comparing them against the rise of the Dutch game industry, there are a remarkable number of similarities among the Dutch, Swedish and British industries. In his study of the North American game industry O'Donnell (2012b: 99) notes that: "The global game industry and the virtual game worlds it creates are sprawling, historically situated, socio-technical assemblages that require greater inquiry". The history and subsequent development of the British game industry is in many respects indicative of the development trajectories of other local industries across Europe.

All historic accounts of the video game, either academic or popular ones, start with the 1950's in the United States (e.g. Glas, 2004; Whalen & Taylor, 2008; Wolf, 2008). It is the story of W.A. Higginbotham's Tennis for Two and the PDP-1 (Programmed Data Processor-1) computer in the basement of the Massachusetts Institute of Technology, which allowed for the development of Spacewar! (Poole, 2000, Kent, 2001). The origins of the UK's game development history are different as Kerr observes: "the growth of a UK-based home computer industry started in the 1980's" (2012: 117). The evolution of the so-called "BritSoft" subculture consisted of amateur or semi-professional programmers working in small teams leveraging home computers. The British had the main advantage of having access to the affordable and accessible UK-developed Sinclair Spectrum 48k (1982). Interestingly, British citizens "had a rather ambiguous attitude towards gaming" (Wade, 2007: 684), an issue that seems to linger on until today. This ambivalence towards gaming translated in a lack of political support. At the same time, government-funded programs, such as initiatives by universities and the BBC, were influential by helping youngsters to become more computer literate (Kerr, 2012: 117). Thus, whereas the government itself largely ignored the game industry, public institutions like the media and universities played a pioneering role in its further development.

Conversely, the Swedish game industry is held and has been held in high regard throughout its coming of age. The Swedish press labels the game industry as "extraordinary successful" and "the Swedish game wonder" (Sandqvist, 2012: 134). As a result, there has

been substantial political eagerness to support the industry through tax incentives and curriculum development. Ironically, the analysis of Sandqvist (2012) suggests that the celebratory accounts and the popular and political understanding of the nature of the Swedish game industry are misplaced. While recently there is significant growth, especially in emerging sub-markets as the mobile and online segment, the net losses over the last decades of publicly traded Swedish game studios have been significant.

A Swedish mobile game developer has been highly successful with a mobile game that topped the charts around the globe and paints an ambivalent picture. He notes: "There is nothing specific to Swedish design culture other than that we might be influenced by Swedish designers. We like clean stuff." He adds that his small but highly profitable studio is faced outwards and has little connections with other Swedish studios: "The world is much bigger than you think. We immediately think global." Then again, the Swedish ecosystem was been vital to both the studio's existence and its stability as its key staffers worked at the major Swedish technology company Ericsson for over a decade and there are plenty of work-for-hire options to fall back upon would the studios' mobile games not have been profitable.

The evolution of a computer (sub)culture was not specific to the UK. However, the main difference with other European countries would be that the British were able to take better advantage of its "cottage industry" in terms of commercialization (Haddon, 1999). Wade (2007: 684) stresses importance of those early days of home programming and bedroom coding: "The relationships crafted in the early days were vital to success of videogames in the UK." The subculture of programmers who would develop and self publish their games alone or in duos turned out to be a breeding ground for talent, who, a decade later, would operate increasingly sophisticated game technology and higher budgets. This process took place in Sweden and the Netherlands as well with similar effects.

In the 1990's the British game industry was considered one of the "more mature 'new' media sub-sectors" in the country (Cornford et al., 2000: 84), whereas there was no significant equivalent in the Netherlands. As it has done throughout its history, the United Kingdom dominated European game production with "71 per cent of total development investment in 1998", with game industry related employment topping an impressive 13.000 jobs (ibid: 89). The advent of console game development asked for a better division of labor: "As the complexity of games began to grow, so did the need for areas of specialization" (O'Donnell, 2012a: 19). Development teams for console games ballooned, a trend that has not stopped until today.

Throughout the nineties, British game studios merged or were acquired by leading endogenous game publishers or game platform operators, such as Sony and Nintendo. The sophistication and value of the British games industry meant constant cycles of boom and bust: "The acquisition of companies and the relocation of game production to cheaper cost

locations are themes that recur through the history of the games industry in both Ireland and the UK" (Kerr, 2012: 118). The professionalization of game development in the 1990's translated into a more capital-intensive mode of game production, requiring outside investments and concentration of ownership. The sizable list of British studios that were acquired by British, American and Japanese companies demonstrates both the viability of the British market as well as the ongoing trend of concentration of ownership among companies from a very select number of countries.

Compared to the British game industry and market, the history of the Dutch game industry is both very brief and rather recent. On the one hand this is understandable considering the relatively small size of overall the Dutch economy as well as its creative industry. A Dutch regional policy expert notes: "In the Netherlands the Dutch game industry is already bigger in terms of revenue than the music industry. There is a lot of ambition and potential. We tend to say that the Dutch game industry is in its puberty. Adolescents are known to want to conquer the world. On the other hand they are aware that they not fully capable yet."

Similar to Sweden, the Netherlands historically lacked a significant domestic market for games: "Game developers from smaller countries will have small domestic markets and few actors in support industries" (Sandqvist, 2012: 135). The addressable market for games (including console, online, and mobile games) in the Netherlands was 831 million US dollars in 2012, the Swedish 389\$ million, while the British market totals 3.844\$ million (PWC, 2012: 368). This makes the local Dutch and Swedish market substantial enough for launching light productions (e.g. mobile games), but too small for million Euro blockbuster video game productions.

