
THE NETHERLANDS
GAMES
MONITOR
2022

colophon

TEXT AND ANALYSIS
Dutch Game Garden
Christel van Grinsven
NEO Observatory
Walter Manshanden

PROOFREADING AND GENERAL SUPPORT
Marilla Valente

RESEARCH, EDITING AND SUPPORT
Dutch Game Garden
Janine van de Kaa
Krista Hendriks
Aryeh Loeb
JP van Seventer
Denice Zheng

DESIGN
Studio Vrijdag

COVER IMAGE
Horizon Forbidden West
by Guerrilla Games

SPECIAL THANKS TO
Newzoo

PARTNERS
Dutch Games Association
Video Game Federatie Nederland

This publication is made possible with the support of Province of Utrecht, Gemeente Utrecht, HKU: University of the Arts Utrecht, Breda University of Applied Sciences (BUAS), Hanze University of Applied Sciences Groningen (Hanze Hogeschool Groningen), Saxion (University of Applied Sciences) and Rotterdam University of Applied Sciences (Hogeschool Rotterdam).

THE NETHERLANDS GAMES MONITOR 2022

table of contents


Hacken?
Ja

Introduction

We are honored to present The Games Monitor 2022 edition with the facts, figures, trends and developments in the Dutch games industry. The Games Monitor was first published in 2012 and was followed by new research in 2015 and 2018. After a COVID-19 impact report in 2021, we are now able to provide a full version of the monitor again. Please note that this report focuses on data about the Dutch Games industry until 2021. Most of the research and analysis was carried out in 2022. Newer developments in 2023 and the beginning of 2024 have not been taken into account.

An extensive survey was sent out to over 500 game companies at the beginning of 2022 and almost 200 companies filled out the survey. The results of this survey and additional desk research, interviews and a roundtable discussion, were presented on October 6th, 2022 at The Dutch Game Day in Hilversum.

Chapter 1 introduces the facts and figures of the Dutch games industry. Chapter 2 focuses on financial growth, funding strategies and the growth challenges game companies face. Chapter 3 provides more specific information about trends and developments in entertainment games, while chapter 4 looks into applied or serious games. Chapter 5 focuses on gaining insight into Dutch game education: the programs, courses, and students. In chapter 6 some insights are provided about the broader impacts of the games industry.

We hope that this version of the Games Monitor again is valuable and provides better insight into the Dutch game industry. We are looking forward to having continued conversations and discussions about the growth and development of the Dutch Games industry.

We sincerely thank everybody who has contributed to this Games Monitor!

Traffic Jams – Little Chicken

MANAGEMENT SUMMARY

The Games Monitor 2022 presents a comprehensive overview of the Dutch video games industry between 2018 and 2021. This is the fourth full edition with an aim to provide the most relevant comparisons and updates in the industry. This overview consists of desk research, informal discussions, roundtable sessions, and a survey sent to approximately 500 companies with a response of almost 200.

DEFINITION OF THE GAMES INDUSTRY

The games industry is defined as all companies whose core activities include at least one of the following processes in the value chain: development, production, publication, facilitation, and/or electronic distribution of electronic games.
As a consequence, many currently active organizations in the games industry (clients, educational institutions, research institutes) were excluded from our analyses as the development of games is not their core business.
The Games Monitor focuses on two domains in the games industry: entertainment games and applied games. Entertainment games entail all electronic games that have entertainment as their primary goal. Applied games, also referred to as serious games, aim to inform, educate or train end-users. Applied games are developed and distributed in many sectors, including education, healthcare, and training.

COMPANIES, JOBS AND TURNOVER

The Dutch games industry has grown significantly in the last three years, consisting of 630 companies as of the end of 2021. Dutch game companies benefited from the growth of the global games market. Growth in revenue of almost 18% annually on average for Dutch game companies (to €420-440 million in 2021) surpasses the global average in the industry. The number of jobs also increased by more than 5% annually to 4560 jobs. The growth in the number of jobs is particularly visible in larger companies with over 50 employees.

Furthermore, figures for the past ten years show an evolution in terms of accumulated growth for the entire Dutch games industry. Initially, the sector increased mainly in the number of companies. Between 2015 and 2018, growth was visible in terms of the number of employees, with the most noticeable increase in revenue during the last three years. This indicates that the Dutch games industry is on the road to maturity.

SIZE OF COMPANIES

The average size of a company in the games industry is 7.2 employees per company. This is due to the large number of self-employed and small companies and the limited number of large game companies in the Netherlands. The 2021 distribution of employees for larger companies (more than 50 employees) has more than doubled in the past three years. These companies are the Dutch games industry scale-ups and in the past three years have increased from 6 to 12 companies.

REGIONAL HIGHLIGHTS

The largest number of jobs in the Dutch games industry can be found in the Greater Amsterdam region (including Schiphol). As the second largest region in terms of employment, Utrecht has the largest number of jobs in applied or serious game companies. Greater Rotterdam, South East North Brabant (including Eindhoven and Valkenswaard), and Greater The Hague complete the top 5 of the Dutch game regions. Smaller clusters can be found in the Delft Region, West North Brabant (Breda, Etten-Leur, and Tilburg), Twente (the region around Enschede), and North Friesland (Leeuwarden).

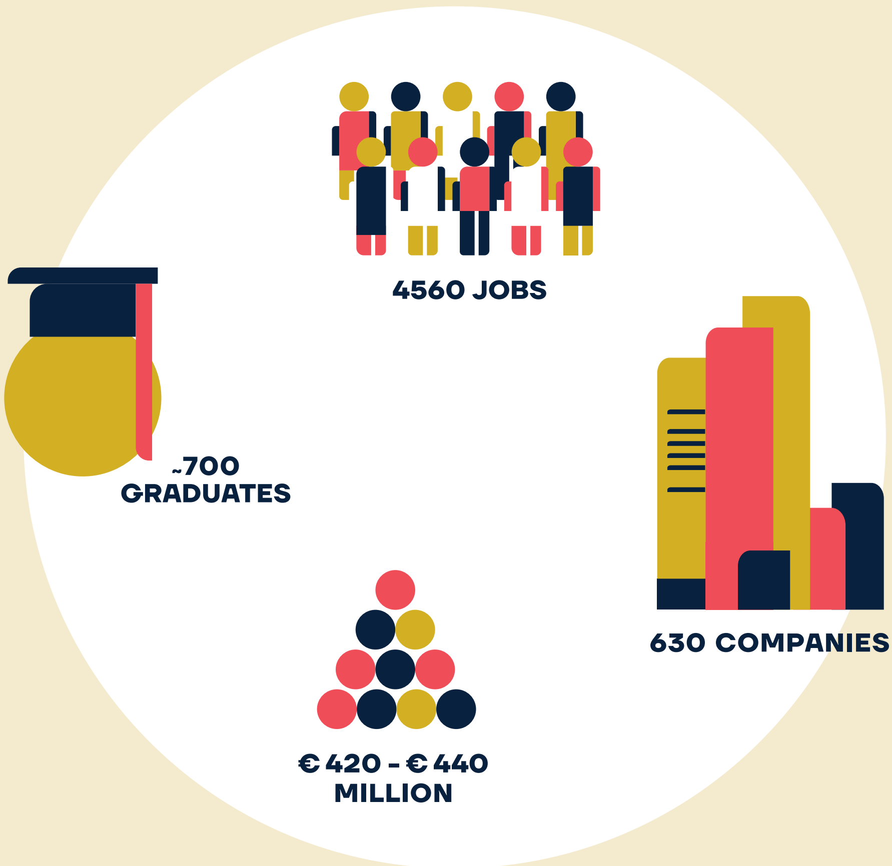
GROWTH

The Dutch games industry is showing a rapid growth in reported revenue. Mostly larger and more experienced companies have done extremely well in the past three years, as well as some solo developers and small companies that show a high revenue per person. The

FIGURE I

KEY FACTS & FIGURES DUTCH VIDEO GAME INDUSTRY

(Source: Games Monitor 2022)



period 2020-2022 was also characterized by a growth in the number of external investments, mergers, and acquisitions. Companies show more maturity in the growth or scale-up challenges they face.

Compared to the 2018 Games Monitor, the total number of game companies increased by 55 companies. Both entertainment games and applied games companies show a growth in the number of employees, however entertainment companies are the top employers. Due to the effects of the COVID-19 pandemic, applied game companies have grown less rapidly than entertainment companies.

ENTERTAINMENT GAMES

While PC is the most popular platform among Dutch developers and Steam is the most popular distribution channel, entertainment games show a large variety in how they develop their games. Dutch game developers use a multi-platform, multi-distribution, and multi-monetization strategy for game development. Growth is expected for many segments.

APPLIED GAMES

From an international perspective, applied games have a strong foothold in the Dutch games industry. Around a quarter of Dutch game companies are involved in the development of applied games. The number of applied game companies increased from a total of 114 in 2018, to 151 applied game companies focusing exclusively on applied games, with an additional 24 companies developing both applied and entertainment games.

When we look at clients in the applied games industry, healthcare and education are still the largest market segments for applied game companies. The work-for-hire model remains an often-used business model amongst applied game studios. On average applied game companies worked on 15 projects per company in 2021. The number of companies that focus on a specific product or service is slowly increasing. Furthermore, we see more applied game companies who have expanded their operations abroad.

GAME EDUCATION

The number of game education studies in 2021 is 44, and there are 23 game-related minors and courses. This is a decrease compared to 2018. The outflow of students that enter the labor market or start their own company is approximately 700 in 2020, which is less than in 2018 (approximately 900), due to the lower number of programs. This number consists solely of the number of graduates from full-time game-related educational programs. There has been a notable shift in the vocational education sector where game education is now part of a broader program, such as Software Development or Multimedia Design.

DIVERSITY AND INCLUSION

There is a growing awareness of the importance of diversity and inclusion in the games industry. The survey provided insights into gender, age, foreign talent, and policy measures. The percentage of women in game companies has risen steadily over the past few years to 23% in 2021, as has non-binary, gender fluid,and transgender. The average age of industry professionals is also increasing.

Arid – Sad Viscacha Studio (Breda University of Applied Games)

1.

FACTS & FIGURES

This chapter provides an overview of recent developments in the size, segmentation, and growth of the Dutch games industry. This chapter is based on desk research and data from the Games Monitor Survey, executed in 2022. Around 200 companies participated in the survey. Comparison with previous editions of the Games Monitor allows for further insights into trends and developments.
The same definitions and methodologies as the previous editions of the Games Monitor (2018, 2015, 2012), were used. A more detailed description of the data and research methodology is provided in the Appendix.

The Dutch games industry has grown significantly between 2018 and 2021. Dutch game companies benefited from the growth of the global games market. Figure 1.1 shows an evolution in the growth cycle in the past ten years. From 2011-2015 the growth pattern was volatile. The growth of the industry was caused by the net growth of starting and quitting companies. The Games Monitor 2015 [1] showed rapid growth in companies but only limited growth in employment and revenue. In the period between 2015-2018, growth accelerated to an average job increase of 10 percent per year, as was shown in the Games Monitor 2018.[2] This trend of growth within existing game companies is even more prominent for the period between 2018 and 2021. Growth in employment (5.7%) and revenue (17.9%) is far exceeding company growth (see Figure 1.1). This growth pattern shows that the Dutch games industry is on the road to maturity.

1.1 KEY ECONOMIC INDICATORS

The Dutch games industry consists of 630 companies and 4,560 jobs by the end of 2021. They report a total revenue of approximately €420-440 million in 2021. Compared to 2018, this is a growth of 55 companies, more than 700 jobs, and more than €150 million in revenues. The Games Monitor focuses on the direct economic impact of the *development and production* of games in the Netherlands. The overall economic and societal impact of games, including indirect impacts and impacts from the consumption of games is much higher (see Chapter 6).

Overall, the average size of a company in the games industry is 7.2 employees per company. The sector consists of a large number of self-employed and small companies and a limited number of large game companies. However, if we look at the distribution of employees based on the size of the companies (see Figure 1.2), we see a growth in the number of employees working for larger companies.

Especially the number of people working for companies with more than 50 employees has more than doubled in the past three years. These companies can be defined as scale-ups. The number of companies in this category has risen from 6 to 12 companies between 2018 and 2021. Companies that show this growth, often have received funding to scale up and grow their business faster. The number of small companies (freelancers and solo developers) further increased as well, but not as rapidly as during the previous period.

In terms of company size, game companies show a different trend than the ICT sector and the creative industries, of which games are a part. Both the creative and ICT sectors show growth in small-sized companies but a decline in the average number of employees per company. Job growth for most of the creative sectors between 2010 and 2020 was almost entirely realized by micro-sized companies. For the ICT sector, growth was also realized in companies in the category of 50-100 employees. The average size of companies in the creative industries is less than two employees; ICT companies had an average of 4.1 in 2020. The average number of employees in the games industry is even higher than the average of 5 employees per company for the entire Dutch economy.[3]

1.2 COMPANY AGE

In this edition of the Games Monitor, we are able to present the age distribution of the game companies in our database. We gathered data on the year of foundation for all the companies that are still active in 2021. Note that the year of foundation for the first entity is taken as the starting point. Companies that have changed the form of their business registration (for instance from a self-employed entity ("eenmanszaak") to a private limited company ("BV")), often operate under the same name or have the same portfolio of games. They still are the same company, so that is why the year of foundation for the first entity is counted.

Figure 1.3 illustrates that the majority of game companies have hit the 7-year mark. It can be assumed that game development companies with more than 3 years of experience have already released a game and passed through the first challenging phases of entrepreneurship. Game development companies that have existed for more than 6 years, in general, have shown that they can be a sustainable company. It is a good sign that so many companies already celebrated their 6th birthday, as it shows that the Dutch games industry is maturing. The largest potential for scaling up comes from the range of companies with 4 to 12 years of experience.

Early-stage startups with less than 3 years of experience are more volatile, as they consist of many startups that have not yet released a game or some that have yet to discover whether they want to be an entrepreneur.

FIGURE 1.1

GROWTH OF THE DUTCH GAMES INDUSTRY

IN NUMBER OF COMPANIES, JOBS, AND REVENUE (2011-2015, 2015-2018, 2018-2021), GROWTH IN PERCENT PER YEAR.

Source: NEO Observatory, based on data from Dutch Game Garden/LISA/CBS and Games Monitor 2015 and 2018

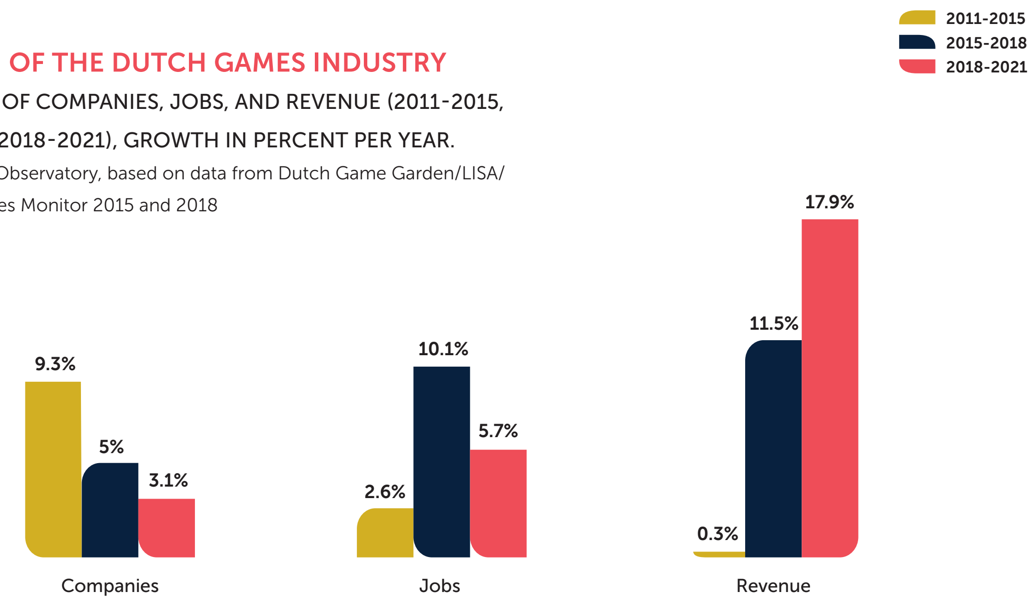


FIGURE 1.2

NUMBER OF EMPLOYEES PER COMPANY SIZE

Source: NEO Observatory, based on data from Dutch Game Garden/LISA/CBS and Games Monitor 2015 and 2018

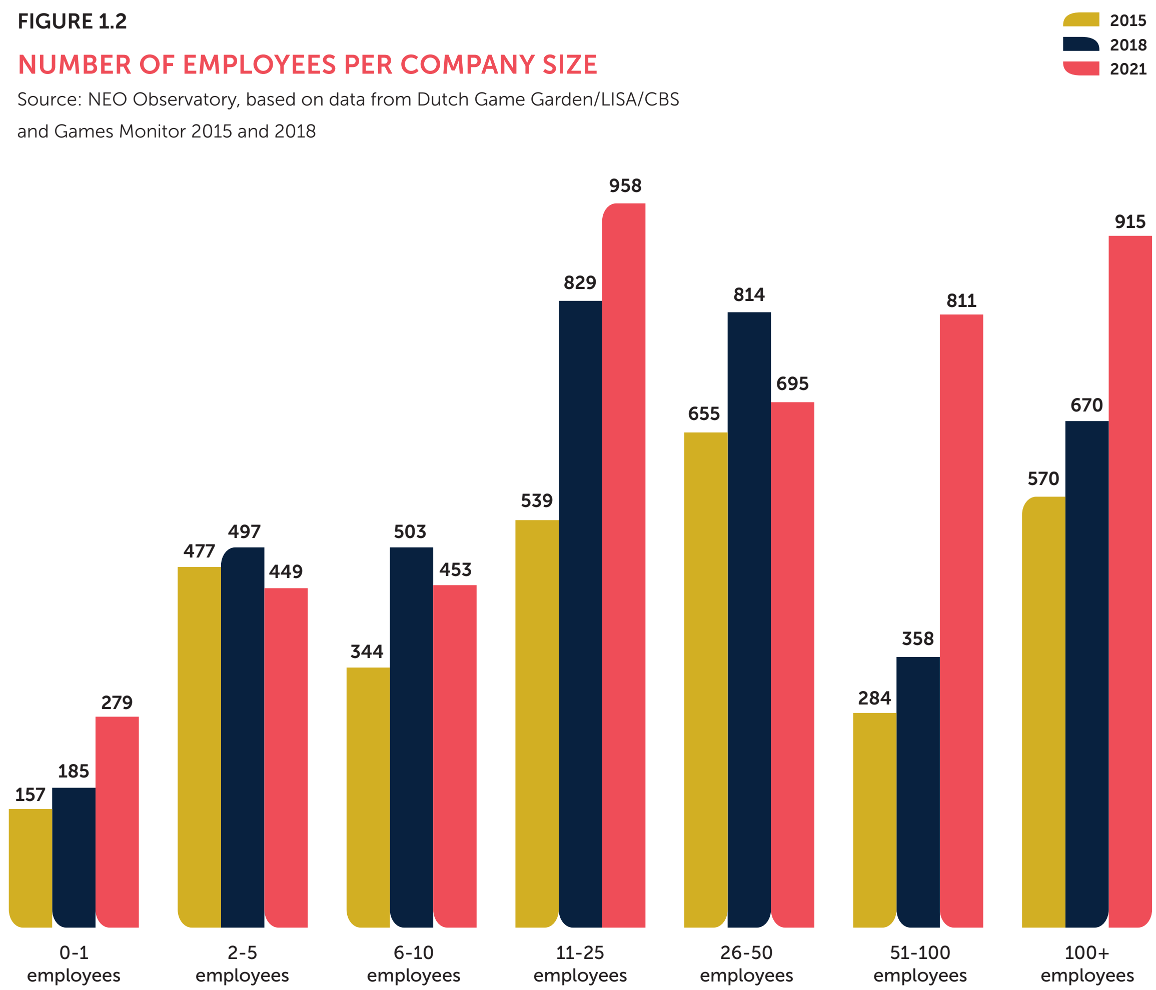
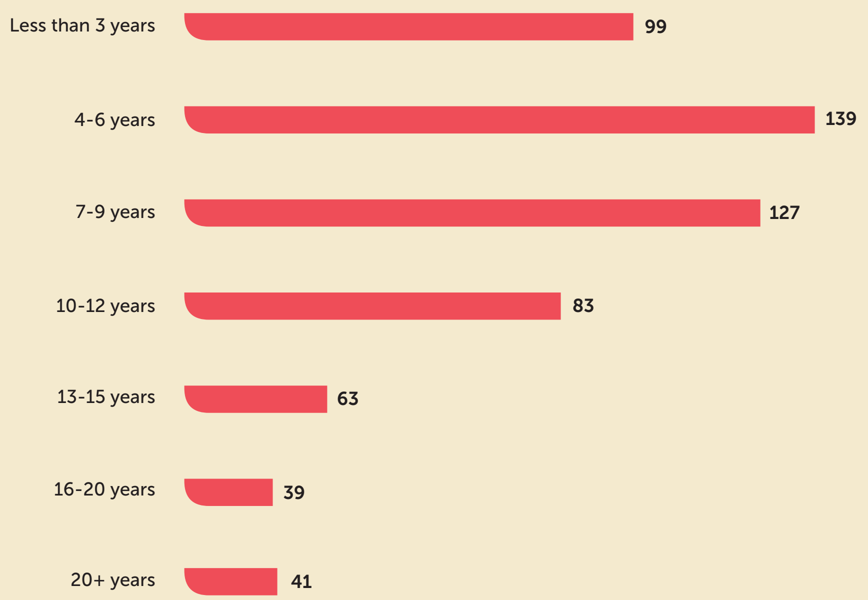


FIGURE 1.3

COMPANY AGE, BASED ON YEAR OF FOUNDATION FIRST ENTITY

Source: Dutch Game Garden, based on data from Chamber of Commerce



1.3 SPECIALIZATION OF GAME COMPANIES

By the end of 2021, we counted 198 game developers focusing on entertainment games, and another 12 companies combined the development of their own entertainment games with publishing third-party games. Together these 210 companies employ 2,154 people which makes entertainment game companies the top employer (almost half of the total games industry), in the Netherlands. The number of game developers focusing on entertainment games has stabilized compared to 2018, and the number of jobs increased considerably.