3.2 The Netherlands in the 90's: Planting seeds of growth

Because of the size of the local market, Dutch companies have historically been forced to be internationally oriented. The Dutch cultural, digital and educational infrastructure is of high quality and in many respects faced outwards. The Netherlands has a gross domestic product (GDP) that ranks sixth among European member states while the Dutch GDP per capita ranks very high, only second after Luxembourg. Moreover, in 2010 the Netherlands had the highest proportion of European households (91%) with Internet access (European Union, 2012: 107).¹⁹ Considering these numbers, one can see why the growth of a knowledge intensive industry as the games industry could take root so fast in the Netherlands. First, compared to

¹⁹ Note that households in the non-European Union member states of Norway and Iceland have similar numbers as the Netherlands.

more language oriented cultural products such as movies and TV-series, games are less dependent on language and are, arguably, less culturally specific in general. A policy expert: “For example, the global market for serious games is just about to become significant and is very developed in the Netherlands. There is a lot of international growth potential there.” Second, the densely populated cities of Amsterdam, Hilversum and Utrecht historically offer a state-of-the-art knowledge, cultural and digital infrastructure. For example, in the mid-nineties Amsterdam gave birth to a vibrant internet culture with initiatives such as "De Digitale Stad" (The Digital City); an online community where citizens could interact with local politicians. Interviewees stress the importance of high-speed Internet as a vital piece of infrastructure for starting game studios.

Up until 2001 the number of Dutch companies involved in the development or publishing of games added up to only a handful of studios. There was Radarsoft, a small studio that had some success with one of the first major commercial successes 'Made in Holland', but the studio was an outlier. Much like the Swedish game industry in the 1990's, the Dutch game industry had no footing and was "not attractive or lucrative enough for individuals and companies found opportunities in the growing commercial computer industry and ceased game development" (Sandqvist, 2012: 139).

But much like other European countries, in the 1980s and 1990s, small groups of prototypical "bedroom coders" (i.e. young males) tinkered with home computers like the Commodore 64 (1982) and Amiga (1985) as part of the so called "demoscene." As Sandqvist (2012: 140) explains, demos "were not interactive" but were "often technical achievements that demonstrated artistic creativity that pushed the boundaries of computer graphics". These proof of concept demos were mostly a labor of love, but also lead a number of enthusiasts to start businesses in the software domain. These groups of Dutch and Swedish programmers were vital in the eventual growth of what later turn into a more institutionalized and sizable set of businesses: "Eventually many of these young programmers became enrolled in commercial activities, and it was often these that started venturing into game development" (Sandqvist, 2012: 139). Tech companies such as the Swedish Ericsson have been vital as a source for highly educated developers. In other words, the seeds for its eventual, or arguably inadvertent growth were planted in the nineties (see table 1).

Table 1 - Significant games in the early Dutch game history

Date	Key games	Developer	Platform
1885	Eindeloos	Radarsoft	Commodore 64
1994	Jazz Jackrabbit	Epic MegaGames	MS-DOS
1997	A2 Racer	Davilex	Windows
1997	Meesters van Macht	IJsfontein	Windows
1999	Age of Wonders	Triumph Studios	Windows
2000	Amsterdoom	Davilex	Windows

An influential figure and one of those demoscene programmers was Arjan Brussee (1972), by some considered the "godfather of Dutch game development", who switched over from being a bedroom programmer to working on commercial projects like *Jazz Jackrabbit* (1994) and *Jazz Jackrabbit 2* (1998).²⁰ Brussee's studio Orange Studios would later merged into Lost Boys Games (2000). The history of PC game development is one of constant experimentation; the ideal habitat for self-teaching creative individuals to explore the affordances and constraints of game technology. Many game studios that have been highly influential over the last decades are established by men who have their roots in the demoscene. Think of the Irish Dave Perry, founder of Shiny Entertainment (1993), the British David Jones who developed *Lemmings* (1991), members of the "The Silent" demo group, which would later found the successful Swedish developer DICE, or the "Triton" group who would found Starbreeze Studios, based in Uppsala.

In the Netherlands, during the late nineties other bedroom coders did eventually take the entrepreneurial path. A group of demo coders led by Lennart Sas and Arno van Wingerden founded Triumph Studios, which published the *Age of Wonder* (1999) strategy game series. In a surprising historical twist, Triumph recently started working on an *Age of Wonder* sequel funded by the Swedish indie game developer Markus Persson of *Minecraft* fame. A third influential studio in the era of the CD-ROM was Davilex, a developer of office software that had brief successes with *A2 Racer* (1997) and *Amsterdooom* (2000), a shoot'em up. The games by Davilex were specifically aimed at the Dutch market and were considered to be of below average quality. Today, the mere mentioning of name of Davilex to Dutch game industry veterans indicates that there was little to be proud of.

Besieged by multinational powerhouses who merged with British studios and where on the lookout to exploit their existing IP portfolios, the game industry in the UK saw an increase in tie-ins with other media and the growth of franchises (Kerr 2012: 121). Conversely, the lack of a local support industry in the Dutch and Swedish industries made both countries more self-reliant. With no publishers to fall back on, no major entertainment properties to exploit, smaller companies had to develop their own technology and Intellectual Property (IP). As a result, companies like Brussee's and Sas and Wingerden's, but also influential and large Swedish game studios such as DICE, Starbreeze, Massive Entertainment and Avalanche Studios developed both their own software engines as well as creating an impressive amount of original IP. Even though IP creation, both in terms of game concepts, themes and software, is generally considered a value adding activity, the fact that US, French

²⁰ See:

<http://web.archive.org/web/20071026152657/http://developer.creative.com/articles/article.asp?cat=1&sbcat=31&top=38&aid=95>. Last visited: March 27, 2013.

and Japanese publishers own Swedish studios or fund (future) projects, mean that the potential profits, which in the case of a hit game can be significant, did not benefit the Swedish economy.

Apart from a select number of commercial productions, there was one game in the late nineties that proved to be an indication of an industry segment that would become one of the strongpoints of the Dutch game industry. Late 1997, three Dutch interaction designers who studied at the University of Applied Sciences Utrecht came together to develop *Meesters van Macht* ("Masters of Power", 1997), a CD-ROM-based game aimed at a younger audience (9-14 years old) and marketed as a "serious game". While today the serious or applied game sector can be considered a market segment of its own, the trio of IJsfontein Interactive Media was the first Dutch studio to explicitly develop a game with an educational bend. Leveraging the problem solving nature of games as interactive media, while playing *Meesters van Macht* children learn about physical phenomena such as light and sound. Apart from being a commercial success, the game met with significant critical acclaim, winning a prestigious BAFTA (British Academy of Film and Television Arts) award in 1998. This solidified IJsfontein reputation, but more importantly it served as an important hint of the cultural and economic potential of serious games.

The short list of Dutch games developed during the nineties pales into comparison with countries with a bigger development and publishing footprint. Notably absent are Dutch console games, which also at the time carried higher risks and were more capital intensive (Haddon, 1999). With no support system to speak of, no cultural infrastructure and no significant game-related curricula, the Dutch game industry faced the typical chicken-and-egg dilemma. With few operating game studios there was no room for new talent, there was no need for a national infrastructure, nor the apparent need for state policy. Apart from entertainment games, the founding of IJsfontein and the success of *Meesters van Macht* turned out to be a major milestone for what would become a vibrant sub-sector in the Dutch game ecosystem.

3.3 Building a foundation/ infrastructure: 2001 - 2005

Early 2000 meant a breakthrough for Dutch game developers. A fragmented part of the Dutch cultural industries slowly morphed into a more respectable self-sustaining sector. Three parallel developments demonstrated the cultural and economic viability of still a small collection of individual studios. First there was the advent of console game development and the rise of the first Dutch game publisher. Second, the Hogeschool voor de Kunsten Utrecht (Utrecht School of the Arts) developed the first Dutch game focused curricula. Third, in 2003

the inaugural conference of the Digital Games Research Association (DiGRA) took place in Utrecht. These milestones, among other initiatives, further institutionalized game development and publishing in the Netherlands. Arguably, by themselves these three landmark events would not have the ability to jumpstart an industry, but taken together they offered enough leverage for investors, aspiring developers, academics, journalists and state-actors to come together and build a better and more sound ecosystem.

One of the characteristics of the leading European game developing countries is the presence of game publishers. In the UK publishers as Eidos and Gremlin not only funded new productions, they also signaled the need for a support industry as well as the need for game development talent (Cornford et al, 2000). More so than developing games for home computers, developing console (video) games has historically been a capital intensive, high-risk endeavor. The first third-party video game publisher, Activision, came into being with the launch of the Atari VCS (1977). As chronicled by Montfort & Bogost (2009: 103), Activision founders "were successful VCS programmers with a refined technical knowledge of the machine as well as an intimate understanding of the commercial viability of their talents". Apart from their technological prowess, the entrepreneurial bend of the Activision founders was vital in the switch from the free-for-all, individual practice of coding for home computers into the more team-based, rationalized mode of production and circulation. After the Atari VCS, every consecutive console cycle meant a step up in terms of budgets and risks (Kline et al., 2003; Williams, 2002). The launch of the PlayStation 2 (2000) turned out to be the last chance for Dutch studios to enter the console game segment before the financial barrier to entry would be too high.

In 2001, the Dutch entrepreneur Willem Smit founded Playlogic Entertainment. With its headquarter in Amsterdam and an in-house studio, Playlogic Game Factory in the south of the Netherlands, the future looked bright for the new entrant. Soon the publisher employed an international staff of over 55 and financed projects employing an additional 115 developers. Initially, the financing of the publisher's projects came from a group of private investors. Late 2004 the company invested 12 to 15 million Euros in four games (Ammelrooy, 2004). June 2005, the company went public and was listed on the OTC Bulletin Board in New York. Next to publishing PC games, the in-house studio developed PlayStation 2 games such as the racing game Cyclone Circus (2006) and the shoot'em up Xyanide (2006). Throughout the publisher's existence it struggled to develop a much-needed hit to offset its losses on non-bestsellers. Many of Playlogic's games met with abysmal ratings. Later, the publisher struck a deal with Sony to develop games for the EyeToy camera peripheral, such as EyePet (2009). While those games brought in money, the publisher never struck it big and the company lacked the funds to pay its staff of 110 and external staff of 300. The last nail in Playlogic's coffin would be the development of the hack and slash action-adventure game Fairytale

Fights (2009) for the Xbox 360 and PlayStation 3. Even though the game did win a number of Dutch Game Awards, the game received poor reviews, which ultimately led to the demise of Playlogic.