In the previous edition of the Games Monitor, data illustrating growth in the number of game developers was driven by the growth of entertainment game companies. This number has declined slightly. The number of game companies that are active in both entertainment and applied games has de-creased as well. Applied game companies in contrast show a growth from 114 to 151 companies. This is remarkable considering the challenges applied game companies faced during the COVID-19 pandemic.[4]
A few reasons might explain the growth in applied game companies. As depicted in Figure 1.4 the category 'both' has decreased. This is caused by several companies that have chosen to specialize and focus solely on applied games. Another reason is that we have added several companies to our list that have existed for a while, but have made a shift to applied games from a different industry, most notably from a consultancy background. We have also added some companies to the database that were established in previous years but only recently came to our attention.

TABLE 1.1

NUMBER OF GAME COMPANIES AND JOBS BY SPECIALIZATION

(Source: Dutch Game Garden)

FOCUS	No. of companies	Jobs
Applied	151	1302
Applied & Entertainment	24	145
Entertainment	198	1933
Entertainment & Publishing	12	221
Publishing	30	306
Service	60	518
Specialized subcontractor	116	135

FIGURE 1.4

NUMBER OF GAME DEVELOPERS BY SPECIALIZATION, IN 2012, 2015, 2018 AND 2021

(Source: Games Monitor 2012-2022)

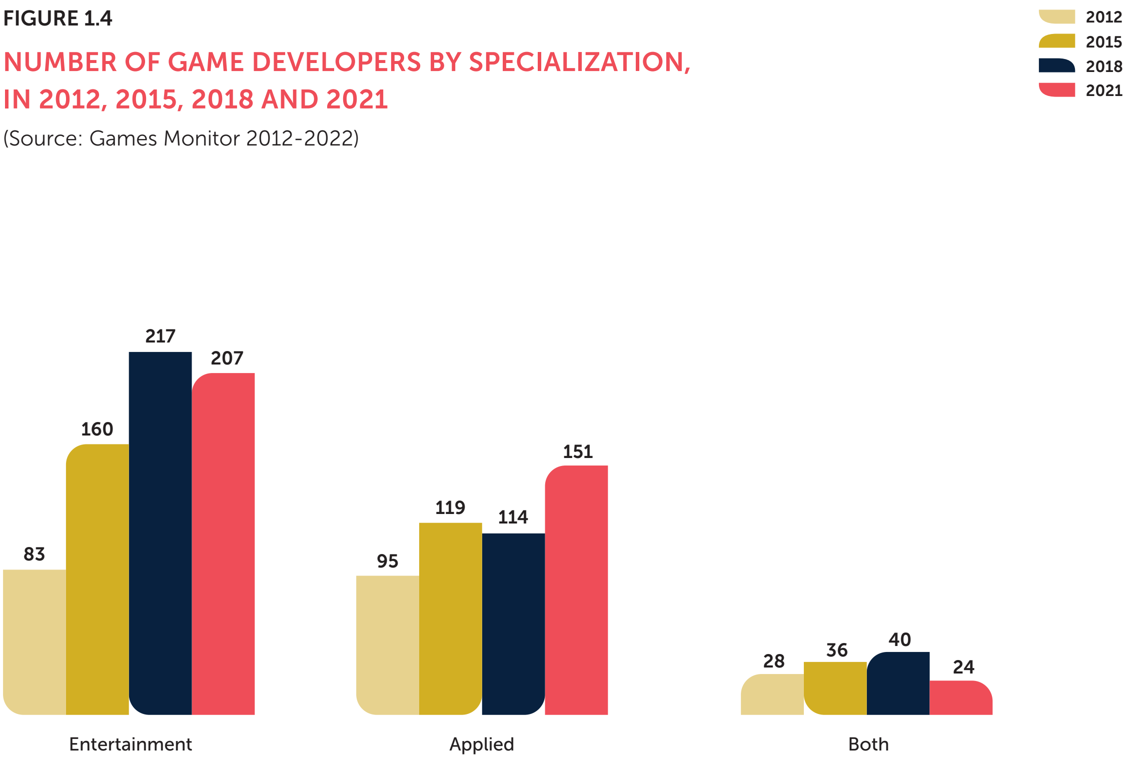
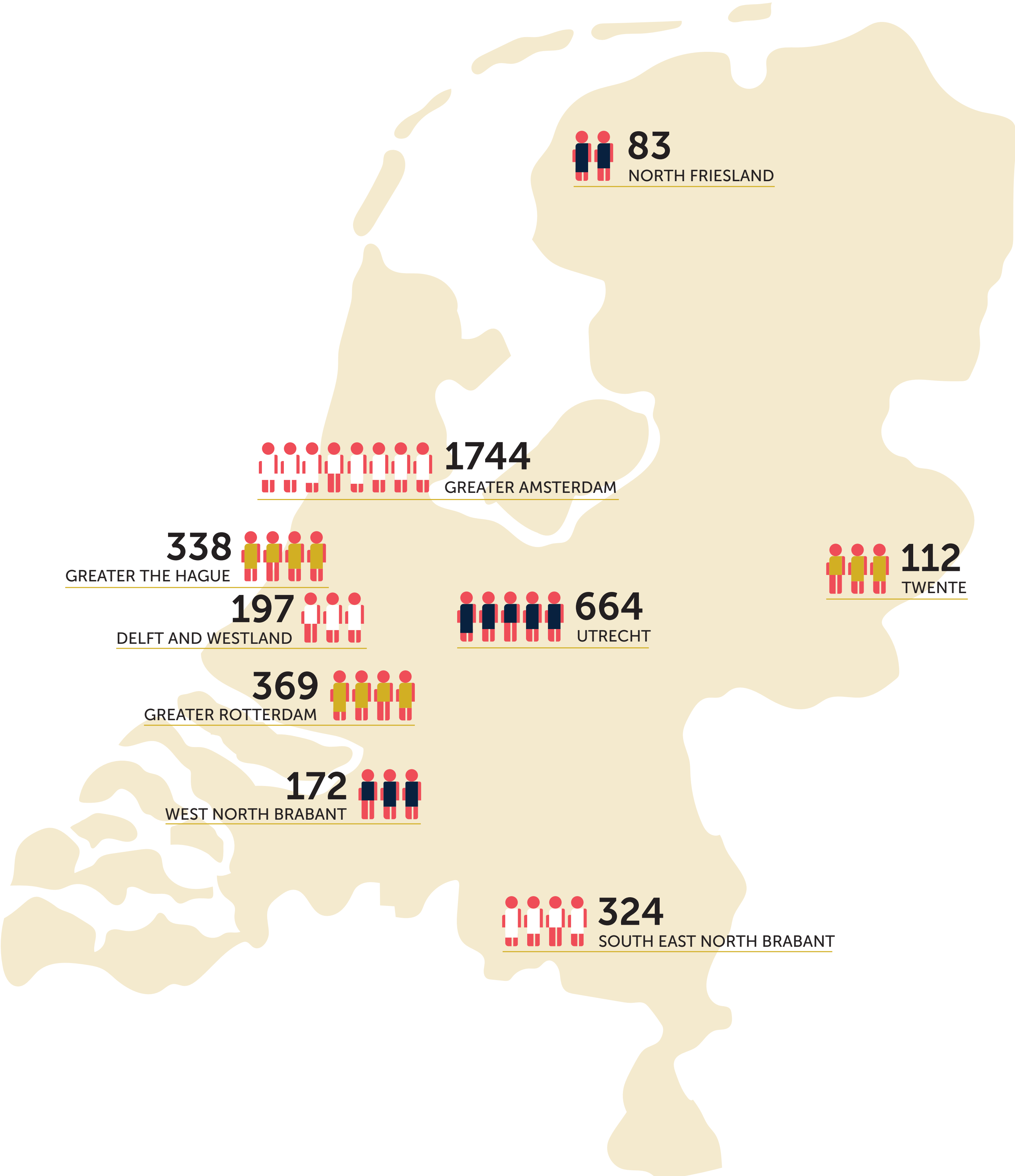


FIGURE 1.5

NUMBER OF EMPLOYEES PER COROP REGION

Source: NEO Observatory, based on data from Dutch Game Garden/LISA/CBS



1.4 REGIONAL HIGHLIGHTS

The greater Amsterdam region is the region with the largest number of game companies and employees in game development in the Netherlands (see Figure 1.5). More than 1,700 jobs can be found here and several of the largest Dutch game companies call the Amsterdam region their home. Guerrilla Games and Azerion, the two companies with the largest number of employees are, respectively, located in the city center and close to Schiphol airport. PUBG Amsterdam is one of the fastest-growing companies in the region, they started their Amsterdam branch in 2018 and have grown to more than 100 employees. Their spin-off PLAYER UNKNOWN Productions is also growing. Vertigo Amsterdam (formerly ForceField VR), Newzoo, and Cliq are other large companies in Amsterdam. The trend that large international game studios choose to settle in the Amsterdam region has developed further in the past years. Bungie, EPIC Games, Gearbox Publishing, and Pearl Abyss are some of the companies that have done so.

Utrecht is the second games industry hub of the Netherlands and hosts many medium-sized and small game companies, both in entertainment and applied games. The largest game companies in Utrecht are Nixxes, Tover (formerly Active Cues), and 5CA. In comparison with Amsterdam, game development in Utrecht is more focused on applied games. Overall, the Utrecht region has the most applied game jobs of all regions in the Netherlands: 295.

Greater Rotterdam, South East North Brabant (including Eindhoven and Valkenswaard), and Greater The Hague complete the top 5 of Dutch game regions with 300+ jobs in 2021. Rotterdam has a specialization in applied games with companies like Le Quest, VSTEP, and &Ranj. Internationally acclaimed VR for entertainment games company Vertigo Games is also located in Rotterdam.

The Eindhoven region has a mixed profile of companies like Abstraction, Gamehouse, Chimpworks, and Games for Health as noticeable companies in that region. The Hague hosts mainly entertainment game companies, such as Gamepoint and Paladin Studios.

In contrast with 2018, the region around Hilversum is not on the map anymore. The largest company in Hilversum, Spil Games, was acquired by Azerion and moved to the Amsterdam region.

Smaller clusters can be found in the Delft Region, West North Brabant (Breda, Etten-Leur, and Tilburg), Twente (the region around Enschede), and North Friesland (Leeuwarden).

Notes

1. Dutch Game Garden (2016), Games Monitor The Netherlands 2015, Utrecht: Dutch Game Garden Can be retrieved from: http://www.dutchgamegarden.nl/project/games-monitor/
2. Dutch Game Garden (2019), Games Monitor The Netherlands 2018, Utrecht: Dutch Game Garden. Can be retrieved from: http://www.dutchgamegarden.nl/project/games-monitor/
3. Media Perspectives (2021), Monitor Creatieve Industrie 2021, Hilversum: Media Perspectives. Can be retrieved from: http://mediaperspectives.nl/project/monitor-creatieve-industrie/
4. For more information, see the Games Monitor 2020 Update about the impact of the COVID-pandemic. http://drive.google.com/file/d/1IBZKIBonGyEA9ph3gMjIoR-LD0xFMfNW_/view

intermezzo

DIVERSITY AND INCLUSION

In the past, video games were seen by the general public and targeted as 'toys for boys'. Nowadays, video games reach a very broad audience, showing an almost equal distribution between male and female players, and aims at being more representative for all types of players. Careers in the games industry are becoming more diverse as well. However, the transition to a more diverse workforce is not a fast one.

Gender distribution has been a focal point for a number of years. In the 2012 edition of the Games Monitor, the percentage of women in game companies was estimated to be 13,5%. This percentage has risen steadily over the years to 23% of the employees in 2021 (see Figure I). The current student population is also becoming more diverse which could shift the gender distribution in the future.

As a general development, more women are taking up management positions as well. In the past years, several larger game companies appointed women as their new CEO. Based on the responses in the survey [1], the number of people identifying as non-binary seems very low. In practice, we see a growing awareness of this topic. It is hard to translate into actual numbers, but we see that the amount of people (employees and students) in the games industry identifying as non-binary, genderqueer, gender-fluid, or transgender is increasing.

As the video games industry is maturing we see that the average employee age is rising. The industry is still very young but the number of veterans is growing. See Figure II for the age distribution within the Dutch games industry.

The number of foreign employees in the Dutch games industry is rising. Sometimes because talent for certain positions is hard to find within the Netherlands, other companies specifically look for foreign talent for (marketing) positions where knowledge of a specific language is necessary. Larger game companies all have a mix of nationalities in their teams. The number of companies founded by expats is also growing.

Many more aspects around diversity could be taken into account, but not all aspects can be measured, for instance, due to privacy laws.

FIGURE I

GENDER DISTRIBUTION OF GAME COMPANIES

(Source: Games Monitor survey 2022)

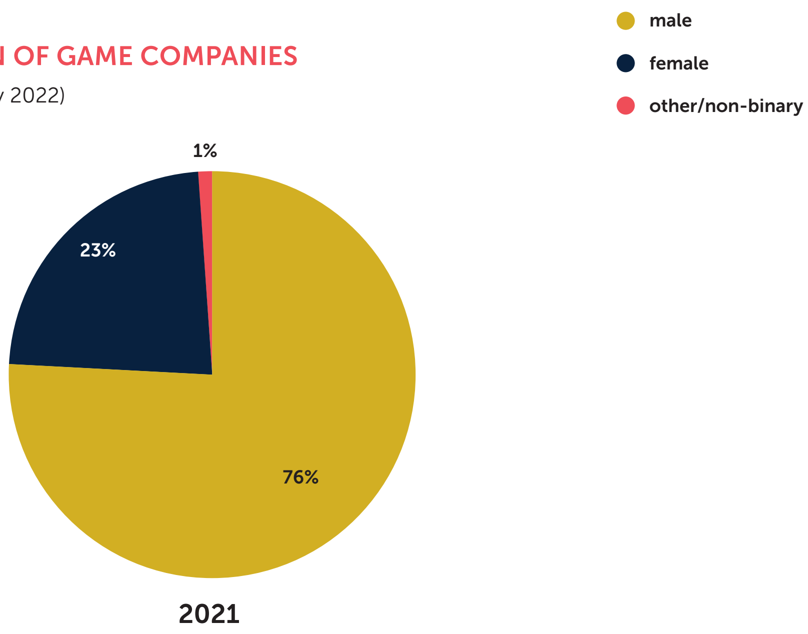


FIGURE II

AGE DISTRIBUTION OF EMPLOYEES IN THE DUTCH GAMES INDUSTRY

(Source: Games Monitor survey 2022)

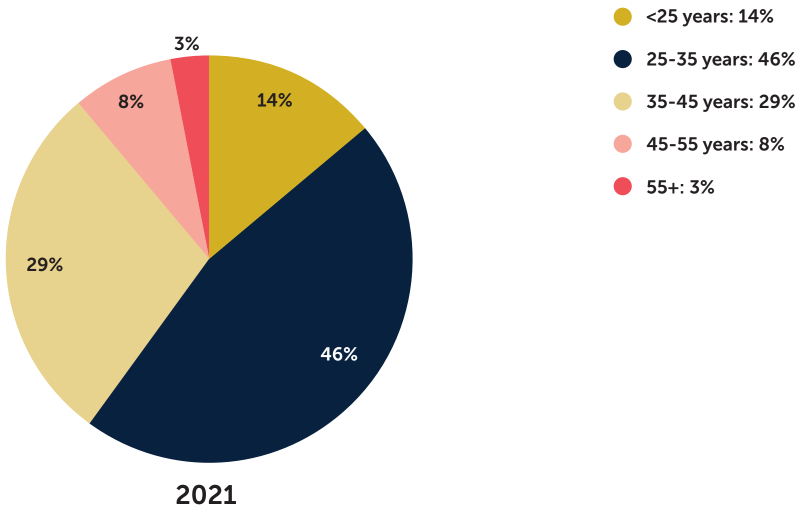
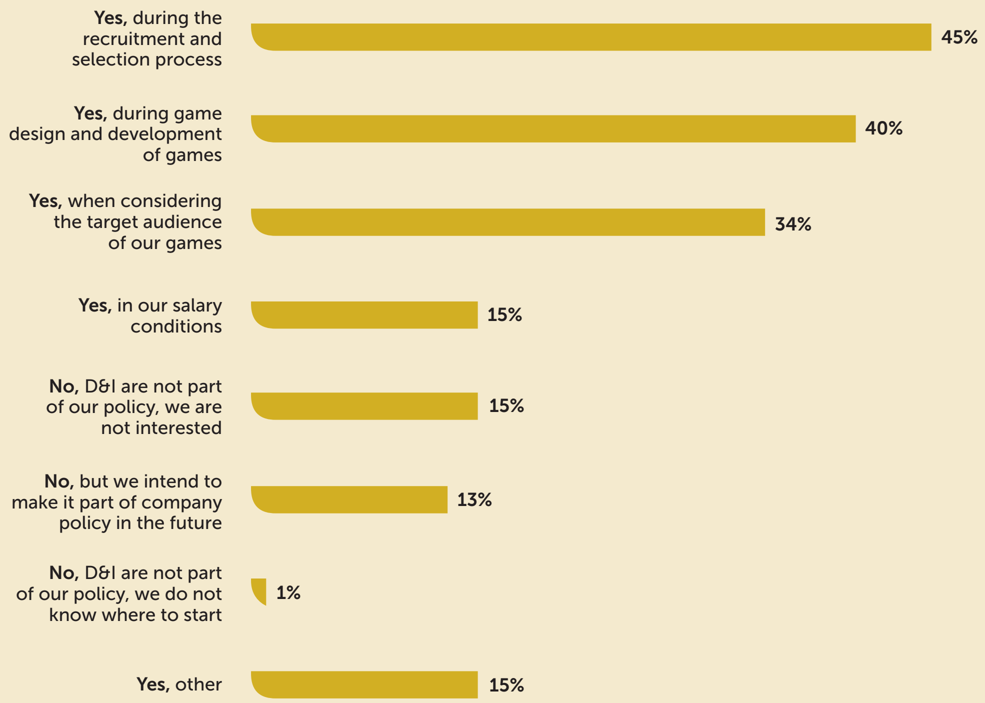


FIGURE III

DIVERSITY & INCLUSION

(Source: Games Monitor survey 2022)



PERSPECTIVES ON DIVERSITY AND INCLUSION

In the past few years, there has been a growing awareness about the topic of diversity and inclusion in the Dutch games industry. At the Dutch Game Awards, for instance, a new category has been added to honor an organization or person who has had a positive impact on this topic.