Despite Playlogic's bankruptcy the company had an important legacy. Because of the lack of formal education in the Netherlands at the time, Playlogic had to attract talent from neighboring countries such as Belgium, the UK, and France. The publisher's activities did add credibility to the claim for more formal game design curricula. In Breda, the home of the Playlogic Game Factory, the Breda University of Applied Sciences (NHTV), started offering a game related Bachelor course. Testament to Playlogic's legacy, the International Game Architecture and Design course is specifically aimed at console game development. The four-year program prepares for common positions as visual artist, programmer, designer or producer. As an official partner of Sony, the NHTV develops games for the PlayStation hardware and software. The course employed Playlogic employees as lecturers and was voted "the best game programme nationwide" in 2012.²¹

Developing games for Sony, Sega, Microsoft or Nintendo's consoles, let alone develop true blockbuster material seemed forever out of reach for Dutch studios. That is, until the Guerilla Games published Killzone (2004) and ShellShock: Nam '67 (2004) both for the PlayStation 2. The Amsterdam-based studio build on the work of industry veterans like Arjan Brussee and benefitted from strong talent and management oversight. Roughly 90 developers worked on both games and Killzone's budget topped five million euros. Sony added another five million in marketing costs. Later 2005, Sony acquired Guerilla Games and made it a first party studio. The path of Guerilla Games goes to show the importance of industry veterans in founding and building a game studio, but is also indicative of the importance of publisher or platform holder support. Without the deep financial pockets of Sony it would have been doubtful that Guerilla Games would have become the influential studio it is today. In addition, the studio is highly internationally oriented, with 200 employees from 20 different nationalities.

Both Playlogic and Guerilla Games solved the chicken-part in the chicken-and-egg dilemma, as they need high quality game development talent to staff their teams. The Utrecht School of the Arts was the first higher education institution to offer formal training for developers. The Bachelor Design for Virtual Theater and Games (DVTG) has its roots in theater studies and design, and focused on the interaction between physical spaces and the virtual. Because of the DVTG's course success, the School founded the BA course Game Design en Development (GD&D), which is more focused on digital game design. In 2005 the first batch of students graduated from the GD&D program and among them were many

²¹ See: <http://www.nhtv.nl/ENG/bachelors/games/international-game-architecture-and-design/startpage.html>. Last visited: February 9, 2013.

students who founded a number of influential studios. For example, GD&D alumni Jaïn van Nigtevegt and a number of his fellow students founded Flavour: Playful Branding, an Amsterdam-based studio focused on gamification and advergames. The studio has a number of high-profile clients such as Volkswagen, Disney and MTV and employs a staff of over 15.²² As its name implies, the Utrecht School of the Arts focused on game design rather than game programming and still today qualified game programmers in the Netherlands are in short supply. The GD&D course would later be supplemented by more specialized courses at the Utrecht School of the Arts and courses at other institutions all over the Netherlands. Industry informants all agree that the GD&D in particular became a fertile breeding ground for future talent and demonstrates the importance of investing in proper game development.

Next to the rise of game studios and game courses, an important cultural event in the early 2000's was the inaugural DiGRA (Digital Games Research Association) conference. Four hundred attendees proved that the newly emerging field of game studies had growth potential. In addition, the Dutch press such as the evening news and quality newspapers covered the event thereby offering a powerful counter narrative to existing stereotypes of gamers and game research.

For a long time the Amsterdam-based Guerilla Games has been the most successful studio and their military-themed games are emblematic for the still lucrative segment of the global industry. With the advent of the Nintendo Wii and DS and the rise of online casual games, there is the start of a secondary narrative thread. Throughout 2006, the highly wired Dutch flocked to toy stores only to find out that the Wii was sold out. Gaming had not only "big business" and is still a global industry showing double-digit growth, it is slowly, but steadily becoming a more inclusive leisure activity. There are stories about gaming as a mainstream activity. February 2005 the Dutch casual game studio Zylom is bought by the US-based Real Networks for 17.2 million euro. The nine founders started their business in the south of the Netherlands in 2001 (Funnekotter, 2006).

3.4 2005 and beyond...

Up until 2000, the Dutch game industry was a ragtag consortium consisting of a handful of studios. At the same time, the Netherlands did have a flourishing game culture throughout the 1990's. Game magazines were published, console hardware and software sold millions of units, and far away from the general public students tinkered with game-related tools and technology. A Dutch game critic looks back: "Only a decade ago the current size of the [game] industry was unthinkable. The Dutch were light-years behind the UK, the US and Japan, but also France and Germany. To be blunt, nothing happened." Then things changed.

²² See: <http://www.flavour.nl/>. Last visited: February 9, 2013.

A review of daily quality newspapers stories discussing games and the Dutch game industry throughout the 1990's and early 2000's show that public perception changed rapidly.²³ Throughout the 1990's newspapers paid no attention to games "made in Holland". Journalists expressed a constant sense of amazement about new game technology and the diffusion of new platforms such as Nintendo's Game Boy (1989). It took until mid-2000 for journalist to recognize the existence of a local game industry and of its potential cultural and financial value. And still, a policy report by Dutch think tank ECP (Schermer et al., 2008) concluded: "Within the Dutch society there is relatively little (serious) attention for this emerging phenomenon", meaning the Dutch game industry.

The contrast with early industry stories and today's reporting is remarkable. Early 2013, there seems to be a story on the "success" of the Dutch game industry every other month. This is understandable considering the industry's spectacular growth. Half of all Dutch game studios were founded after 2005 and the following numbers should be seen against the background of an industry that consisted of a handful of studios in the late 1990's.

For 2012 it was estimated that 330 Dutch companies were dedicated to game development, circulation and associated services, employing over 3000 people (Koops & Bachet, 2012). Of the 330 companies, 250 are game studios. This number is relatively high compared to other European countries and outranks individual Nordic countries as Denmark (80), Finland (65), Norway (25) and Sweden (104), and even France, which has an estimated 150 studios (Dierckx & Bartelson, 2012: 62).

The overall revenue for 2011 was estimated to range between 150 and 225 million euro, the majority deriving from game production, followed by publishing, distribution, game technology, and associated services (Koops & Bachet, 2012). At the same time, employment at game companies is "flexible" as 84% of the game companies leveraged temporary employees, higher than in other creative industry sectors (GOC, 2012). The Dutch game sector is growing faster (21% more employees year-over-year) and shows little contraction (13%) compared to other sectors in the Dutch creative industry, such as the audiovisual sector, commercials (PR), multimedia and publishing (ibid.). Similarly, in terms of revenue and profit the game industry is steadily outperforming other sectors. In 2011, two-thirds of the game companies saw medium to high revenue growth and 76% was profitable.

Conversely, the volatility of the game segment is exemplified by a significant number of bankruptcies. Over the years a number of high profile game companies, all active in the entertainment segment, went out of business:

- Spellborn N.V., MMORPG developer, 2004-2008.

²³ Dutch quality newspaper were searched from 1990 - 2000 via the LexisNexis database using the operators "games", "game industrie" and "spelletjes".

- Streamline Studios, outsourcing (graphics), 2001-2009, reopened a Malaysian office in 2010.
- Virtual Fairground, game studio, 2008-2011.
- Gameship, associated game services (motion capture, audio/video), 2009-2012.
- Infinity Lane, mobile game studio, 2010-2013.
- UnitedGames, game developer and publisher, 2003-2013.
- Whitebear Studios, game studio, 2007-2011.
- Team6,
- thePharmacy, game studio, 2007-2010
- Playlogic Entertainment, game developer and publisher, 2002-2010.

In press accounts and court papers related to the bankruptcies, the main reason for liquidation is either related to the combination of a lack of contract work because of the economic climate or big-budget productions that did not meet expectations. Companies such as Spellborn and Virtual Fairground lacked both capital reserve and a diverse portfolio to cope with dwindling sales figures.

There are two sub-sectors constituting roughly half of the companies active in the Dutch game industry: those focused on serious (or "applied") games and simulations, and web-based (i.e. online or casual) games (GOC, 2012). The markets for both genres differ considerably. Entertainment games are primarily published globally, 65% of the revenue from entertainment games comes from abroad, compared to 7% of the revenue of applied games (Bartelson et al., 2012). Private or public parties primarily instigate the business cases of serious games. For example, a health insurance company orders a custom-made health prevention game. The localized and culturally specific nature of certain serious game genres (e.g. related to healthcare, education and marketing) hampers the reuse of both intellectual property and content. In addition, the serious game market is more of a business-to-business market where companies work together on a long-term basis.

Contrary to other European countries, there are more Dutch companies developing serious games than entertainment games, whereas the latter sub-sector employs more people (Koops & Bachet, 2012). The rest of the game companies are quite diverse including advergames, audio design, console games, handheld games, mobile games, outsourcing, PC games, porting, interactive television, technology (e.g. middleware), and tools and engines. Because many companies have "just" started, the company size is rather small with 66% of the game studios employing five people or less (ibid).

One of the few constants over the last decades has been the number of women employed in the Dutch game industry, a mere 13.5%. Similar to local game industries in the UK, Ireland, and the US, the average game industry professional still is predominantly male, white and young (cf. Kerr & Cowley, 2012, O'Donnell 2012b: 109-110). Next to revenue and employment growth, another area that was non-existent in the Netherlands a decade ago is a growing and productive knowledge infrastructure. Whereas the old guard of game developers

are primarily self-taught, the majority of game developers active since 2005 did receive a high quality education. Sixteen MBO's (intermediate vocational education) are active and in 2011 more than 300 programming focused students graduated, as well as over 900 game artists (GOC, 2012). Higher vocational education (i.e. polytechnics or universities of applied sciences) tracked over 1700 students with a game-related education. It is clear that the egg part of the chicken-and-egg educational dilemma has been largely solved. The cooperation between Dutch universities and schools and the industry has been significant. Game studios have been involved in teaching and curriculum design, over 40 companies participated in one of the many programs. One of the first major research projects was the GATE (GAME research for Training and Entertainment) project, which received 10 million euro in public funding and 9M in matching for participating partners. The program consisted of a consortium of universities, government bodies and industry representatives focusing on four themes: modeling the virtual world, virtual characters, interacting with the world, and learning with simulated worlds. As these themes suggest, the GATE program and many of its principal researchers and PhD-students were primarily focused on serious games.²⁴ Other major programs, such as The Creative Industry Scientific Programme (CRISP) and COMMIT are additional examples of heavily publicly funded initiatives that have a game-related component and stimulate public/private partnerships. Interviewees all stress that the serious game sector in the Netherlands would not be as vibrant without direct and indirect state-support. A policy expert: "Games are serious business and we have a solid base for serious games. National and regional policy makers have defined and detected an important niche. Whereas the rest of the world and game companies focused on entertainment games, such as World of Warcraft, we specialized in applied games without losing sight of entertainment games". The majority of serious game "genres" (e.g. health, finance, education and defense) are developed in the Netherlands. All require domain specific knowledge and because of that cooperation with universities is a logical part of major projects. Increasingly, serious games, for example in the health domain, require extensive validation tracks (e.g. clinical trials), which in turn require extensive higher education involvement.