In our survey, we have asked our respondents if diversity and inclusivity is part of their company policy. The question was aimed at two policy types: on the one hand internal policies around recruitment and personnel policies, and on the other hand in the games and game development processes. The answers (see Figure III) show a lot of differences between companies. Forty-five percent of respondents state that diversity and inclusivity is part of the recruitment and selection process and 40% apply diversity during the game design and development of games. Fifteen percent of the respondents however, are not interested in the topic, and 13% do not have any policies at the moment but are intending to make it part of their company policies in the future.

There are substantial differences in terms of perspectives and opinions shared by one-person companies/freelancers. Some state that since they don't have any personnel the topic is not relevant for them. Others indicate that the topic is highly relevant for them: policies or games of potential clients are a contributing factor in terms of whether they decide to collaborate together.

Although awareness of this topic has been growing within the past few years, in some informal discussions and a roundtable organized by the Dutch Games Association in February 2022, we noticed that not all aspects of inclusivity are equally well known. For instance, how to level the playing field in terms of salary was a topic which many were interested in acquiring more tools and applicable knowledge.

Push your family – Meteor Mug

Notes

1 Please note that the survey was sent to one person per company, so people didn't answer this question for themselves.

After the Fall – Vertigo Games

FINANCE & GROWTH

The maturity of the industry, as noted in the Facts and Figures section, is also reflected in the financial situation and investment climate. Many of the questions in the Games Monitor Survey are about topics related to financial well-being, growth opportunities, and challenges. In this chapter, we take a look at these questions.

2.1 REVENUES

In Chapter One: Facts and Figures, an annual revenue of €420 – €440 million euros in 2021 was reported for the Dutch games industry. The revenue as a whole has grown almost 18% annually between 2018 and 2021. In the survey companies also reported their individual revenue for 2021.

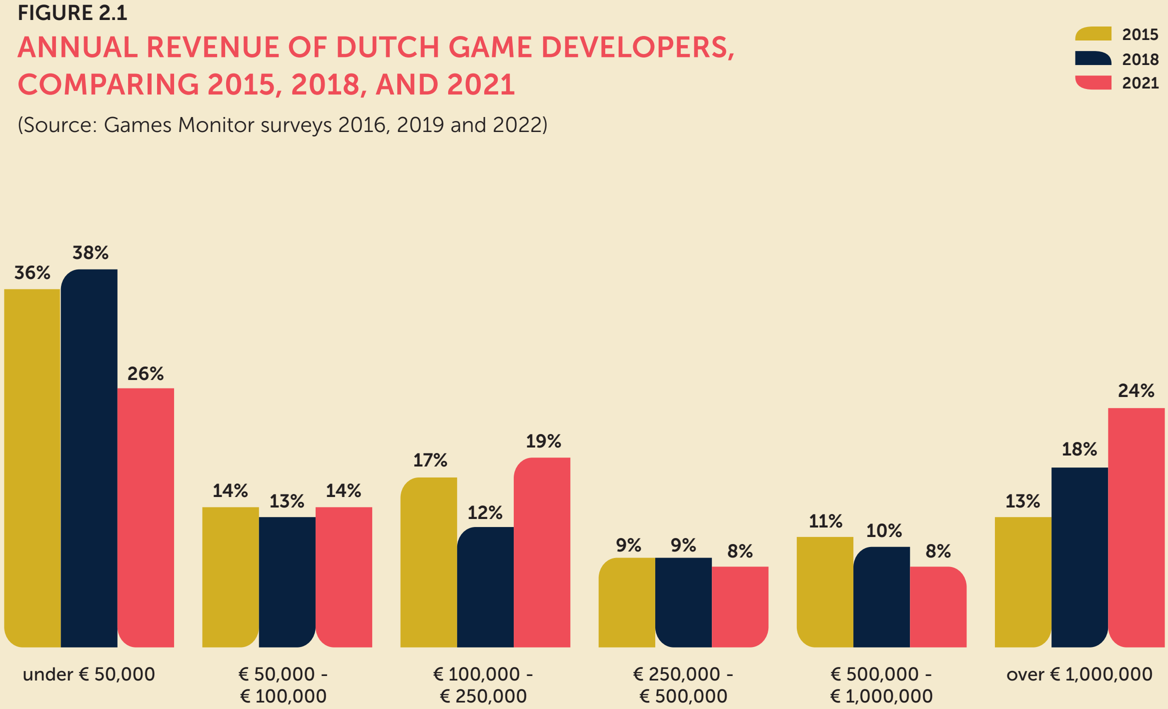
Figure 2.1 illustrates some notable changes in the reported revenues. The percentage of companies with a revenue of more than €1,000,000 has grown from 18% in 2018 to 24% of the companies in 2021. This growth is in line with the combined revenues.

In the survey, revenues above 1 million euro were specified in more detail. Forty-five percent reported a revenue between €1,000,000 and €2,500,000, 20% between €2,500,000 and €5,000,000, and 35% were equally divided between the €5,000,000 and €10,000,000 and above €10,000,000 categories. In the next edition of this report, a more extensive analysis can be made.

FIGURE 2.1

ANNUAL REVENUE OF DUTCH GAME DEVELOPERS, COMPARING 2015, 2018, AND 2021

(Source: Games Monitor surveys 2016, 2019 and 2022)



Another change that should be mentioned is a decline in the percentage of companies that have a revenue below €50,000. In the past, the growth of (small) companies translated into the growth of companies with low revenues. Obviously, there is still a large number of recent startups without any notable revenue and some self-employed, one-person companies that are part of this category. But the group of small companies in general is generating a larger revenue. This can be seen in the growth of companies with a revenue between €100,000 and €250,000 (12% in 2018 to 19% in 2021).

All-in-all, the Dutch games industry is showing a large growth in reported revenue. On a company level, there are still large differences between companies. Mostly larger and more experienced companies have done extremely well in the past three years, as well as some solo developers and small companies that show a high revenue per person. On the other hand, there is still a group of companies struggling to make ends meet. A small group of 11% reported a decrease in game-related revenue of their company.

2.2 FUNDING STRATEGIES AND INVESTMENT

Since the first edition of the Games Monitor report in 2012, data concerning funding has been part of the surveys we sent to developers. Over the years, the percentage of companies interested in growth has remained stable (77% in 2021, compared to 78% in 2018). In contrast, attitudes towards potential forms of funding have changed (see Figure 2.2). External funding, specifically a private investment (Angel investor or Venture Capital), has slowly become more interesting for developers: less than 20% in 2012 and more than 40% of the companies in 2021 cited private investment as an option to finance their ambitions for growth. The interest in funding by a publisher is also growing; thirty-three percent of the respondents stated they are interested in this type of funding. A private loan construction, which is offered by the Dutch initiative Midgame Fund[1], for example, was added as a new category. Fourteen percent of the respondents indicated that they are interested in this type of funding.

Young companies (less than 5 years old) are also more interested in external funding than in the past. Compared to more experienced companies, young companies are open to exploring many different options (multiple options were chosen in the survey). Interest in private investments or funding by a publisher score highest among young companies, (both more than 40% of this group of companies). They also are interested in opportunities a private loan has to offer, such as the Midgame Fund (30% of the young companies), compared to the more experienced companies (7% of companies that have been in business longer than 10 years). Apart from the general shift in funding preferences, one specific explanation for the interest in external funding for young companies can be found in the characteristics of the founder(s). In the last few years, we have seen a growth in the number of startups with an experienced founder. Some of them were co-founders in another company (for example Ronimo Games or Little Chicken) but have decided to pursue their own dreams. Others were employees in a company but now have decided to branch out and develop their own games. Some are expats relocating to the Netherlands and are starting their own company here.

FIGURE 2.2
TYPE OF FUNDING TO FINANCE GROWTH (MULTIPLE ANSWERS POSSIBLE)
(Source: Games Monitor surveys 2016, 2019 and 2022)

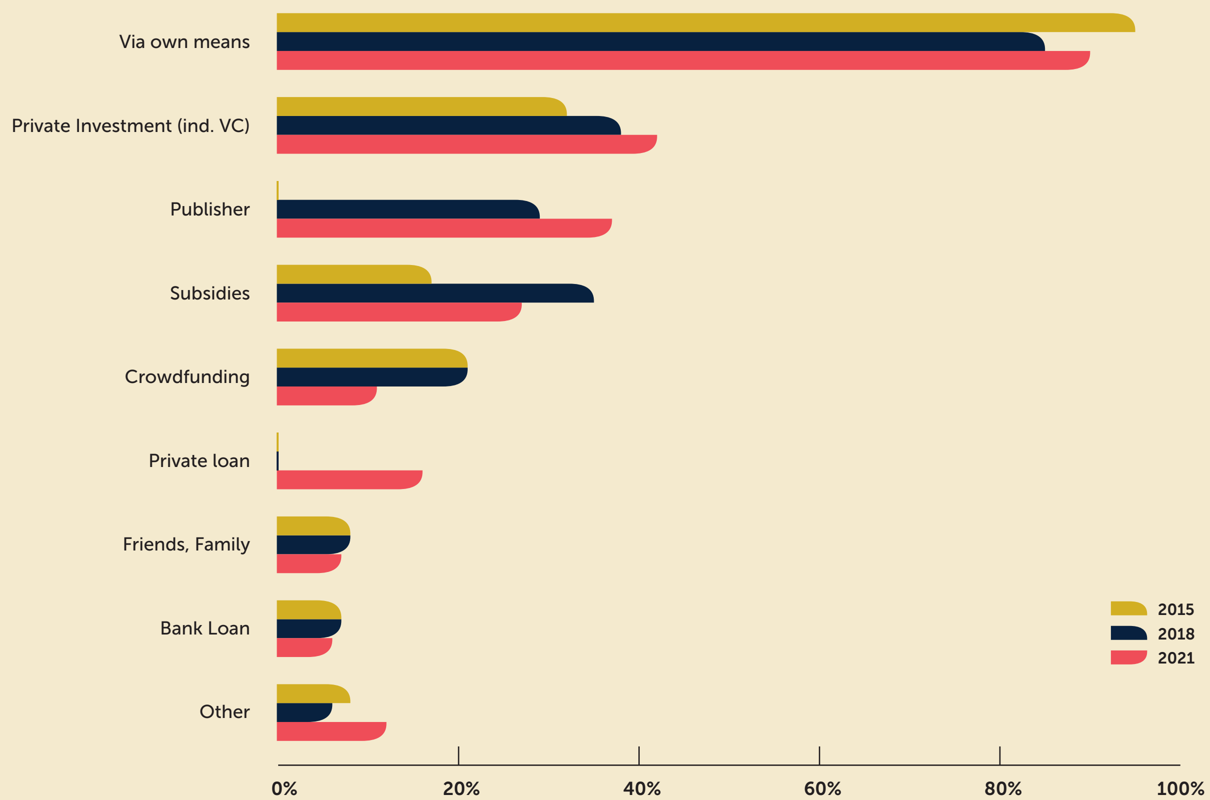


FIGURE 2.3

REQUIRED INVESTMENT AMOUNT[6]

(Source: Games Monitor survey 2022)

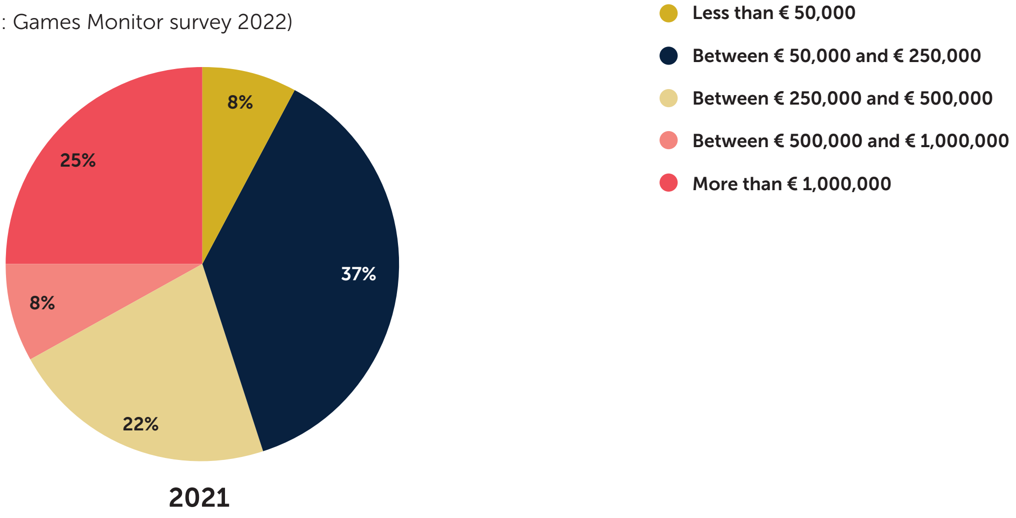
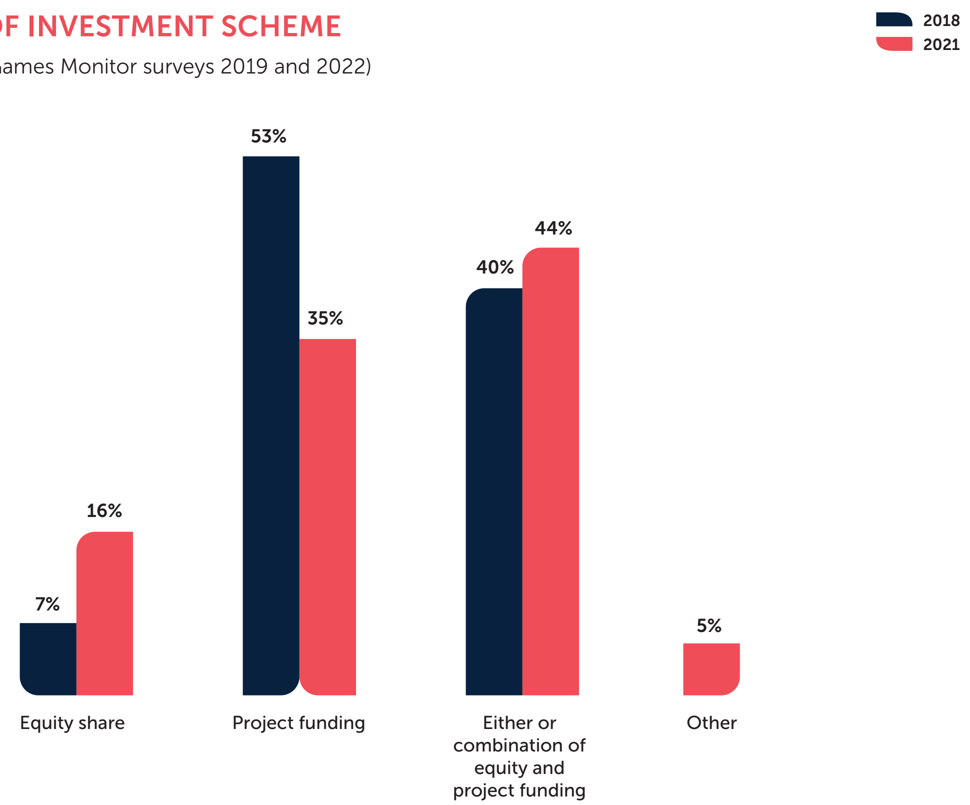


FIGURE 2.4

TYPE OF INVESTMENT SCHEME

(Source: Games Monitor surveys 2019 and 2022)



Crowdfunding is becoming less popular among Dutch game developers. On a crowdsourcing platform such as Kickstarter or Indiegogo the number of projects is growing, and it is hard work to get funded. You have to spend a lot of time gathering a community and doing marketing around your campaign. On Kickstarter, 46% of game projects (both digital and board games) get funded. However, most projects (over 90%) raise less than $100,000 and 67% less than $20,000.[2] One example of a Dutch video game project that acquired funding through Kickstarter recently (beginning of 2022) was Above Snakes by Tobias Schnackenberg.[3] Patreon is a niche method of fundraising for game developers. Sokpop Collective[4] is a successful example with more than 2,000 patrons,[5] they earn a regular income per month. With their unique approach to game development, they have released 100 games between 2018 and 2022.

If we consider the amount of money Dutch game developers are looking for in terms of funding, it is evident that this does not match with the amount you can raise on Kickstarter. Only 8% of the respondents are looking for less than €50,000 (see Figure 2.3). Over the years the amount of money that companies are looking for has steadily increased. The percentages of all categories, except the one of less than €50,000 have grown. The percentage of companies looking for more than €1,000,000 has tripled.

The maturing of the industry also shows in the type of arrangement companies are willing to accept. Project funding is still very relevant, but a growing number of companies are also interested in equity-based investments.

Internationally, the games industry has been flooded with news about mergers and acquisitions in 2020-2022. Due to the rapid growth the industry is attracting attention from all kinds of investors. Larger companies are on a shopping spree and acquire many international companies, leading to more consolidation in the market. Dutch game companies also attracted (inter)national attention leading to some interesting investments:

- Spil Games (Hilversum) first sold its mobile games branch to Azerion in 2019.[7] In 2020, Azerion acquired the remaining Spil games activities as well, leading to a full take-over.[8] Personnel was relocated to the Schiphol offices, meaning a large player left the city of Hilversum.

After the Fall – Vertigo Games

Winkeltje (The Little Shop) – Sassybot

- Vertigo Games (Rotterdam) joined Koch Media, now PLAION (a subsidiary of the Embracer Group), in 2020.[9] Vertigo Games operates as the VR Label for the PLAION group. Early in 2021, Vertigo Games acquired the Los Angeles-based VR-arcade platform SpringboardVR.[10]
- In 2021 Force Field VR (Amsterdam) became part of the PLAION group as well. All shares were acquired by Vertigo Games. The company now operates as Vertigo Studios Amsterdam.[11]
- Gamebasics (Zoetermeer) known for the game Online Soccer Manager, was acquired by Miniclip at the beginning of 2021.[12] Gamebasics now operates as Miniclip NL.
- Nixxes (Utrecht) was acquired by Sony Interactive Entertainment and joined the PlayStation Studios group in 2021.[13] Making Nixxes the second Dutch PlayStation studio after Guerrilla Games.
- Lucky Kat BV (The Hague) was acquired by Swedish-owned Fragbyte AB at the end of 2021.[14]
- In 2022 M2H sold its majority stake in the WW1 Games Series to Focus Entertainment just before the release of their latest WW1 game Isonzo.[15] Blackmill Games (also Alkmaar) continues to work on the WW1 Games Series.