In 2012, a major policy step has been the labeling of the creative industries and the game industry particularly, as a "Topsector" (i.e. an excellent industry sector), together with sectors as "Life sciences & Health" and "Water" (i.e. water management). The "Topsectoren" government policy, which resonates with a global emergence of creative industry related policies, recognizes the game industry as a stand-alone growth sector and moved significant amounts of research related funds to initiatives that bolster the so-called "golden triangle" (i.e. industry/academia/government cooperation). The policy puts a premium on valorization and

²⁴ See: <http://gate.gameresearch.nl/index.php>. Last visited, May 3, 2013.

asks game companies to contribute in-kind or financially to research projects. For example, early 2013, 7.7 million euro was awarded to 19 research projects, 9 of which were directly related to games, mostly serious games.

In terms of spatialization, the Dutch game industry is highly regionally clustered. The overarching region for game development is the “Randstad”, the densely populated conurbation consisting of the four major cities Amsterdam, Rotterdam, Utrecht and The Hague. Similar to other capitals (e.g. London, cf. Kerr & Cawley, 2012), Amsterdam houses both the most game studios (70+) and 700+ employees (Koops & Bachet, 2012: 24-25). Building on the work of Cornford et al. (2000) and Johns (2006), Kerr & Cawley argue: “Different functions cluster for different reasons in the games industry (2012: 414)”. For example, for a major studio such as Guerilla Games, a first party Sony studio developing Triple-A games for the PlayStation platforms, the international orientation of Amsterdam is a major reason for its location. The liberal image of Amsterdam is considered a competitive advantage to attract international talent. Testament to the diversity of the Amsterdam-based region are companies such as: Little Chicken (advergaming studio), IJfontein (serious game studio), Vanguard Entertainment (entertainment games), Flavour (gamification), Perfect World Europe (MMORPG publisher), Rough Cookie (mobile game developer), and Gamious (mobile game publisher). Many of the local offices of “traditional” international publishers such as Activision, EA, and Microsoft, are located in the Amsterdam/Schiphol airport area.

Next to Amsterdam is the centrally located Utrecht/Hilversum axis. Utrecht is home to two of the oldest and most renowned game curricula by Utrecht University and the Utrecht School of the Arts as well as business accelerator Dutch Game Garden (DGG), which is located in downtown Utrecht. Whereas Utrecht has no cultural history or major infrastructural advantages for hosting game companies, the game focused research and education, state-sponsored regional development bodies such as Taskforce Innovation Utrecht (TFI) and the DGG, propel the Utrecht region forward. A number of high-profile and successful start-ups such as Ronimo Games (2007), Vlambeer (2010), and Game Oven (2011) are located inside the walls of the DGG’s building and employ several Utrecht School of the Arts alumni. Even though these studios are small and their future is anything but assured, they serve as examples of the effects of a vibrant cultural infrastructure (i.e. the DGG) combined with well developed higher education efforts.

Contrary to Utrecht, the medium-sized city of Hilversum does have a long history as a creative hotbed as it is considered the “media capital” of the Netherlands; houses all major facilities of the Dutch public broadcasting infrastructure. The city has 10+ game studios, but is also the home of Spil Games, a major casual game developer/publisher employing an international staff of over 300. The company built the Spil Campus, offering workspaces for a staff up to 400 as well as recreational and long stay facilities. Peter Driessen, Spil Games’

CEO talks about the long-term ambitions of his company and is aided by the local government in its efforts: “The Hilversum municipality offered tremendous help with building our campus, with permits and connecting us to other parties. That’s why we can move forward much faster.” For Spil its campus is a major strategy in order to attract young talent and international staff to the city of Hilversum.

4. Emerging industry segments

Even though the Dutch gaming ecosystem is highly diverse, there are three emerging segments that are able to leverage different audiences, the affordances of digital distribution and less restrictive platforms: casual games, mobile games and the before-mentioned serious games. Traditionally, game publishers as Playlogic and console game oriented studios like Triumph Studios and Guerilla Games are hailed as ideal companies that fit well with the notion of the Netherlands as a “global player” and a “knowledge economy”. Yet, these companies have quickly become the exception to the rule as opposed to leading examples. The norm has become small, young, agile enterprises that staff well-educated, creative developers in one of the major Dutch cities. For example, Dutch independent (“indie”) games met critical acclaim by receiving multiple honorable mentions and nominations at the Independent Game Festival. Dutch serious games are exported and used by major foreign entities and government agencies. And Dutch mobile games have shot to the top of Apple’s App Store all over the world.