A specific investment scheme is used by Azerion. This digital entertainment and media company with a strong basis in web-based games, funded its growth through a couple of bond issues in 2020 and 2021. In late 2021 they announced they were pursuing a listing on the Amsterdam stock exchange by using a Special Purpose Acquisition Company (SPAC) called EFIC1. On February 1st, 2022, the process was completed and the name of the stocks changed to Azerion. Thus, Azerion became the first Dutch game company to be publicly traded in Amsterdam.[16]

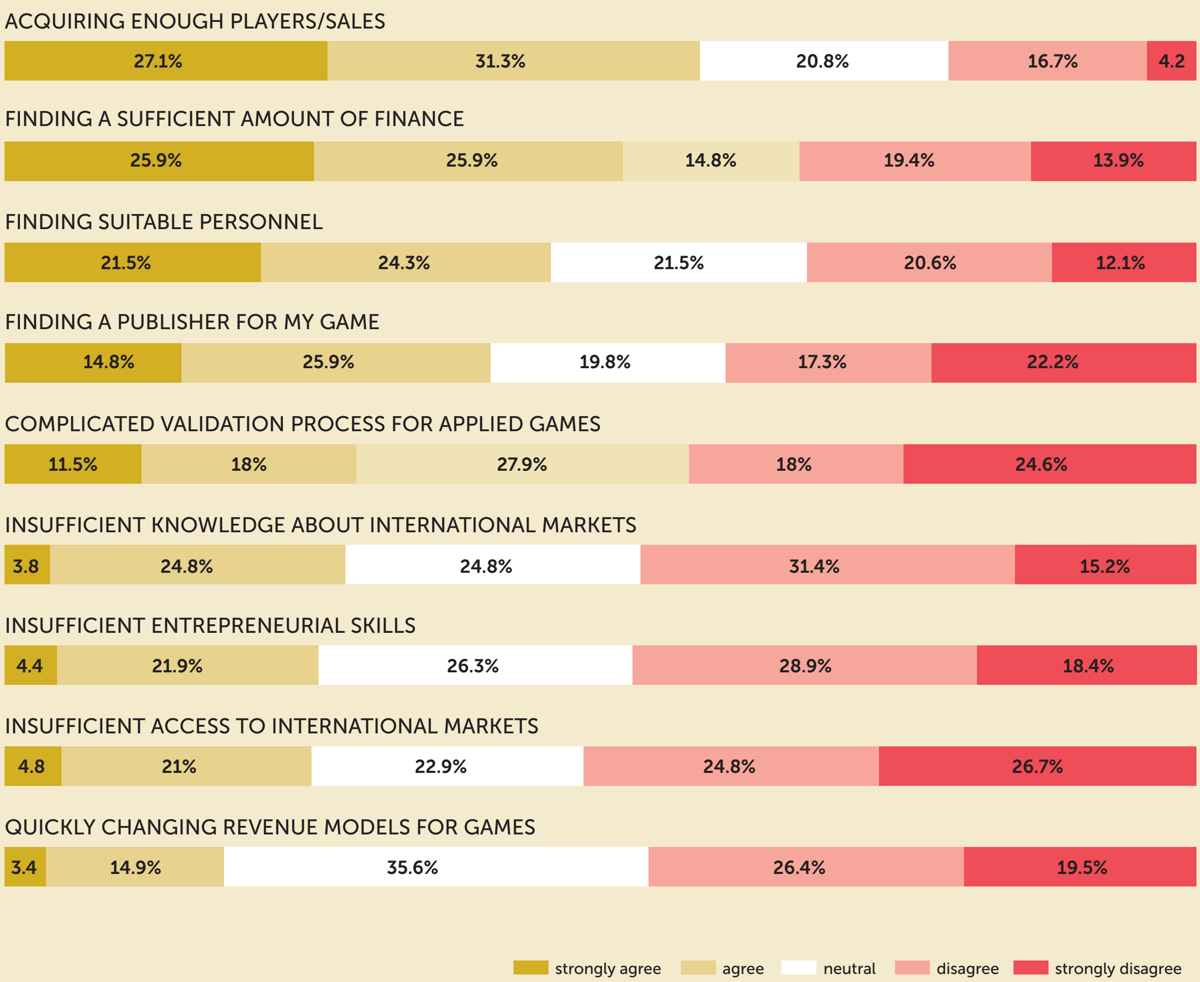
All examples mentioned above are acquisitions and investments in entertainment companies. Most of them are complete acquisitions and the acquired companies have become part of a larger international group. Applied game companies, in contrast, were also hunting for investments, but the preferred model for those companies is the more traditional Angel or Venture capital schemes. They only sell part of the shares of the company and remain majority shareholders. We saw several interesting investments in 2022:

- Tover (formerly known as Active Cues), based in Utrecht and known for its health-care product Tovertafel (Magic Table) received an investment from Karmijn Kapitaal[17] to help their expansion in North America.
- Arnhem-based Enliven received an investment from LUMO Labs and Oost NV for their empathy training in Virtual Reality.[18]
- Holomoves (Utrecht) focusing on Mixed Reality solutions for rehabilitation received an investment from the ROM Utrecht egion to further develop and validate their software.[19]
- Springlab (Utrecht), an applied game company focusing on games in an educational setting, reached an agreement with Netsam Participaties about a series-A investment.[20]

FIGURE 2.5

PERCEIVED CHALLENGES IN GROWTH

(Source: Games Monitor survey 2022)



2.3 CHALLENGES FOR GROWTH

Despite all the examples mentioned in the previous paragraph, finding a sufficient amount of capital to grow, remains a challenge for a large group of companies (roughly 50% of the respondents). In the 2015 edition of the Games Monitor, two main challenges were described. On the one hand, professional investors want a proven business model before they invest, and on the other hand, game companies are not used to the idea of giving up control or IP and have not thought about a potential exit strategy. These challenges have not changed much, but a few developments helped change the perceptions about external investments:

- There are more examples of successful investments available;
- These examples show it is possible to maintain your creative freedom;
- Not all investors want a quick exit and investors have gotten used to the rapidly changing business models in the games industry;
- The idea of 'smart money' has become more widespread: investors do not only offer money but also provide a useful network, experience, and knowledge.

The biggest challenges (see Figure 2.5) for Dutch game companies were acquiring enough players, acquiring sufficient funds, and finding suitable personnel. This top 3 has not changed compared to the 2018 edition of the Games Monitor. However, the percentage of user acquisition has increased and has become the largest challenge. This can be attributed to changing regulations around cookies in the European market (for instance the Digital Services Act). It has become much harder to target specific audiences.

It has also become more difficult to find suitable personnel. The Dutch economy as a whole is struggling with a shortage of personnel, as is the games industry. The games industry has the added challenge of being a sector with highly specialized jobs and a lack of qualified senior professionals or producers with game development experience. Finding a publisher seems to have become more difficult as well, as the percentage of companies that experience this challenge has risen from 26% in 2018 to 40% in 2021. Dealing with quickly changing revenue models on the other hand is something game developers have gotten used to, as only 18% agree that this is a challenge for growth.

All in all, we see that the Dutch games industry has grown in the years 2018-2021. Revenues and employee count have gone up, serious investments and acquisitions have been realized, and companies show more maturity in the growth or scale-up challenges they face.

Notes

1 http://midgame.fund
2 http://www.kickstarter.com/help/stats. Stats retrieved on December 2nd, 2022.
3 http://www.kickstarter.com/projects/266687617/lonesome-an-atmospheric-wild-west-mystery-rpg/posts
4 http://sokpop.co/#home
5 http://www.patreon.com/sokpop
6 Companies not interested in external funding are excluded from these numbers
7 http://www.azerion.com/azerion-acquires-spil-games-mobile-division-sale-delivers-great-mobile-ips-to-azerion-and-heralds-a-strategic-partnership-with-spil-games/
8 http://www.azerion.com/azerion-buys-spil-games-portals-business-to-become-casual-gaming-leader/
9 http://vertigo-games.com/vertigo-games-joins-koch-media-adding-vr-gaming-to-the-groups-global-network/
10 http://vertigo-games.com/vertigo-games-acquires-vr-arcade-platform-springboardvr/
11 http://vertigo-games.com/vertigo-games-acquires-vr-game-development-studio-force-field/
12 http://www.gamebasics.nl/en/proud-moment-for-us-were-joining-miniclip-to-step-up-our-games/
13 http://www.sie.com/en/corporate/release/2021/210701.html
14 http://fragbitegroup.com/mfn_news_en/fragbite-acquires-lucky-kat-b-v/?lang=en
15 http://www.m2h.nl/nl/m2h-sells-majority-share-ww1/
16 http://control-online.nl/gamesindustrie/2022/02/02/azerion-group-genoteerd-aan-de-amsterdamse-beurs/
17 http://www.karmijnkapitaal.nl/en/news/tover-joins-forces-with-karmijn-kapitaal-to-conquer-us-market/
18 http://enliven.one/en/news/press-release/
19 http://www.romutrechtregion.nl/nieuws/startup-holomoves-ontvangt-investering-van-de-rom/
20 http://www.linkedin.com/feed/update/urn:li:activity:6996090374842687488/

intermezzo

GLOBAL AND DUTCH GAME MARKETS

The Games Monitor reports about the revenues by Dutch game developers. As stated elsewhere, most developers generate these revenues on the worldwide market for games. Dutch consumers on the other hand buy games that have been developed all over the world.

The global video game market has grown significantly in recent years. There was a huge boost for games during the various lockdown periods with record-level engagement and consumer spending. This resulted in a growth in revenues in the global entertainment market from $138,8 billion in 2018 to $192,7 billion in 2021. Despite a consolidation in 2022 and 2023, revenues are expected to rise in the coming years.

The Dutch consumer market also showed growth during the COVID-19 years. The number of players reached more than 9 million Dutch consumers by 2021 and continues to grow. After a rise in sales in 2020, consolidation of revenues was seen in 2022 (See Table x.x).

In previous editions we also reported about the games industry in other countries. Since a number of years, the European Game Developers Federation (EGDF) provides this overview in her European Video Games Industry Insight Report. See https://www.egdf.eu/data-and-studies/ for more information.

Asgaard Saga – Hulan

TABLE I

GLOBAL GAMES MARKET DATA

REVENUES AND PLAYERS | 2018 - 2022 | COMPARISON GLOBAL AND THE NETHERLANDS

Source: Newzoo games market reports & forecasts october 2023

Region	Segment	2018	2019	2020	2021	2022
Global	Total Players	2.506,0M	2.668,7M	2.889,6M	3.074,6M	3.181,8M
	Total revenues	$138,8 Bn	$143,8 Bn	$179,1 Bn	$192,7 Bn	$182,9 Bn
Netherlands	Total Players	7,5M	7,9M	8,7M	9,2M	9,6M
	Total revenues	$0,9 Bn	$0,9 Bn	1,1 Bn	$ 1,2 Bn	$1,2 Bn

3.

Lake – Gamious

ENTERTAIN-MENT GAMES

Entertainment games lie at the heart of the video games industry. The past few years have shown a very large growth in the entertainment games market due to the COVID-19 pandemic. As we saw in the Facts and Figures chapter, Dutch game companies were able to profit from this growth in demand as well. Many entertainment game companies are positive about the state of their company and the games industry in general. In this chapter, we'll take a look at the specific characteristics of Dutch entertainment game companies. The figures in this chapter are based on the survey that was filled in at the beginning of 2022.

As stated in the Facts and Figures chapter, we counted 198 companies focusing on the development of entertainment games by the end of 2021. A further 24 companies develop both entertainment and applied games. Also, a large number of specialized subcontractors are involved in the development of entertainment games.

3.1 TRENDS AND CHALLENGES

Looking at the various game development platforms targeted by Dutch entertainment studios (see Figure 3.1), we see some interesting trends:

- There is growth across almost all platforms. This means that companies are using a multi-platform strategy;
- **PC** is the most popular development platform (over 87%);
- The dominance of PC development has risen considerably compared to 2018;
- **Mobile platforms,** Android phones and tablets, as well as iOS phones and tablets, show very similar percentages across the board (a little over 50% for all these platforms);
- The Nintendo Switch has become the most popular **Console platform** (52% of Dutch Developers), showing a growth of 19% between 2018 and 2021.
- Sony Playstation and Microsoft Xbox were mentioned by 43% and 41% respectively;
- Compared to 2018, more developers are aiming at the **VR market.** Roughly 20% of the respondents state that they develop for VR platforms (Oculus, Morpheus, Vive or other);
- Six percent develop for Playstation VR specifically.

FIGURE 3.1

PLATFORMS TARGETED BY DUTCH GAME DEVELOPERS

(Source: Games Monitor surveys 2019 and 2022)

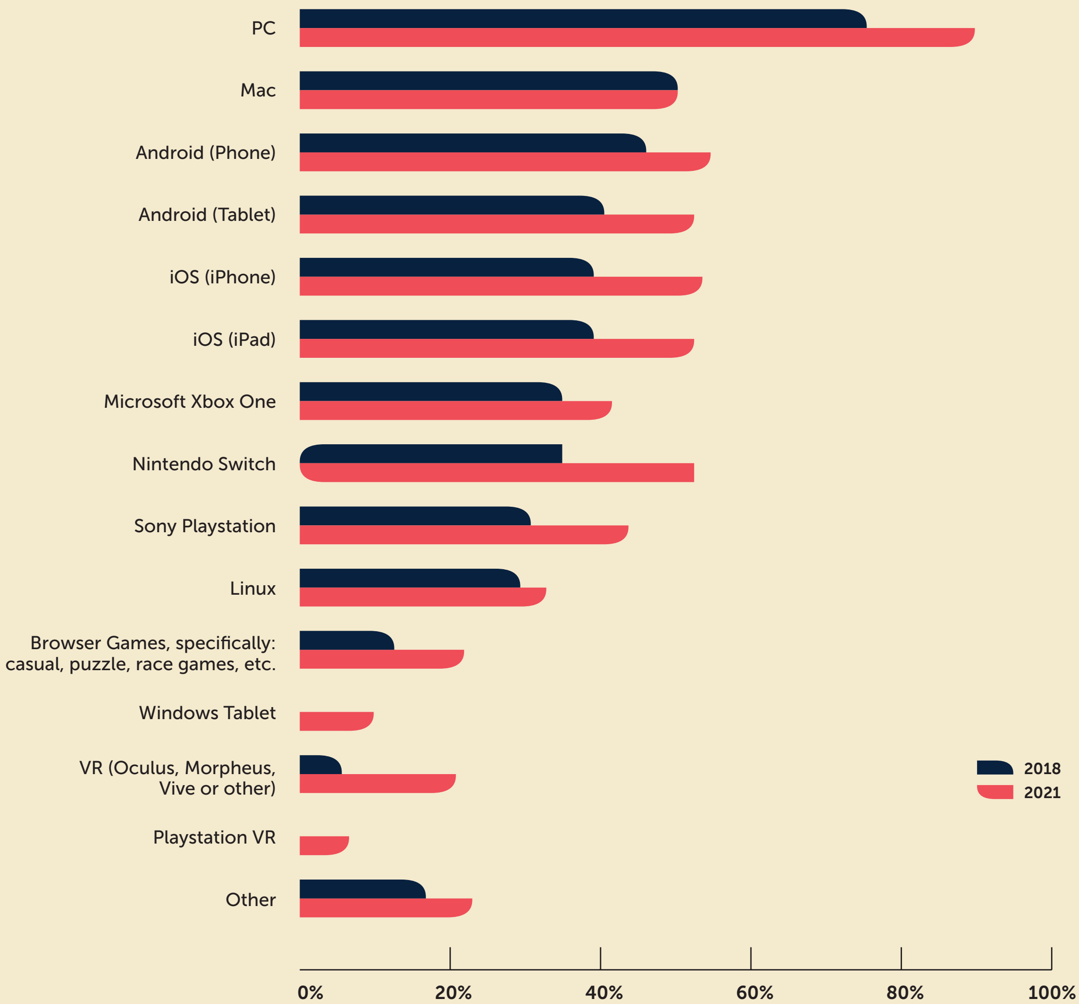
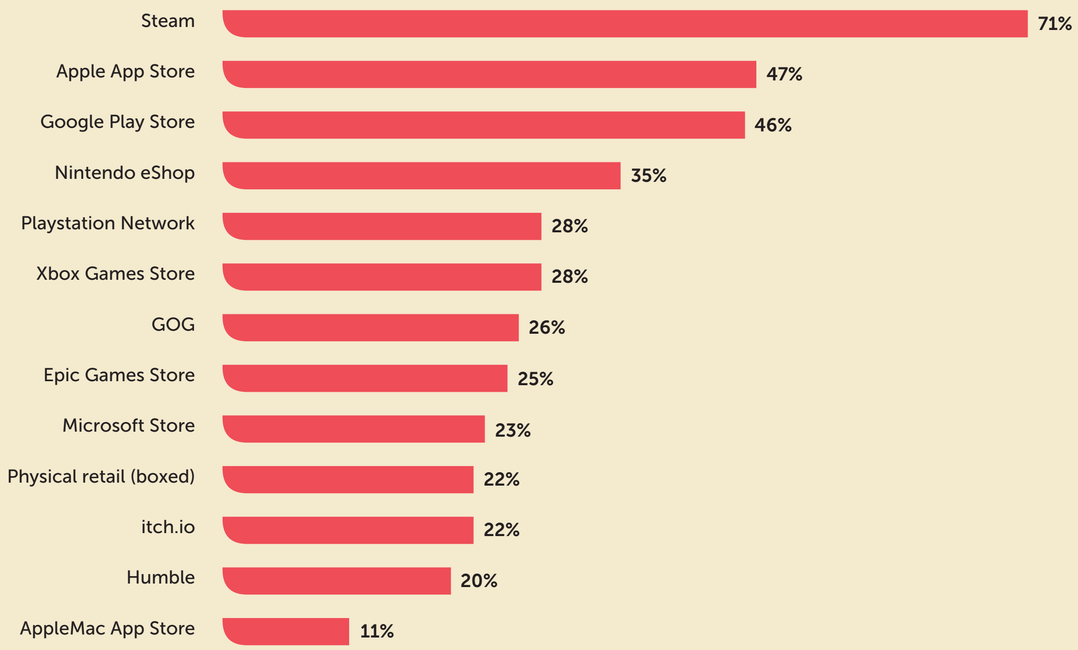


FIGURE 3.2

DISTRIBUTION CHANNELS FOR ENTERTAINMENT GAMES

(Source: Games Monitor survey 2022)



Considering the focus on PC games, it comes as no surprise that Steam is the most popular distribution channel for Dutch developers (see Figure 3.2): 70% use Steam as a distribution channel, and for 51% it is the primary channel. Apple iOS (47%) and Google Play Store (44%) are also popular distribution channels among Dutch game studios. However, the number of companies using those channels as their primary **distribution channel** is much lower (12% and 5% respectively). Nintendo eShop, Playstation Network, Xbox Games Store, GOG, and the EPIC Game Store are used by more than 25% of the developers. Only a few companies use one of these as their primary platform. In the first edition of the Games Monitor report (2012), the researchers stated that boxed games were passé with just 20% of the developers offering games in a physical box. Even though almost all games nowadays can be played online or downloaded, 20% of entertainment companies still use boxed games to sell their games. Relatively new subscription platforms such as Apple Arcade and Google Play Pass are only used by a small number of companies in 2021.

Across all platforms, premium games are the preferred **monetization strategy** for Dutch entertainment companies. Almost 75% of the respondents said they use premium models. Between 2018 and 2021 the use of premium models for game developers has risen from 52% to 74%. As can be seen in Figure 3.3, companies are often combining multiple monetization strategies. A premium game, for example, is often followed by Downloadable Content such as new worlds or storylines. Mobile games combine in-app purchases and in-game advertising. This trend of hybrid monetization fits the global trends for the games industry, as Newzoo[1] observes in its annual report. Individual subscription models have become less popular since large distribution channels now offer their own subscription models (Apple Arcade, Google Play Pass etc.). For developers, this offers new opportunities. Some obtain project funding to develop games

FIGURE 3.3

MONETIZATION STRATEGIES DEPLOYED FOR ENTERTAINMENT GAMES

(Source: Games Monitor surveys 2019 and 2022)

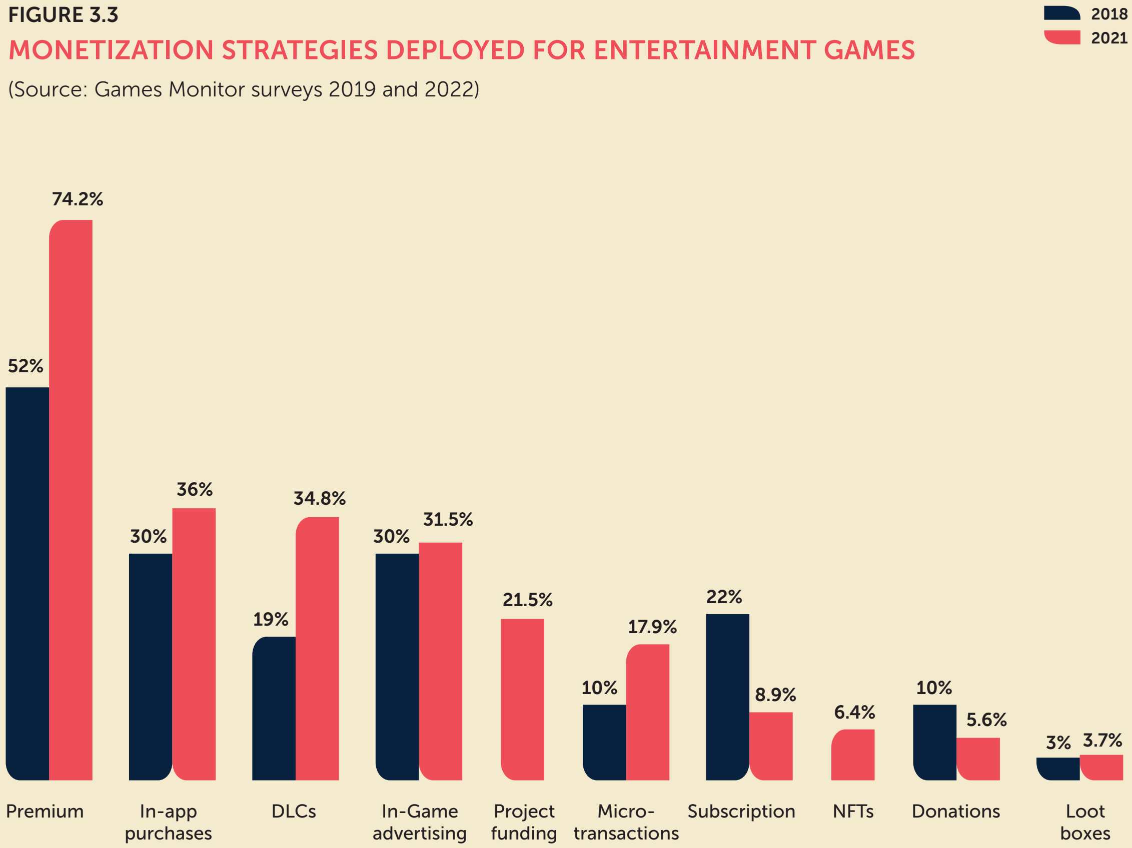
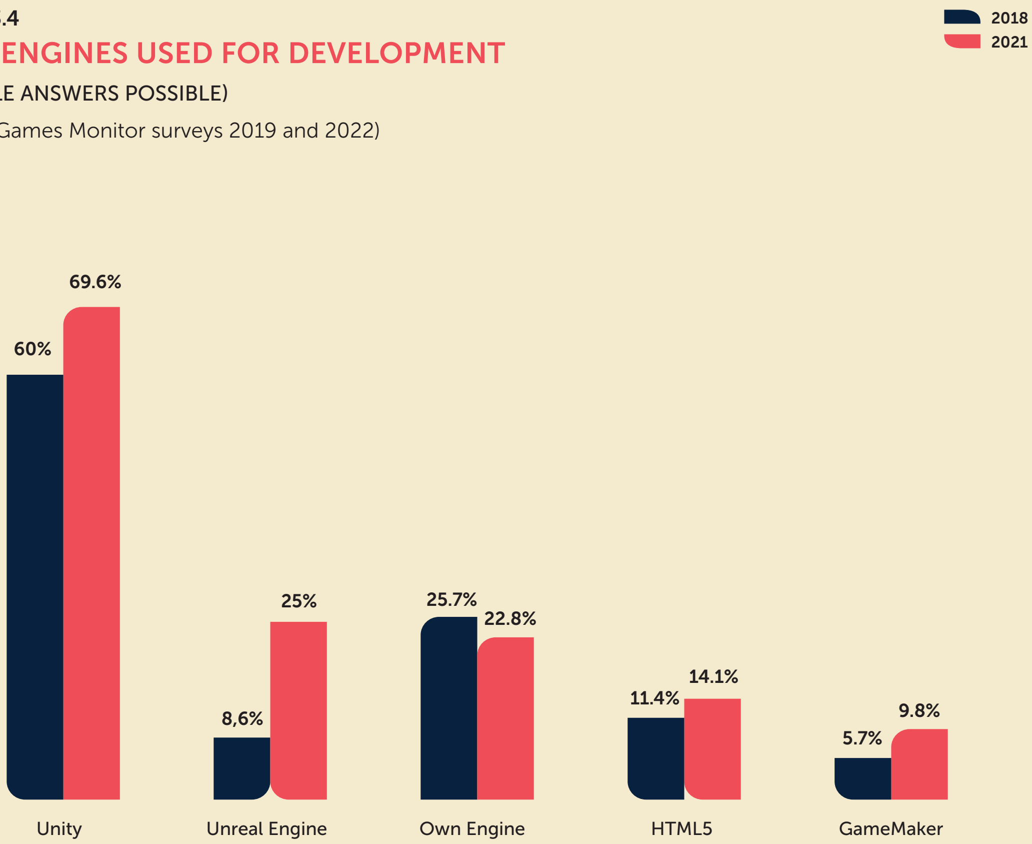


FIGURE 3.4

GAME ENGINES USED FOR DEVELOPMENT

(MULTIPLE ANSWERS POSSIBLE)

(Source: Games Monitor surveys 2019 and 2022)



for these channels, or with little effort can offer a mobile game to a new audience. Project funding is an important strategy to finance games for over 20% of the developers. Non-fungible Tokes (NFTs) obviously are a relatively new phenomenon. In 2021 6,4% of the developers were using NFTs in their games as a monetization strategy. Opinions on the use of NFTs in games can be found in paragraph 3.3. Loot boxes in games are offered by a very small number of Dutch game developers.

With more games coming out on multiple channels and an overall growth in the number of games published annually, getting noticed has become increasingly difficult. More than 10,000 games were released in 2021 on Steam alone.[2] The peak of self-publishing is behind us, as more companies are using publisher services again. Almost a quarter of the respondents don't use the self-publishing model at all. Yet a large number of Dutch game developers choose self-publishing as a viable way to market their game. Almost half of the respondents state they self-publish (almost all of) their games. Self-publishing companies regularly use the services of marketing companies as a way to attract more attention.

As previously mentioned, game developers use a multi-platform, multi-distribution, and multi-monetization strategy for their game development. For game engines, we also see a simultaneous use of different engines (see Figure 3.4). The use of commercial engines as a whole has grown compared to a proprietary (or own) engine. Unity is still the most popular engine, but Unreal is growing fast (from 8% in 2018 to 25% in 2021). Note that this increase was already happening before the launch of the latest release of Unreal 5. One of the reasons the use of Unreal Engine has grown is a change in the pricing model. In the past Unreal was more expensive than Unity, but Unreal now is free to use without upfront payment but with a royalty fee.[3] Unity on the other hand doesn't ask for a royalty fee but requires a subscription fee for a Pro Licence.[4]

Traffic Jams – Little Chicken

Both engines have their advantages and disadvantages, making them more suitable for different types of games.

3.2 NON FUNGIBLE TOKENS

A hard-to-neglect trend in the video games industry in 2021 is the use of NFTs (Non-Fungible Tokens) as part of the gameplay experience. A Non-Fungible Token is "a unique digital identifier that cannot be copied, substituted, or subdivided, that is recorded in a blockchain, and that is used to certify authenticity and ownership (as of a specific digital asset and specific rights relating to it)".[5] NFTs are used in entertainment games to specify that a character or game asset is unique and that a player has proof of the fact that someone owns this unique character or other virtual assets. Often, NFTs relate to the sale of Tokens, which can function as in-game currencies. But they are more than that. Tokens are positioned as cryptocurrency and game companies try to establish a second in-game economy where these tokens have their own unique value. By using tokens, it becomes possible to sell your

NFTs: both the ones you have bought and the ones you have earned by playing the game. The value of the tokens develops with the popularity of the game. Tokens are linked to cryptocurrencies outside of the game economy used to pay for them, such as Ethereum or Solana. So, the value of the Tokens is linked to both changes in the popularity of the game and shifts in digital financial markets for cryptocurrencies, making their value very volatile.

There is a lot of discussion within the Dutch video games industry about the use of NFTs in games. Some game developers have strong opinions against it. Some of the criticism is centered around the design of the game (not fun, mainly a virtual collection of items), and most of it centers around ethical aspects (for example gambling elements in particular when targeting younger audiences, money laundering, etc.). There also is a huge concern about the sustainability of the method, mainly the energy consumption for mining cryptocurrencies. In our survey, 45% of the game companies strongly opposed the use of NFTs (see Figure 3.5). Twenty-two percent see advantages for game developers. Around 50% of the respondents are uncertain about the use of NFTs (Pros and Cons are unclear or "Time will Tell"). Several respondents added that the current use of NFTs is still in the early phases of the hype cycle, mentioning that certain elements are interesting, but the existing examples of usage are as of yet, not interesting or realistic in the long run.

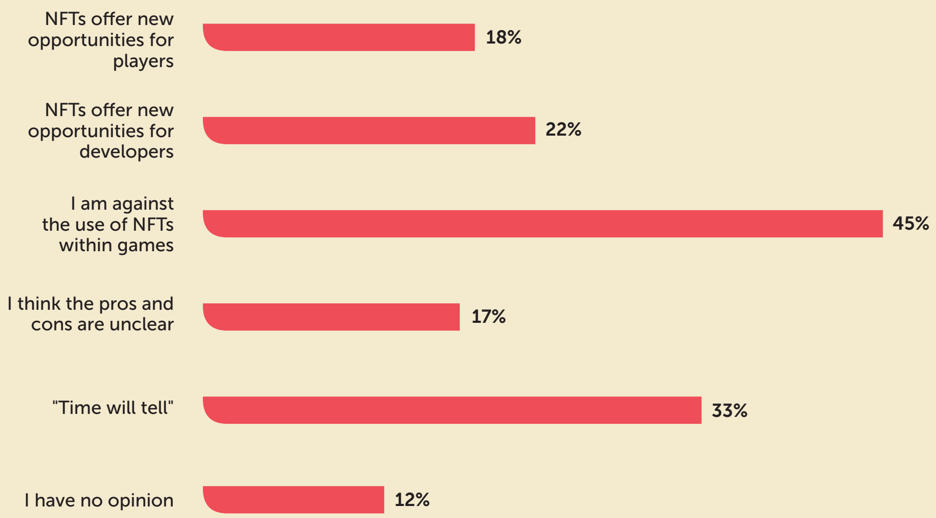
In the survey (early 2022), 6% of the companies indicated they use NFTs as a monetization strategy. Almost 40% of the respondents expect a growth in the demand for NFTs in games. We see that NFTs are sometimes used

Panzerdogs – Lucky Kat Studios

FIGURE 3.5

OPINIONS ABOUT NFTS

(Source: Games Monitor survey 2022)



in existing games, for example, Habbo Hotel (part of Azerion's portfolio), but are mostly used in new games. These are created from scratch with blockchain technologies being part of key gameplay and game economics design. For many of these games, (some) tokens are sold before the game is finished. Players become investors with the sales of tokens as a way to finance game development upfront.

A notable Dutch frontrunner in NFTs is Panzer-dogs, an online Tank Brawler developed by Lucky Kat Studios. In December 2021 Lucky Kat sold 5,555 Panzerdogs in just 15 minutes.[6] They have repositioned themselves as a web3 metaverse game studio and are acquired by Fragbite AB. In the summer of 2022, the group sold tokens for US $3.35 million to further develop its metaverse. Lucky Kat Studios is part of this venture and is currently building a second web3 game where Panzerdogs NFTs are also accepted as currency.[7]

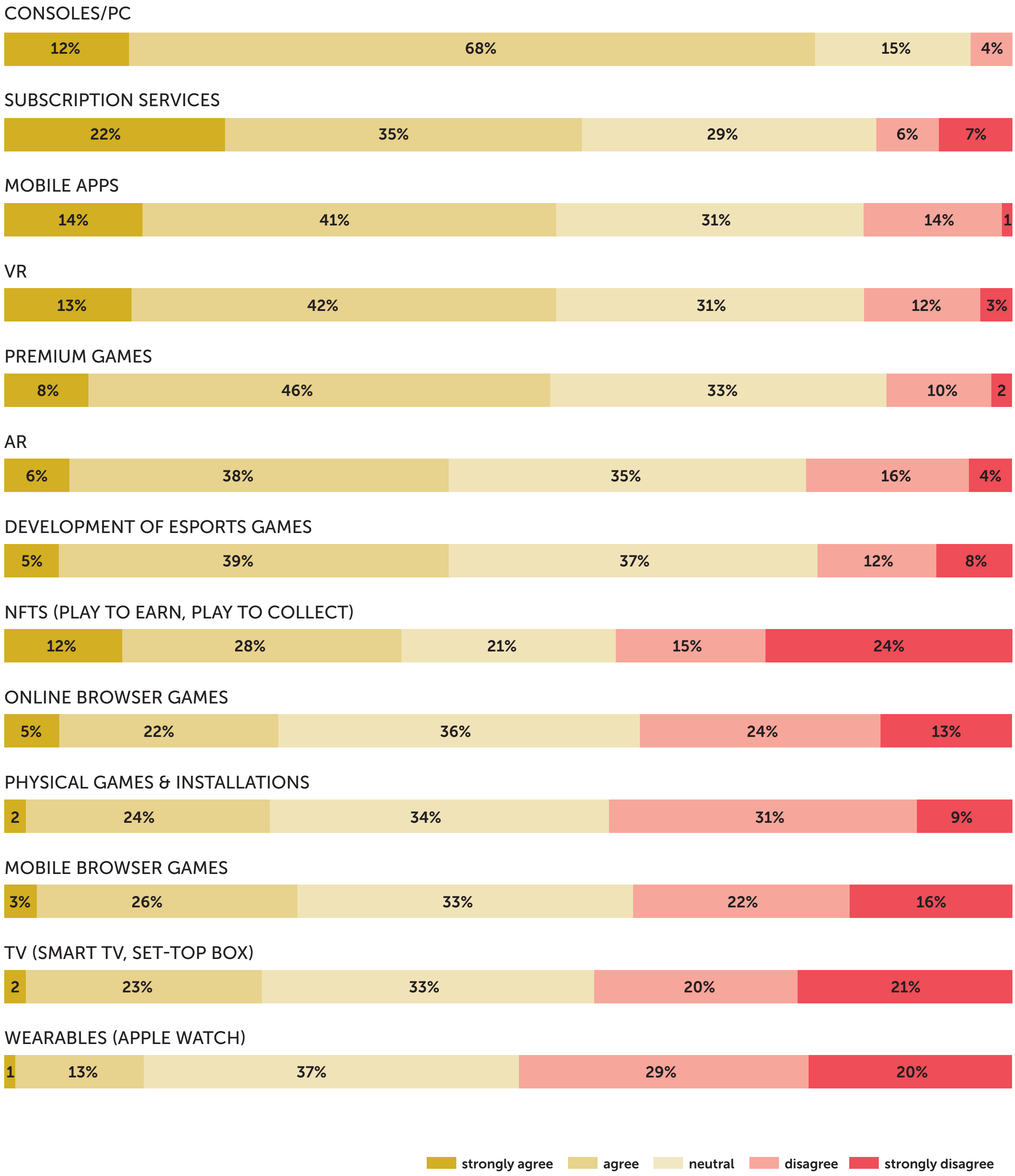
Another successful Dutch example is Spider Tanks by Gamedia, coincidentally also an online Tank Brawler. Gamedia teamed up with Gala Games for the distribution of the game which is part of the Gala Ecosystem and the GALA cryptocurrency. NFTs in Spider Tanks allow players to purchase parts of the tanks and weapons. Next to building and collecting tanks, Spider Tanks is a competitive skill-based game and also linked to Esports tournaments.[8]

However, not all projects are successful. Dreamfuel Games was a Dutch start-up with ambitious plans for a blockchain-based game called Infinity Skies. Although successful in getting the first round of funding, they filed for bankruptcy due to the lack of sufficient sold tokens needed to fund their game deve-lopment.

FIGURE 3.6

EXPECTED GROWTH FOR VARIOUS ASPECTS CONCERNING ENTERTAINMENT GAMES

(Source: Games Monitor survey 2022)



3.3 EXPECTED GROWTH

In our survey, we asked developers about their expectations concerning growth in several markets. The most notable findings (see Figure 3.6) are:

- The largest growth is expected in the console/PC market (68% agree and 12% strongly agree). This is a higher percentage than three years ago.
- Expectations for subscription services are very positive as well. This model has developed a lot in the past years with for instance Google Play Pass, Apple arcade and others. We cannot compare the numbers with earlier editions of the survey.
- Expectations for mobile games are also positive, but sales are lower than three years ago. This is due to difficulties in gaining traction for a game and changes in European legislation (opt-in policies) making advertisements less specific and thus less profitable.
- Expectations for the VR market are more positive than three years ago. There have been a number of successes, hardware has become more affordable and console providers are also putting more focus on the segment (for instance a VR version of Horizon Forbidden West).
- Augmented Reality (AR) on the other hand is perceived less positively than three years ago. Even though multiple AR games have been launched after Pokémon Go, none of them reached the same success level. Several years afterwards, AR technology has not reached its peak and most don't think it will in the upcoming years. AR is also usually tied with mobile games where the industry is already pretty competitive. Additionally, compared to other mobile games, AR seems less suitable for in-game advertising.[9]

While PC is the most popular platform among Dutch developers and Steam is the most popular distribution channel, entertainment game developers show a large variety in how they develop their games. Dutch game developers use a multi-platform, multi-distribution, and multi-monetization strategy for game development. Growth is expected for many market segments.

Notes

1 Newzoo (2022) Free Global Games Market Report

2 http://www.statista.com/statistics/552623/number-games-released-steam/

3 http://www.unrealengine.com/en-US

4 http://unity.com/

5 "Definition NFT." *Merriam-Webster.com Dictionary,* Merriam-Webster, http://www.merriam-webster.com/dictionary/NFT. Accessed 24 Nov. 2022.