Online games are a perfect match considering the Netherlands’ quality Internet infrastructure. Major casual game portals such as Spil Games, Zylom and YoudaGames are based in the Netherlands and serve hundreds of millions of customers. The domestic market for online game is significant: “The Netherlands has one of the most active online markets in Europe, with revenues of \$334 million in 2011 due to its high broadband penetration, which surpassed 80 percent” (PWC 2012: 371). The market is expected to grow to \$452 million in 2016. The home market for casual games is important for companies such as Spil Games, as CEO Driessen explains: “We in the Netherlands have a rather international taste. That makes it easier to innovate here first and then release it overseas”. The company serves over 200 million users a month and translates its games into 20 languages. Despite the high number of graduated game students Driessen is still critical about the level and specificity of game curricula, pointing towards the need for “app developers” and students skilled in developing social games. Domains that are of the radar at all major game courses. Above all, Driessen calls for stark policy choices, to carve out segments of the entertainment and non-entertainment market that are focused on by both policy makers and businesses.

A second sector that is as of yet small but growing rapidly is the market for mobile

games. Several Dutch companies are active in the mobile domain and all signal the relatively low barrier to entry as an important reason to consider mobile game development. In his study of European mobile developers Feijóo (2012) argues that mobile development offers easier access to users, lower development and distribution costs, but less “bargaining power” with platform owners (e.g. Apple, Microsoft, Google) to influence platform technology and business models. Adding: “Developers are the key element in the innovations provided by mobile platforms, but at the same time the enhanced competition among games in any of these platforms gives more relevance to the role of marketing and advertising, and, consequently shifts the power back from developers to publishers and platform owners” (Feijóo, 2012: 87-88). The uncertain position of game developers towards platforms holders is seconded by our interviewees who all explicitly mention their “good standing” with Apple’s App Store employees as a competitive advantage. In addition, the mobile market in many ways leveled the playing field. Developers are less regionally dependent, but at the same time they compete against companies from all over the world. A Dutch developer explains: “The mobile market seems easy, but it is one of the most difficult markets out there. Apple took over distribution and payments, but not marketing. We all have an IT background and there is no marketing in our DNA”. The lack of non-development expertise, such as management, PR and marketing skills, is a recurring theme within the wider Dutch creative industries but in the Dutch game industry in particular (cf. Bartelson et al., 2012: 56). The majority of game graduates are specialized in game development (e.g. design, artists, audio, programming) whereas students with a deeper understanding of relevant business models and an acknowledgement of the current shift from a product-logic towards a service-model, is rare.

5. Conclusion

Around 2005 the spark in the creative engine was lit by a small but highly dedicated group of individual entrepreneurs, policy makers and academics. These game enthusiasts had a solid cultural and infrastructural basis to build on and building they did. The Dutch ecosystem, in technological, cultural and economic term is not insignificant and is growing stronger with the day. The lack of state-support during the 1990’s made the Dutch industry self-reliant. With no support system to speak off, no cultural infrastructure and no significant game-related curricula, the Dutch game industry faced the typical chicken-and-egg dilemma. No new talent meant no real growth, and no growth made universities reluctant to start game-related curricula. Heavy state support and a surprising number of industry bodies and ad-hoc networks of industry professionals turned the Dutch game industry is a highly connected and innovative ecosystem. In terms of education, challenges remain. While there are game

designers aplenty, young Dutch enterprises face headwind growing their companies because they business innovation related expertise. There is growth, but job security is non-existent, flexible positions are growing, low-paid internships reign supreme and typical fallback options common to the Dutch welfare state have fallen by the wayside.

This precarious position of young entrepreneurs underlines the point we made in our study of the European game industry: the promotion and development of the game industry ties in neatly with neoliberal policies of the nation-state in which labor is becoming more and more insecure, resulting in what is termed the rise of the Precarious Class. Under the idea of freedom and flexibility, many developers face a highly insecure present as well as future. The Dutch trade unions, being so much part of the rise of the welfare state, are notoriously absent when it comes to rethink labor rights and policies for the creative classes. The precarious class is thus alienated from the trade unions, and therefore lack collective support. There is, however, a danger to claim that flexible labor conditions are intrinsically bad. The danger is, however, that there will be a growing disjuncture between those who have secure jobs, and those who haven't, as the latter are in times of crisis more likely to be disadvantaged.

In an international comparative perspective the Dutch industry is small, agile and highly diverse. The position of The Netherlands is on several aspects comparable to Hong Kong, both are relatively small places and both have a strong outward orientation. Following the Dutch case, it seems pivotal that policy makers, academics and entrepreneurs join their forces to further develop the game industry. Whether online games or serious games can be unique selling points for Hong Kong depends on an analysis of the Asian market. What the Dutch case tells us, is that it is important to carve out a niche within the wider domain of the game industry as to remain competitive.

Bibliography

Ammelrooy, P. *Klein Duimpjes gevecht tegen de diepe zakken*. De Volkskrant. Sec. Economy. April, 13, 2004: 7.

Bogost, I. *Persuasive Games: The Expressive Power of Videogames*. Cambridge, MA: MIT Press, 2007.

Bartelson, E., M. Dierckx., E. Boshove & M. Roso. *Dutch Games Industry Survey Enquête Uitslagen*. In: Roso, E. (Ed.). Gamesmonitor '12. De Nederlandse Gamesindustrie Onderzocht. Utrecht, Taskforce Innovatie Regio Utrecht, 2012: 30-39.

Boshove, E & M. Roso. *Gamesindustrie Nederland: Samenwerking & ontwikkeling*. In: Roso, E. (Ed.). Gamesmonitor '12. De Nederlandse Gamesindustrie Onderzocht. Utrecht, Taskforce

Innovatie Regio Utrecht, 2012: 40-57.