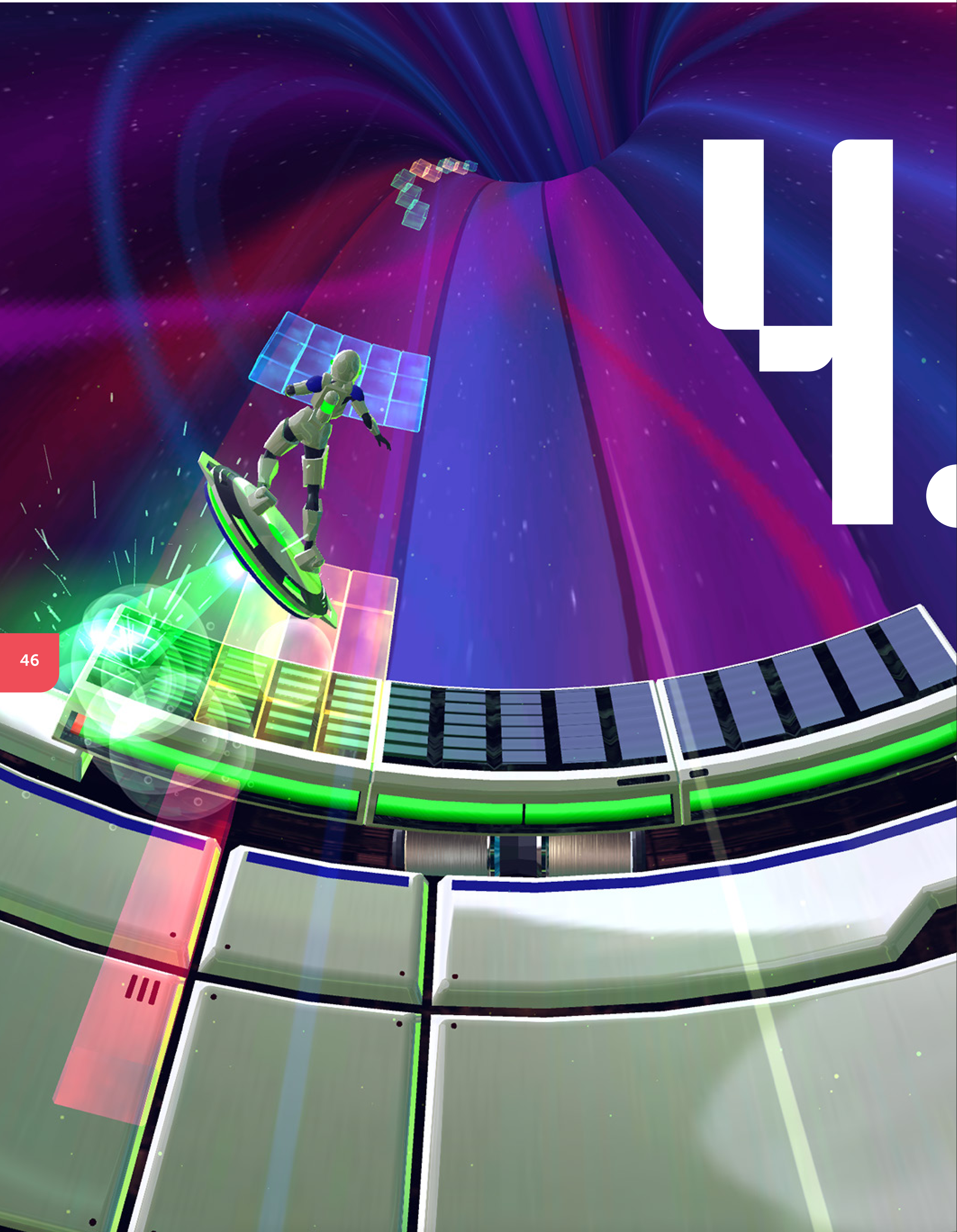
6 http://www.lucky-kat.com//#Web3

7 http://view.news.eu.nasdaq.com/view?id=bdfd-77d8932fb747603d7c94d3fa7be23&lang=en

8 http://www.spidertanks.game/

9 http://www.gamedeveloper.com/extended-reality/ar-game-market-growth-might-be-stalling

4.



Neon Conduit – Grendel Games

APPLIED GAMES

The previous chapter looked at the characteristics of entertainment game companies. The Dutch games industry is known for the broader use of games and applications in other sectors as well. It is important to note that for our survey only applied game companies with game development as their core business were approached (see also chapter 6). In this chapter, we will look at trends and developments for applied games.

4.1 TRENDS AND CHALLENGES

Around a quarter of Dutch game companies are involved in the development of applied games. By the end of 2021, a total number of 151 focused exclusively on applied games and another 24 were developing both applied and entertainment games. Together these companies employ almost 1,450 people. The number of applied game employees has grown between 2018 and 2021 in line with the Dutch games industry as a whole. The number of applied game companies has increased relatively faster (151 in 2021 compared to 114 in 2018). This growth in the number of companies can be explained by the background of the founders of applied game companies. New applied game company founders tend to have expertise in a specific domain, for example, rehabilitation or another specialism in the healthcare sector, or have a consultancy background.

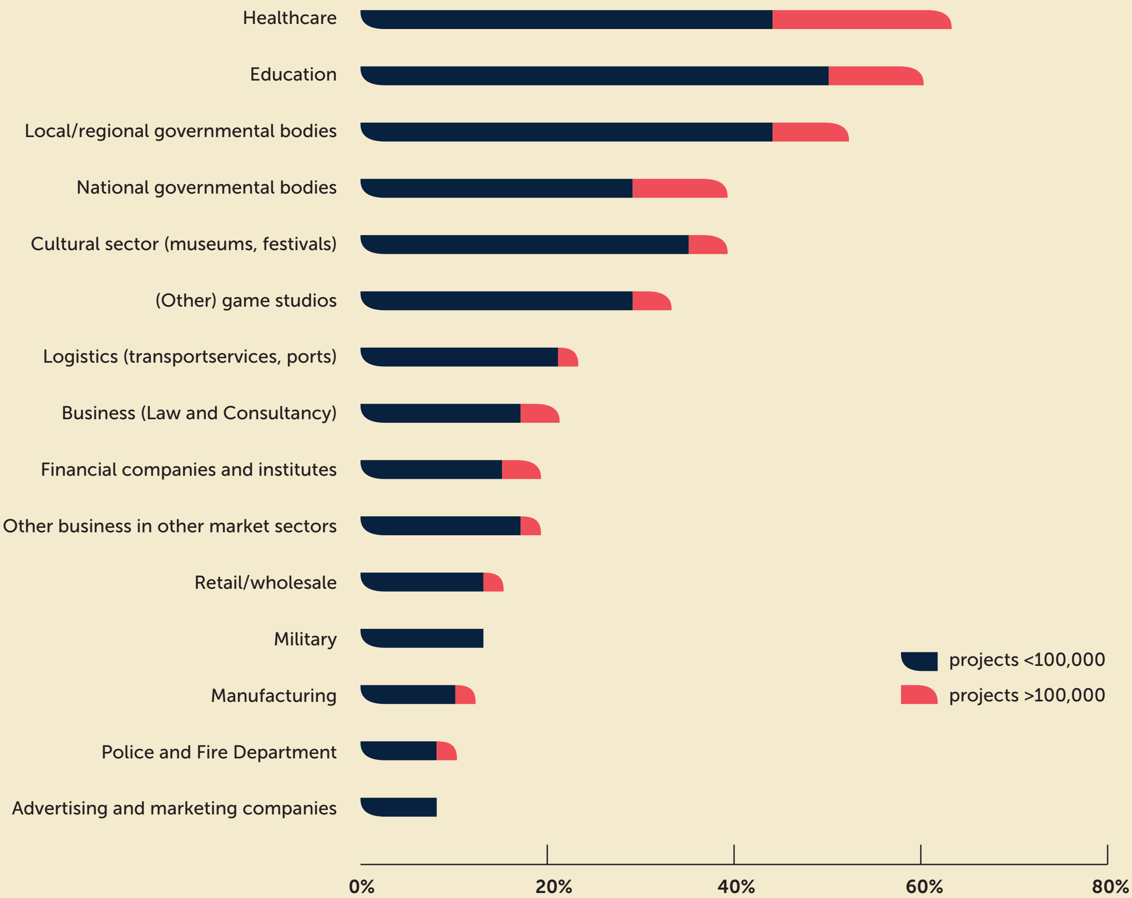
At the beginning of 2021, we published an interim update of the Games Monitor,[1] looking at the impact of the COVID-19 pandemic on the games industry. One conclusion from this report was that B2B companies, including applied game companies, were hit harder by the pandemic than entertainment companies. When the first lockdowns hit, many projects in the B2B market were canceled, postponed, or slowed down. The healthcare market showed specific challenges due to limited access to patients, or a complete shift in priorities. By the end of 2020, we saw large differences between companies. For some, the situation was improving again, others were still struggling.

COVID-19 also had an impact in 2021, lockdowns or partial lockdowns were still happening although with less impact than in 2020. COVID measures had a substantial impact on business events. Some conferences were organized digitally or in a hybrid format but others were canceled. As a result, it was still difficult to showcase and profile applied games at business events, making it harder to attract new clients. Some applied game developers also told us that the lack of opportunities in 2020 still had an impact on 2021. Projects were smaller, had a different nature, or were less innovative than before the COVID-19 pandemic.

On the other hand, some companies or projects were able to profit because of new insights and a different focus during the COVID-19 pandemic. The pandemic led to a lack of physical meetings and limited the way people could travel and work on location. This created an excellent opportunity to showcase the added value of certain applied games including applications using Virtual Reality.

Missie Master – 8D Games

FIGURE 4.1
APPLIED GAMES - CLIENT SEGMENTS
(Source: Games Monitor survey 2022)



When looking at the numbers, we see a resilient sector: 84% of the applied game companies in our survey indicate that their revenue has either remained stable or has increased between 2018 and 2021. Sixteen percent of the respondents saw their revenue drop. This is 2% less compared to the survey results from 2018.

All in all, the applied games sector has shown a growth in the number of companies, employees, and revenues. But the growth was somewhat slower than for entertainment companies.

4.2 SCOPE OF THE APPLIED GAMES INDUSTRY

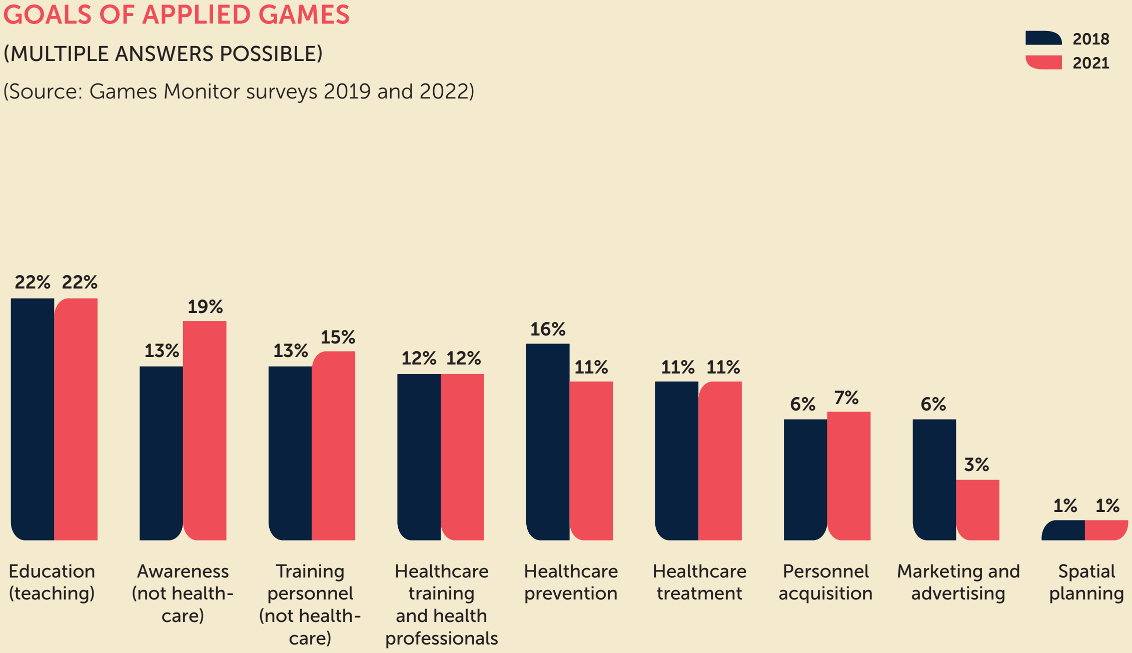
Comparing the results from the current client segments (see Figure 4.1) to the ones from the 2018 Games Monitor, it can be seen that healthcare and education have remained the largest market segments for the applied games sector. Approximately 73% of the respondents say that they have projects from clients in healthcare and 69% of the respondents have projects from the education sector. Projects in healthcare in general are larger in size and scope, 22% of the respondents state that they have projects with a budget of over €100,000 from clients in the healthcare sector. The aim of these projects is mostly focused on teaching and creating awareness.

FIGURE 4.2

GOALS OF APPLIED GAMES

(MULTIPLE ANSWERS POSSIBLE)

(Source: Games Monitor surveys 2019 and 2022)



We have specified the size of projects in our survey for the first time. Previously, we used the subjective criteria “large” and “small”. So, we can’t exactly compare the data with previous editions of the Games Monitor. However, we see a tendency of projects with a smaller scope compared to previous years. This is corroborated by several of the developers we interviewed personally.

One notable difference in terms of project size is the military sector. Previously, we only saw large projects for this type of client, in this edition only small projects were reported. Since it is a highly specialized field it may be circumstantial but there are two reasons which might explain this difference. The military sector uses simulations and game applications regularly for training purposes, but they develop these experiences in-house more often. The Royal Navy, for instance, has set up a Maritime Simulation Center (SimCenMar) in Den Helder. This department is styled as a game development studio but is part of the Navy. It consists of navy personnel, experienced (civilian) game developers, and interns. SimCenMar provides the Navy with an in-house option to create simulations that look as polished as video games, and they aim to make them as entertaining as possible.[2] Besides more in-house development, military training and simulations are developed by companies that fall outside of our predefined scope where a game company is included if game development is part of their core business. A prime example of the applied games industry being much larger than we currently measure.

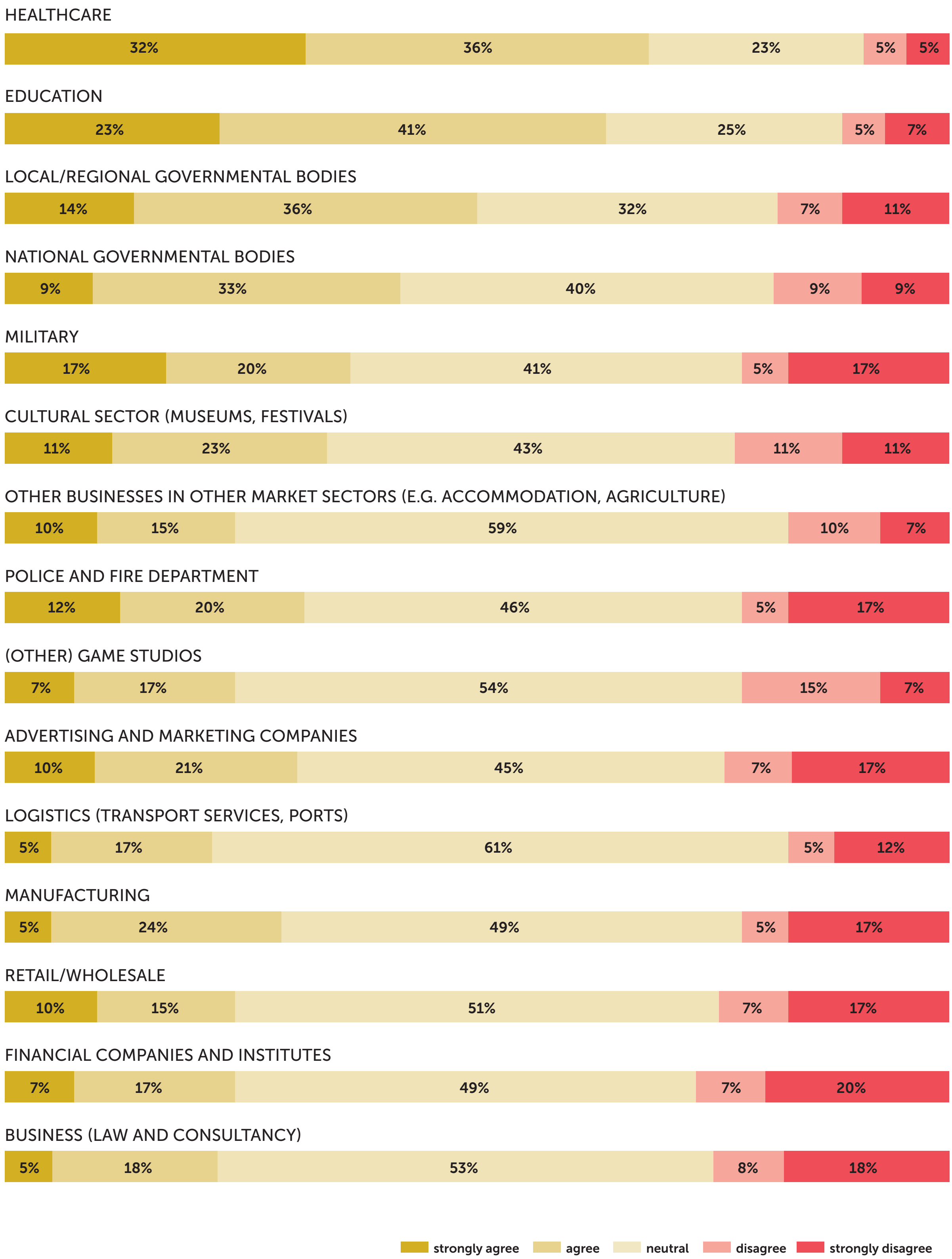
Whereas entertainment games are primarily made to create a fun and engaging player experience, the main aim of applied games is to educate and teach players about various topics. Teaching, training, and creating awareness were the goals most mentioned by developers (see Figure 4.2).

A growth in demand is expected in many sectors (see Figure 4.3). Healthcare and education are most prominent in the answers by the respondents. The demand from several governmental bodies is also expected to grow. For some sectors, expectations are more mixed, probably due to the (un)familiarity with a certain sector.

FIGURE 4.3

EXPECTED GROWTH IN APPLIED GAME MARKETS

(Source: Games Monitor survey 2022)



4.3 VIRTUAL REALITY

Applied games are often played in a specific time and place such as a school, hospital, or retirement home as they serve different educational purposes. According to our survey, most applied game studios develop games for PCs, phones (iOS and Android), and tablets. VR also has become a popular game development platform. The increase in VR games for sectors such as healthcare and education is a continuing trend. Not only in the development of new games but also in actual adoption of the technology. The use of applied games in VR offers an opportunity to reduce costs: apart from the travel costs (and time) to go to a training location, it is quite expensive to use certain (medical) equipment. The COVID measures (less (international) traveling, fewer people in one room) offered an opportunity to experience the advantages of using VR games as well. People could train at home or in their own facility in a safe environment at a time that suited their personal schedule.

Interestingly, other industries are also becoming more aware and open to the possibilities of interactive experiences in VR. VR is seen as a great tool to simulate real-world situations that allow the player to develop skills in a safe way.

Soft skills can also be practiced in VR. The Simulation Crew, for example, has developed several training modules in VR for soft skills: job application training, motivational interviewing, and patient comforting techniques.[3] All of these modules aim to make a conversation as natural as possible by using speech recognition, gesture recognition, and eye tracking.

In the healthcare sector, VR games are not only used for training personnel but also for treating patients. Some examples are mentioned below:

- Corpus VR[4] is a platform for physio- and neurotherapy developed by inMotion VR. The platform can be used as therapy for physical rehabilitation and pain relief by letting the patients play games in various game environments.
- HoloMoves[5] develops patient scenario training for healthcare workers and rehabilitation exercises for patients. In collaboration with UMC Utrecht (Utrecht Medical Center), they developed a Mixed Reality training where players can practice real-life scenarios with virtual patients.
- Koji's Quest by NeuroReality[6] is a cognitive rehabilitation game that allows players to train cognitive functions like multitasking, planning, and short/long-term memory. This game is in the clinical trials phase and the company has put a lot of effort into scientific validation.

4.4 FUNDING AND INTERNATIONALIZATION

A few applied game companies focus on one or two products, but most companies work on multiple projects simultaneously. On average, applied game companies worked on 15 projects per company in 2021. With some of them even working on more than 50 projects. Obviously, with such a large number of projects, most of those are for external clients. Only 25% of the applied game companies work exclusively on their own projects. Similar to entertainment game developers, multiple funding and monetization strategies are used by applied game companies. Not surprisingly, project funding is the most important business model for applied game companies (almost 75% of the respondents that develop applied games). Subscription fees or service fees were both mentioned by 25% of the respondents. Over the past years, the number of companies that focus on a specific product or service is slowly increasing. These companies also try to sell their services abroad. The average international turnover is small, with around 24% of their annual revenues. This is comparable to 2018. However, there are huge differences between companies. Some of them are expanding their international market rapidly.

Some examples:

- Tover[7] (formerly Active Cues) was already mentioned in the 2018 Games Monitor. In the meantime, they have scaled inter-

national sales considerably. After a controlled start in nearby markets in Europe, Tover started working with the Australian distributor Leef in 2020 to make the 'Tovertafel' available in Australia and New Zealand. At the moment, they are expanding their business in North America.
- Hackshield[8], a game developed by Flavour, is designed as a movement to teach children about cyber security. By the end of 2021, the number of players grew rapidly, reaching more than 85,000 players before they expanded their activities to Brazil.
- SyncVR[9]– a platform for XR applications in the healthcare industry, not only offers its own applications but also third-party applications, including for instance Reducept and InMotion VR.
- 8D Games[10] continues to work for many different clients but is slowly expanding the number of international customers and partners.

In terms of international markets for applied game companies, emphasis lies on nearby markets: Germany, Belgium, the United Kingdom, and to a lesser extent Scandinavia. Outside Europe the United States is the dominant sales market for applied games.

4.5 VALIDATION OF APPLIED GAMES

Validation of applied games remains a challenge, especially in the healthcare sector. Besides the necessary research to prove the games work and achieve their learning or treatment objectives, game companies also focus on getting the required registration as a medical device (CE marking). Several companies already have received a CE marking for their product, for example, the aforementioned InMotion VR and HoloMoves. In the Games Monitor survey, validation was still mentioned as a challenge, but it was not the largest obstacle to growth. Financing and finding enough qualified personnel were seen as larger obstacles.

Internationally, the potential of using games as a prescription medicine is getting more traction. Endeavor XR[11] developed by Akili Interactive received regulatory approval by the FDA for their game to treat children with ADHD in June 2020. RelieVRx (formerly Ease VRx) by Applied VR Inc. was one of the first VR therapies to receive a breakthrough device designation from the FDA. It is authorized as an at-home treatment to relieve lower back pain.[12] However, for most games reimbursement of therapies through games will remain a challenge because insuring companies require more evidence of efficacy.

Applied games are still an active and broad industry with many potential clients and contexts. Despite a challenging period during the COVID-19 pandemic, the applied games industry in the Netherlands has grown between 2018 and 2021. There is a solid expertise in the Netherlands with some companies further specifying their scope across the education and health sector, both in national and international markets, and using technology such as VR to engage new training opportunities.

Notes

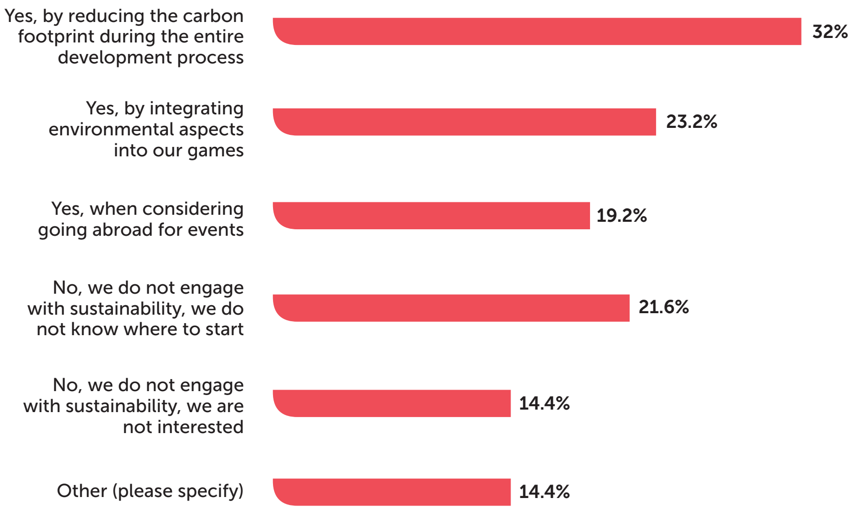
1 Games Monitor COVID Impact (2021). Can be retrieved from: http://www.dutchgamegarden.nl/games-monitor/
2 http://simcenmar.nl/
3 http://hesimulationcrew.com/
4 http://inmotionvr.com/corpusvr
5 http://holomoves.nl/
6 http://neuro-reality.com/
7 http://www.tover.care/us/
8 http://nl.joinhackshield.com/en
9 http://www.syncvr.tech/
10 http://8d-games.nl/en/mogelijkheden/international-partnerships/
11 http://www.akiliinteractive.com/
12 http://relievrx.com/

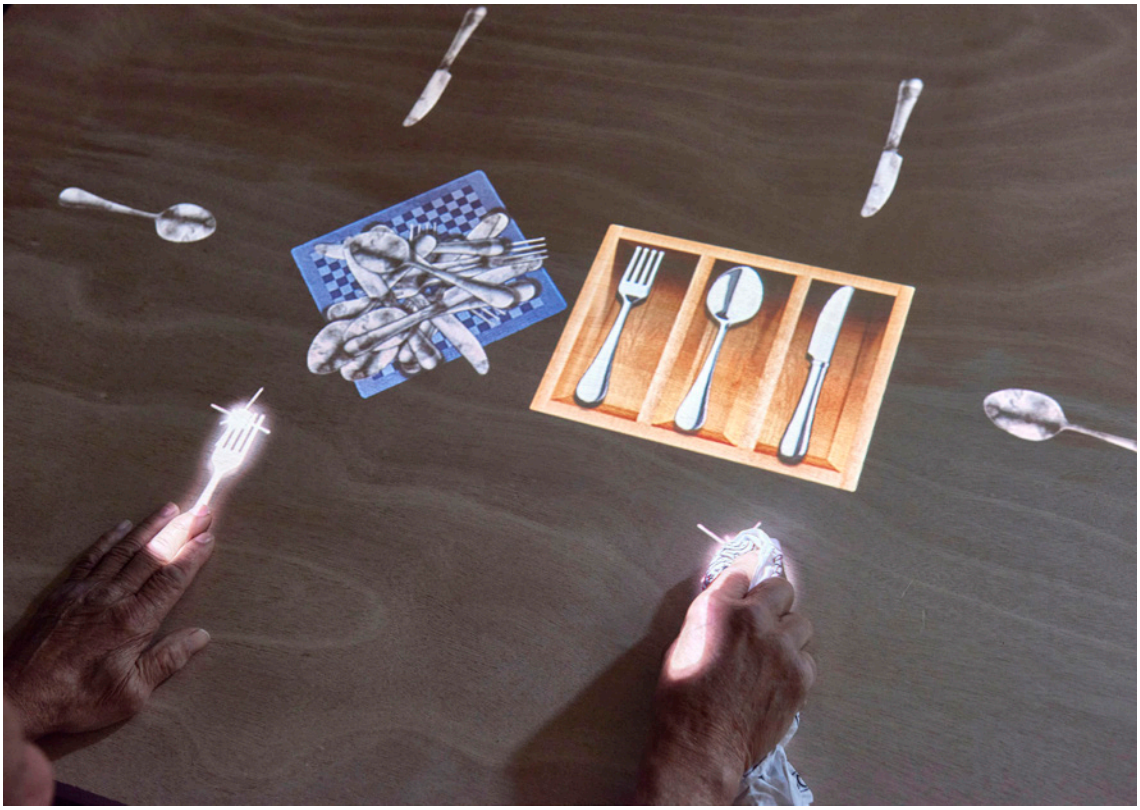
intermezzo

SUSTAINABILITY

The video games industry has both a positive and negative impact on the topic of sustainability. On the one hand, a major impact is the energy consumption of gaming devices and servers which contribute to carbon emissions. Additionally, the production and disposal of gaming devices (consoles, computers, and mobile phones) also have an impact on the environment. On the other hand, video games are a very suitable medium to create more awareness about environmental issues. Both applied and entertainment games feature environmental themes, such as the impact of climate change (Horizon Forbidden West - Guerrilla Games[1]) and reforestation (Birthplace - Little Chicken Game Company and Studio Birthplace[2]). Games can educate and inspire players to take action in real life.

FIGURE I
SUSTAINABILITY POLICIES OF DUTCH GAME DEVELOPERS





Tovertafel (Magic Table) – Tover

In the Games Monitor Survey, Dutch game developers were asked about their policies around sustainability (see Figure I).

One-third of the respondents are very much aware of the impact of their actions on the environment and take this impact seriously during the entire development process. Twenty-one percent of the respondents are aware of the issues but do not know where to start. Fourteen percent are not engaged with the topic. Overall, this seems comparable to the worldwide games industry.[3]

More specifically, we see discussions in the Dutch games industry slack channels about the impact of traveling and the reasons for attending an international event. Developers are considering which events are most useful, can be combined with other business meetings, whether it is necessary to attend an event each year or less frequently, or are considering taking the train instead of a plane (when feasible). Some other measures that were mentioned in the category 'other' are using renewable energy and choosing vegetarian options for instance. Additionally, in the discussions about cryptocurrencies and blockchain technology, energy use and environmental impact get a lot of attention.

All in all, the Dutch video games industry has taken small steps to reduce the environmental impact, but there is a lot of room for further improvements.

Notes

1 http://www.sfchronicle.com/tech/article/Horizon-Forbidden-West-SF-climate-apocalypse-16946045.php
2 http://www.littlechicken.nl/game/birthplace/
3 For instance: GDC (2022) State of the industry

Arid – Sad Viscacha Studio (Breda University of Applied Games)

GAME EDUCATION IN THE NETHERLANDS

Since 2012 the Games Monitor keeps track of game education in the Netherlands. Through desk research and a survey, we gathered insights into the state of the educational landscape in game education. Furthermore, a roundtable discussion was organized by the Dutch Games Association in May 2022.

5.1 NUMBER OF PROGRAMS

There have been a couple of noticeable trends in game education in the past years. It seems that the peak for specific game education programs has diminished. The first game development courses were offered around 2002-2004 and in the following years, many other schools followed suit with their game design courses. In 2018, we counted 44 game-related programs including all educational levels (Research Universities, Universities of Applied Science, and vocational education) and another 22 minors and abridged courses. Conversely, we noticed a trend that game education became integrated as part of a broader program, such as Multimedia Design.

This trend has continued in the past years on all educational levels. The total number of full-time game-related educational programs is now 28 and we counted only 13 minors. Among schools, there is a large variation concerning the focus of the curriculum. Certain software development educational programs hardly spend time on games. Others include it as a large part of their curriculum and offer game development as a specialization in the later stages of the

TABLE 5.1

NUMBER OF EDUCATIONAL PROGRAMS

(Source: Dutch Game Garden)

GAME EDUCATION BY KNOWLEDGE INSTITUTION	Full-time: Majors & Masters 2021/2022	2018	Part-time: Minors	2018 minors & courses	Total
Research University	2	5	3	11	5
University of Applied Science	14	17	10	11	24
Vocational Education	12	22	-	-	12
Total	28	44	13	22	41

program. We used this as part of our selection criteria: in our analysis, we only include programs where game development is listed as a large part of the curriculum; schools that offer at least a minor or a specialization in a game-related profile are included. Schools that only offer a course or some courses (less than a minor) are not included.

At the vocational level (MBO in Dutch) we saw the largest decrease in game-related programs. A few vocational schools still offer a heavily focused game development program, but a large number of schools that previously offered game development programs, now have chosen the broader approach of teaching software development. This is in line with the new qualification codes used on a national level (similar profiles are clustered together). Likewise, a game artist's educational profile is now part of the category of media designer. This was ascertained by reviewing the websites of the different schools to see which subjects, topics, or job perspectives they describe for their educational programs.

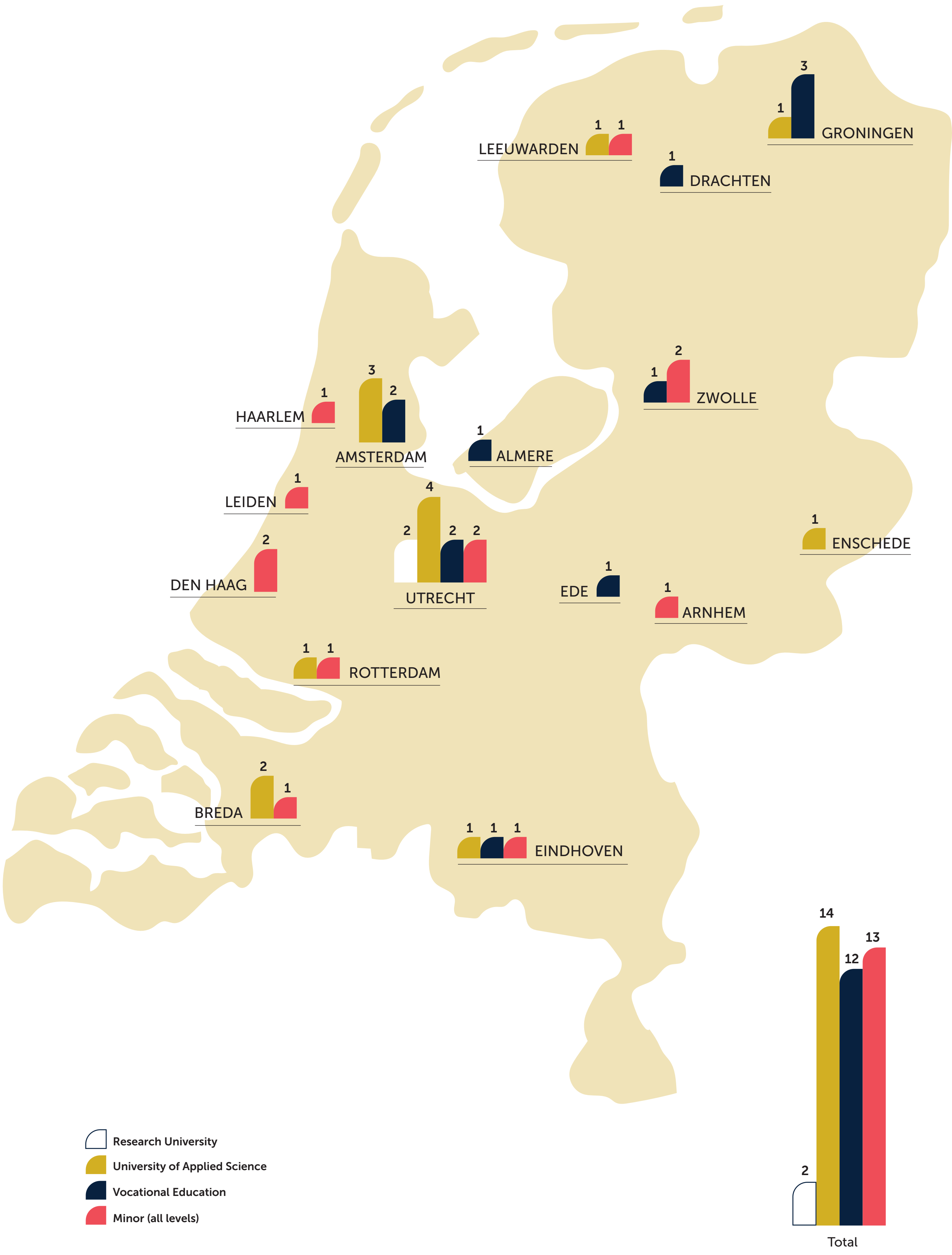
Similar to the vocational level, the qualification codes for Universities of Applied Sciences (HBO in Dutch) have also been updated. Creative Media and Game Technologies is the 4 year bachelor degree title (CROHO in Dutch) which is most relevant for game designers and developers. Five schools have been accredited to use this name for their program. These include the longest existing and well-known game programs at HKU: University of the Arts Utrecht and Breda University of Applied Sciences (BUAS). The other three are Hanze University of Applied Sciences Groningen (Hanze Hogeschool Groningen), Saxion (University of Applied Sciences) and Rotterdam University of Applied Sciences (Hogeschool Rotterdam). Some universities offer a specialization in game development from an ICT perspective.

At the research universities, we also noted a decrease in the number of educational programs. The Game Studies program at the University of Amsterdam (UvA) is not offered anymore. However, there are still some courses available. At Utrecht University (UU) a minor in game studies is still available (including collaboration in student projects with the HKU), the broader New Media and Digital Culture program does include games but is not specifically focused on games. The Computer Science department at the UU does provide a bachelor in Game Technology and a master in Game and Media Technology.

Note, however, that several research universities have an extensive research program focused on games, but don't offer a specific bachelor or master around games. The University of Delft and Technical University of Eindhoven are examples.

FIGURE 5.1

EDUCATION MAP OF THE NETHERLANDS



All Hands on Deck – Studio Mantasaur

GAMEducation LLC compares the quality of bachelor programs on game design and development, the BUAS program receives a very high rating based on career placement and student projects. BUAS scored third place worldwide in 2022.[1] HKU Games & Interaction is currently a 'topopleiding' (Keuzegids).

5.2 OUTFLOW OF STUDENTS

The annual outflow of all game students in 2021 was approximately 700. This number consists solely of the number of graduates from full-time game-related educational programs. Due to the lower number of specific game-related programs, the number of graduates has decreased as well. Exact numbers concerning student delays due to COVID-19 are unavailable.

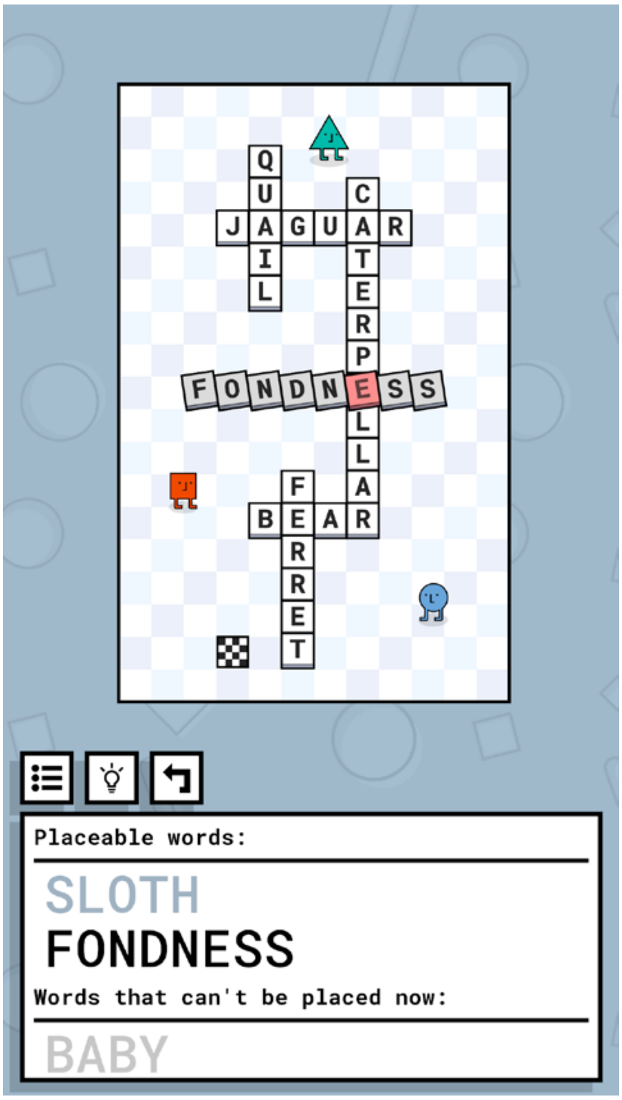
On average, many students were able to find internships. Educational institutions in Groningen, Amsterdam, and Breda mentioned that it at times was difficult to find enough available and suitable positions in the region. This can be due to many students preferring to find an internship close to home and expectations (both from students and companies) concerning the type of internship position. Certain students also find the step to find an internship quite daunting, which can contribute to a delay in applying.

The quality of work showcased by graduates has remained high and job opportunities in 2021/2022 are also favorable. The majority of graduates find a job in the games industry or related creative or ICT industries. There also seem to be more students initiating startups compared to a few years ago.

The educational landscape provides a wide range of opportunities for students who are interested in developing their skills and network, and entering the job market. There has been a shift in focus for some universities and vocational education to integrate previous game studies into the broader ICT or media sector.