Cornford, J., R. Naylor & S. Driver. *New media and regional development: the case of the UK computer and video games industry*. In: A. Giunta, A. Lagendijk and A. Pike, eds. *Restructuring industry and territory: the experience of Europe's regions*. London: The Stationery Office, 2000: 83-108.

Dierckx, M & E. Bartelson. *Nederlandse gamesindustrie maakt van achterstand een internationale voorsprong*. In: Roso, E. (Ed.). *Gamesmonitor '12. De Nederlandse Gamesindustrie Onderzocht*. Utrecht, Taskforce Innovatie Regio Utrecht, 2012: 58-77.

Edery, D. & E. Mollick. *Changing the Game: How Video Games Are Transforming the Future of Business*. Upper Saddle River, N.J: FT Press, 2009.

European Union. *Key figures on Europe 2012*. Luxembourg: Publications Office of the European Union, 2012.

Feijóó, C. *An exploration of the Mobile Gaming Ecosystem from Developers' perspective*. In T. Zackariasson, Peter; Wilson (Ed.), *The Video Game Industry: Formation, Present State, and Future*. New York: Routledge, 2012: 76-95.

Funnekotter, B. Wereldspeler. Game-industrie haalt razendsnel achterstand in. *NRC Handelsblad*. Sec. Economy. March 14, 2006: 14.

Glas, R. Van Pong to Playstation: De Geschiedenis Van Computerspellen. *Tijdschrift voor Mediageschiedenis*. 7 no.2 (2004): 9-30.

GOC. *Gaming in Cijfers*. Veenendaal: GOC, 2012.

Haddon, L. "Explaining Ict Consumption: The Case of the Home Computer." *Consuming Technologies: Media and Information in Domestic Spaces*. Ed. Roger Silverstone. London/New York: Routledge, 1992.

Haddon, L. *The Development of Interactive Games*. In: Mackay, H. and O'Sullivan, T. (Eds.) *The Media Reader: Continuity and Transformation*, Sage, London, 1999: 305-27.

Juul, J. *A Casual Revolution: Reinventing Video Games and Their Players*. Cambridge: MIT Press, 2010.

Kent, S. *The Ultimate History of Videogames: From Pong to Pokemon - the Story Behind the Craze That Touched Our Lives and Changed the World*. Roseville: Prisma Publishing, 2001.

Kerr, A. *The UK and Irish game industries*. In T. Zackariasson, Peter; Wilson (Ed.), *The Video Game Industry: Formation, Present State, and Future*. New York: Routledge, 2012: 116-133.

Kerr, A., & Cawley, A. The spatialisation of the digital games industry: lessons from Ireland. *International Journal of Cultural Policy*, 18, no. 4 (2012): 398-418.

Kline, S., N. Dyer-Witheyford, N., & G. De Peuter. *Digital Play: The interaction of technology, culture, and marketing*. Montreal: McGill-Queen's University Press, 2003.

Koops, O. & Bachet, T. *De Nederlandse Gamesindustrie in Cijfers*. In: Roso, E. (Ed.).

- Gamesmonitor '12. De Nederlandse Gamesindustrie Onderzocht. Utrecht, Taskforce Innovatie Regio Utrecht, 2012: 7-39.
- Montfort, N. & I. Bogost. *Racing the Beam: The Atari Video Computer System*. Platform Studies. Cambridge: MIT Press, 2009.
- O'Donnell, C. This is Not a Software Industry. In T. Zackariasson, Peter; Wilson (Ed.), *The Video Game Industry: Formation, Present State, and Future*. New York: Routledge, 2012a: 17-33.
- O'Donnell, C. *The North American Game Industry*. In T. Zackariasson, Peter; Wilson (Ed.), *The Video Game Industry: Formation, Present State, and Future*. New York: Routledge, 2012b: 99-115.
- Poole, S. *Trigger Happy: The Inner Life of Videogames*. London: Fourth Estate, 2000.
- Nieborg, D.B. 2011. *Triple-A: The Political Economy of the Blockbuster Video Game*. PhD-thesis. Amsterdam: University of Amsterdam.
- PWC. *Global entertainment and media outlook: 2012–2016*. Amsterdam: PWC, 2012.
- Sandqvist, U. The Development of the Swedish game industry: A true success story? In T. Zackariasson, Peter; Wilson (Ed.), *The Video Game Industry: Formation, Present State, and Future*. New York: Routledge, 2012: 134–153.
- Schermer, B.W., R. Marbus., R. Gerding., & S. van Kesteren. *Gaming: Meer dan een spelletje*. Leidschendam: ECP.NL, Platform voor eNederland, 2008.
- Wade, A. *The State of the Art: Western Modes of Videogame Production*. In: *Situated Play, Proceedings of DiGRA 2007 Conference*. Vancouver: DiGRA, 2007: 682-691.
- Whalen, Zach and Laurie N Taylor, ed. *Playing the Past: History and Nostalgia in Video Games*. Nashville: Vanderbilt University Press, 2008.
- Williams, Dmitri. "Structure and Competition in the U.S. Home Video Game Industry." *The International Journal on Media Management* 4.1 (2002): 41-54.
- Wolf, Mark J.P. *The Video Game Explosion: A History from Pong to Playstation and Beyond*. Westport: Greenwood Press, 2008.
- Zyda, M. From Visual Simulation to Virtual Reality to Games. 2005. USC Viterbi School of Engineering. Available: <http://www.isi.edu/GamePipe/Publications.html>. March 23, 2005.