Notes

1 http://www.gameschools.com/home



Wurdweb – Adriaan de Jongh & Aran Koning

Horizon Forbidden West – Guerrilla Games

BROADER IMPACT OF THE GAMES INDUSTRY

Previous chapters focused on the economic impact of the video game industry in the Netherlands. However, the impact of video games is much broader. First, the economic impact is much larger if one includes companies just outside the scope of our research, with a large spill-over effect to other sectors due to innovations developed in the video game industry. Secondly, video games have a substantial cultural and societal impact. A few examples of the added value of these sectors, along with a further specification of the difference between them, will be provided below.

6.1 LARGER ECONOMIC IMPACT

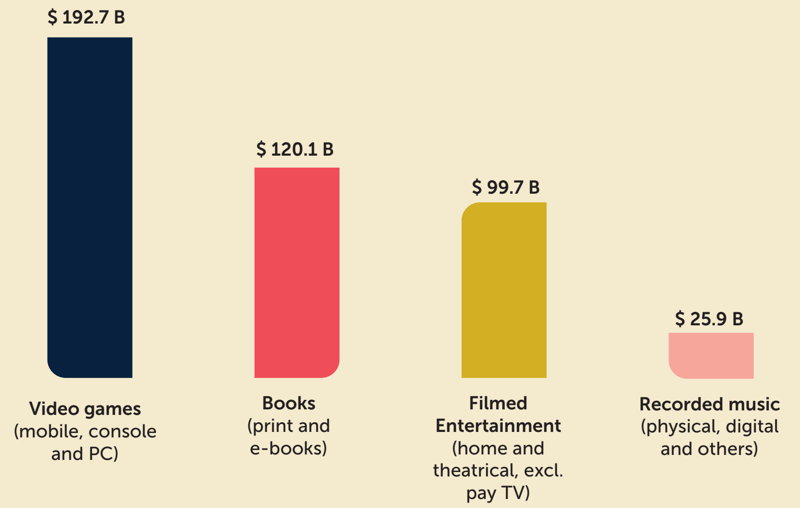
Development, distribution, publishing, or related activities around digital video games need to be a core activity of the company to be included in the research population for the Games Monitor.

Many organizations that are active in the applied games industry (clients, corporates, educational institutions, and research institutes), were excluded from our analyses. Clients can range from advertising agencies, hospitals, and the Ministry of Defense to several public authorities and training agencies. In many cases, these companies are often already active in domains for applied games, such as education, health, and marketing. They use games or elements of games to enrich their product portfolio ('gamification') but are not a game company. In such cases, game development is not the core business of the company, but a secondary activity. For example, an advertising company may develop a

FIGURE 6.1

ESTIMATED GLOBAL REVENUE FIGURES FOR SEVERAL ENTERTAINMENT SECTORS

Source: www.statista.com/chart/22392/global-revenue-of-selected-entertainment-industry-sectors/



campaign on social media that includes a game. The same goes for a museum that develops an online game for its visitors or Philips that employs an in-house group of game developers for its health product portfolio. Other examples include the military or corporate organizations that develop games in-house as part of their training programs.

Immersive technologies are growing rapidly in use in several industries. Not all applications are perceived as games as they lack a meaningful form of interactivity. Simulations in contrast are very interactive but are a very strict representation of reality and lack a form of entertainment and game elements. Another example is e-learning. E-learning companies have learning and education as primary goals and use games as part of the e-learning concept. The e-learning concept is not an electronic game.

All in all, we see a growing number of sectors where games are used for training, awareness creation, or other purposes.

It is important to realize as well, that some students who follow majors, minors, or courses around game development subjects are not directly employed in the games industry. A large number of them get a job in surrounding fields of expertise where they apply their game knowledge to other domains and disciplines.

6.2 CULTURAL IMPACT

Games are a very important bearer of cultural identity, as books, music, and film have been for years. It can be argued that the cultural impact of games is rapidly surpassing the other creative industries. Compared to other industries in the entertainment domain (see Figure 6.1), video games are the largest entertainment medium. Video games are expected to continue to grow in the coming years, making it even more dominant in the creative industries.

Dutch video games are an important cultural export product for the Netherlands since most games are exported worldwide. Dutch video games are internationally renowned for their idiosyncratic themes and innovative designs.

The last few years have shown an increase in crossovers between entertainment industries. IPs have expanded to other media including several game IPs which have been adapted to television series or movies (for example The Last of Us and Mario). This will likely happen more often in the future. Horizon Forbidden West is the largest media production in The Netherlands at an estimated budget of more than €200 million during a five-year development period.[1] A Horizon TV series is currently being developed by Netflix, the first Dutch video game to be adapted.

6.3 SOCIETAL IMPACT

During the COVID-pandemic, people reverted to playing games for many reasons. For some, it was a way to escape the harsh reality of all the challenges surrounding lockdowns etc. For others, it was a great way to keep in touch with friends and family. For example, teenagers used Roblox as an alternative schoolyard.

In general, many people recognize the benefits of playing games. Digital games can:

- Create an active, interactive, and immersive experience and narrative (compared to passive reading or watching a television series);
- Be used to practice several 21st-century skills, such as problem-solving and critical thinking;
- Are an excellent way to cooperate with other people or to communicate with people from diverse backgrounds;
- Help native and non-native speakers acquire new language skills;
- Enhance spatial awareness and hand-eye coordination;
- Help create awareness around societal challenges;
- Create connections among different generations and cultures;
- Be a didactic and reflective tool.

6.4 INNOVATION

The games industry is a pioneer in the development and application of new technologies. Technologies originally developed for games find their way into other industries. Some of the most notable innovations include:

- **Graphics:** Video games have pushed the boundaries of what is possible in visual realism and detail. The video game industry has been at the forefront of developing and implementing new graphics technologies and Graphics Processing Units (GPUs), such as 3D graphics, advanced lighting and shading, real-time rendering, and realistic physics. Developed for immersive gaming GPUs have enhanced graphics rendering and visualization across industries like film, architecture, and design.
- **Game engines:** The video game industry has developed and refined game engines, which are software frameworks that game developers use to create games. These game engines have been used to create not only video games but also other interactive experiences such as virtual reality, augmented reality, simulations, and digital twins in other industries like architecture, film, and education.
- **Virtual (and Augmented) Reality:** Virtual reality (VR) technology has been used in video games for decades, but it's only in recent years that VR has become more widely available and accessible. The video game industry has been a major driving force behind the development of VR technology. The past few years have shown a rapid adoption of VR technologies in other industries.
- **Artificial Intelligence:** Video games also are fertile ground for Artificial Intelligence (AI) development. Games often require complex AI algorithms for non-player characters (NPCs) to exhibit credible behavior. Creating dynamic, adaptable NPC behavior requires advanced AI techniques, considering pathfinding, decision-making, reaction to stimuli, and game condition changes. These AI innovations have found applications in, for instance, autonomous vehicles, predictive analytics, and personal assistants like Siri and Alexa.
- **Streaming and Cloud gaming:** Cloud gaming allows players to stream games over the internet rather than play them on a local device. This has propelled the growth of cloud computing and high-speed internet due to their demands for scalability, low latency, and high bandwidth. This relationship has improved service quality

Hix – Gamedia

and accessibility and advanced the development of cloud technologies and internet connectivity.

- **Motion sensing:** The video game industry has also been a driving force behind the development of motion-sensing technology, such as the Nintendo Wii's motion controller and the Microsoft Kinect. This technology has been used in games to create more immersive and interactive experiences and has also been used in other industries, such as healthcare and fitness.
- **Virtual Economies:** Video games have pioneered in business models, for instance, the concept of virtual economies. Within these digital landscapes, players can participate in the buying, selling, and trading of virtual goods using real-world currency. This in-game economic model has been a pioneering force in the world of finance and digital asset ownership. The principles of these video game economies have significantly influenced the development and adoption of cryptocurrencies and blockchain technology, resulting in a revolutionary shift in our understanding and handling of finance. These technologies have opened up new avenues for trade, investment, and wealth generation.
- **Gamification:** The concept of gamification, using game elements to engage and motivate individuals, has been widely adopted in various sectors, due to its effectiveness in driving user engagement and participation. In education, gamification is utilized as a tool to make learning more interactive and fun, thus enhancing student engagement and facilitating a better understanding of the subject matter. In the corporate world, gamification principles are incorporated into employee training programs to make them more engaging and stimulate participants' interest.

To conclude, the core definition of the games industry captures the economic impact of companies that include games as their core business. The overall economic and societal impact of games, however, is expected to be much higher. Games and game mechanics are adopted by companies that are active in all kinds of sectors such as education, health, finance, public safety, and energy. For these companies, games are not their core business, but they do add value to their bottom line.

Impact measurements resulting from these crossovers are not included in this study nor are indirect impacts on the ecosystem of the games industry (customers, suppliers, institutional stakeholders, etc.). To capture the true and full economic impact of the game industry, future studies should ideally include the effects of in-house game activity in other sectors and the more indirect societal impacts of gamification.

Notes

1 http://www.gamedeveloper.com/business/-i-the-last-of-us-part-ii-i-and-i-horizon-forbidden-west-i-cost-200m-each-to-make


BANANA
BANANA
7.

APPENDIX

DEFINITION OF THE GAMES INDUSTRY, DATA AND METHODOLOGY

The Appendix describes the data and methodology used to obtain the results. It includes the definition of the games industry, the selection criteria for the companies included in the games industry, and the data sources and methodology used concerning companies, employment, and turnover figures. Methodology in terms of education data selection (amount of game students and amount and type of educational programs), is also provided.

The Games Monitor focuses on the direct economic impact of the *production* of games in the Netherlands. This research was conducted using the same definition and methodology as the previous editions of the Games Monitor (2012[1], 2015[2], and 2018[3]). For this edition, search efforts were made using several data sources. We keep our database up-to-date and complete to the best of our knowledge. However, some companies only come to our attention a few years after they have become active. We have not corrected the data in terms of the amount of companies of previous editions that should have been included back then.

PRE-SELECTION CRITERIA AND VERIFICATION OF COMPANY ACTIVITY

We continuously improve the selection procedure of game companies and linkage with official data sources of the Chamber of Commerce and LISA based on experiences from previous editions. An additional check has been carried out to verify for the current activity of a game company:

Dormant companies not included in the sample: Companies are considered dormant if there are no known plans of present or future development and few existing assets. They may still collect (small) revenues from existing games. A Chamber of Commerce notice is available but website and social media is not recently updated and founders are also currently working elsewhere.

Companies included in the sample: Founders have a job elsewhere but still promote their games or have even launched an updated version or port to a new platform during their spare time. These are counted as active companies but not as active places of employment.

DEFINITION AND SCOPE OF THE GAMES INDUSTRY

The same definition and methodology was used as the previous editions of the Games Monitor reports. In order to measure the economic impact of the games industry, a clear definition of a game company is needed. The OECD[4] (2009) defines the content and media industry as: "Content and media industries [who] are engaged in the production, publishing and/or electronic distribution of content products".

Similarly, the games industry includes "companies that develop, produce, distribute and facilitate electronic games''.[5] Using the above-mentioned criteria, the games industry is defined as:

"All companies whose core activities include at least one of the following processes in the value chain: the development, production, publication, facilitation and/or electronic distribution of electronic games."

The Games Monitor discerns two domains in game development: *entertainment games* and *applied games*. Entertainment games entail all electronic games that have entertainment as their primary goal. Applied games, also referred to as serious games, aim to inform, educate or train end-users. Applied games are developed and distributed in many sectors, including education, health, transport, marketing, and armed forces.

Besides game *development*, the following types of actors are involved in the value chain of the games industry: game technology supplier, service provider, publisher, and distributor (see Games Monitor 2012 for a more extensive description of the value chain). Publishers should also publish games from other game developers. Service providers do not (or barely) develop games but provide services to game developers. In this edition of the Games Monitor report, we have added a category for 'specialized subcontractors'. These are mainly small companies, often one-person companies, that provide free-lance or work-for-hire services to other game developers. In contrast to service companies, specialized subcontractors are part of the development process. These subcontractors are, for instance, artists or software developers.

The current definition will be referred to as the *core definition* of the games industry because it selects a part, and not all, of the economic impacts of games activity in the Netherlands. Game development must be one of the core activities of the company to be part of the games industry.

The *selection criteria* for 'core activity' is that a significant part (at least one quarter/ one-third) of the company's turnover and/ or strategic focus should be on the development, production, publication, facilitation, and/or electronic distribution of electronic games.

NUMBER OF COMPANIES

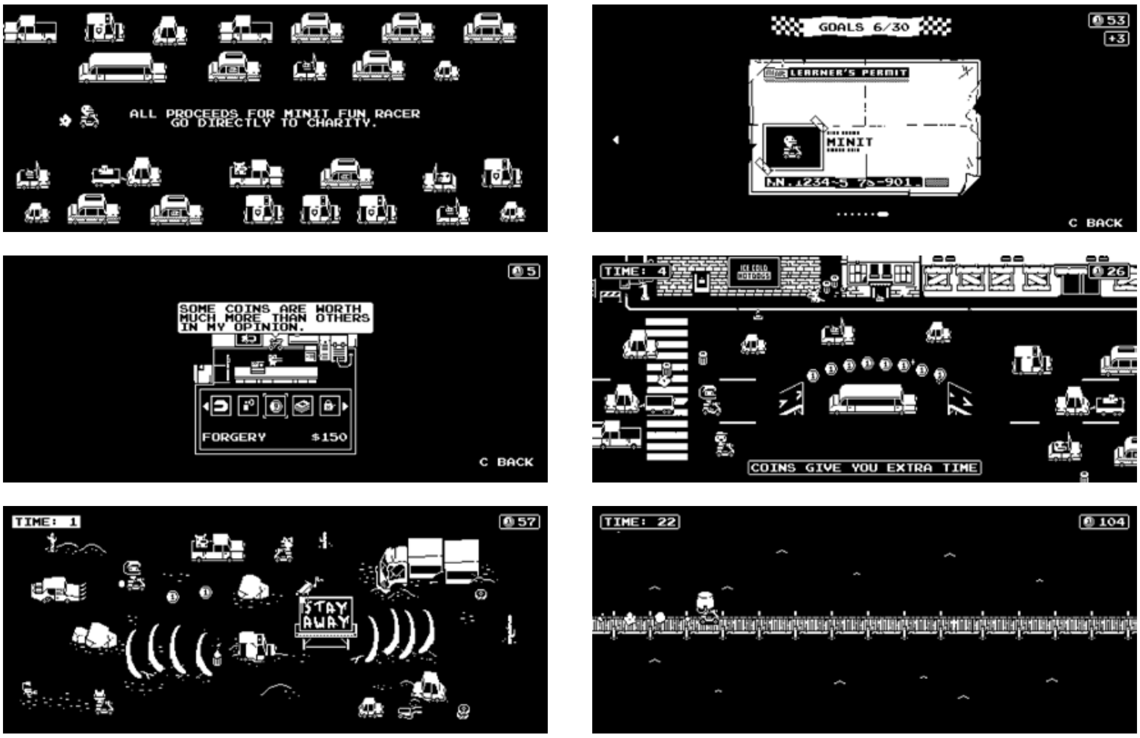
A first selection of game companies was provided via Dutch Game Garden networks and the list of game companies of the Games Monitor 2018. A more in-depth selection was carried out by including companies from other sources (newspaper articles, Dutch Game Industry Directory, Chamber of Commerce, Dutch Games Association member, NVPI members, VRbedrijf.nl, Indiedatabase, Dutch games industry slack channel, Google and LinkedIn). All companies have been cross-referenced with data from the Chamber of Commerce and verified by NEO Observatory and Dutch Game Garden using the selection criteria. The design and application of the selection criteria has been refined and improved thanks to takeaways and learnings from the previous editions of the Games Monitor.

The final list of companies is the result of a strict selection process. This led to a total of 630 game companies in the Netherlands in 2021.

The selection criteria led to the exclusion of the following:

- The development and publication of physical and analog games such as board and card games.
- Companies whose core activity is not the development of games. To be included in the criteria, a company must have a significant part (at least one quarter/one-third) of the company's turnover, and/or strategic focus should be from the development, production, publication, facilitation, and/or distribution of electronic games.
- Companies should be registered at the Chamber of Commerce and have economic activity of substance. For example, dormant companies, student projects, and hobby projects are excluded.
- Parties involved in applied games such

Habbo Hotel – Azerion



Minit Fun Racer – Kitty Calis, Jan Willem Nijman, Dominik Johann and Jukio Kallio

as clients, educational institutions, and research institutions. Clients can range from advertising agencies and the Ministry of Defense to several public authorities and training agencies. For these companies, game development is not a core activity but a secondary activity that strengthens their core activity. They often employ people, sometimes even a department, that is primarily occupied with applied games. On a company scale, however, it is an in-house and/or ad hoc activity. Therefore, these companies have been excluded from the core definition of the games industry.

- Public authorities, governments, and educational institutions do operate in the games industry ecosystem but have not been included in the core definition of the games industry.
- For the distribution of electronic (digital) games, retail is explicitly left out of the core definition.
- Online gambling is not considered an electronic (digital) game.

EMPLOYMENT

Employment figures concerning game companies are based on two main sources: the LISA Register of Employment and the Games Monitor 2022 Survey.

LISA is the most comprehensive national database including information concerning Dutch companies and branches that employ personnel. The database is closely linked to the Chamber of Commerce and includes information on location (address) and socio-economic data (employment by type of economic activity).

We have used the latest available data from the LISA register from May 2022. Some game companies (19 in total) have separate entities and/or more than one location in the LISA register. These entities are all counted as separate game companies and have been included in the total tally. This has led to the addition of 39 companies to the list. There are also 27 game companies with no substantial labor activity (at least one person should work for 12 or more hours per week in the company). These companies have zero employment.

In case the two main sources do not provide consistent information, the company website and/or LinkedIn is checked for employment information. For all game companies, information was found in one of these sources. In contrast to the Games Monitor 2015, no additional employment estimations were needed.

REVENUE

The revenue of game companies is estimated based on the employment information and data of revenue per employee from CBS National Accounts of similar industries (IT, Advertising agencies, publishing, wholesale, and design) and the Games Monitor 2022 survey.

The Games Monitor 2022 survey was used to verify the results. A total of 136 companies (representing 22 percent of the total number of game companies) filled in the revenue questions of the survey. For a few companies, other public sources were used, such as public annual reports or information about revenue in a press release concerning a merger or acquisition. The results of the survey by firm size and specialization in the value chain are compared with the results of the Games Monitor survey. Due to the limited information from game companies and the high heterogeneity in turnover and profits per company, we have decided to publish the results on revenue in a range.

GAME EDUCATION

Desk research was carried out in 2022 by compiling a list of active game-related educational programs in The Netherlands. The desk research was based on the previous Games Monitor research efforts and was complemented by nationwide educational databases and institute websites.

The information and data in the chapter *Game Education in The Netherlands* was based on a survey that was sent out to all educational institutes in The Netherlands with a focus on game-related education. The survey was used to compile the number of game graduates, to collect general information about Dutch game education, and to analyze trends and challenges in Dutch game education. For some schools, the number of students was estimated based on previous data. Also, insights obtained from a round table organized by the Dutch Games Association in May 2022 were used for this chapter.

Notes

1 Koops, O. & T. Bachet (2012), De Nederlandse gamesindustrie in cijfers, In: Taskforce Innovatie Utrecht (2012) – Games Monitor 2012, Utrecht.
Can be retrieved from: http://www.dutchgamegarden.nl/project/games-monitor/

2 Dutch Game Garden (2016), Games Monitor The Netherlands 2015, Utrecht: Dutch Game Garden
Can be retrieved from: http://www.dutchgamegarden.nl/project/games-monitor/

3 Dutch Game Garden (2019), Games Monitor The Netherlands 2018, Utrecht: Dutch Game Garden
Can be retrieved from: http://www.dutchgamegarden.nl/project/games-monitor/

4 OECD. (2009). *Guide to measuring the information society.* OECD/OCDE

5 Games Monitor 2012

GAMES MONITOR 2022 PARTNERS

MADE POSSIBLE BY