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Navigating Challenges in Indie Game Development: A Study of the Nordic-Baltic Region

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Abstract

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The market size of the videogame industry by 2023 was estimated to be 166.9 billion euros with about 3,381 million players worldwide. Particularly in the Nordic and Baltic regions, the videogame industry has emerged as a dynamic and growing sector of the economy. In Europe the industry is mostly composed of about 4,600 small and micro-organizations providing employment to almost 100,000 people. Indie game developers are small teams or single individuals dedicated to videogame development without having financial or structural support from a publisher or group of external investors which in some cases might hinder their opportunities of success.

This thesis, commissioned by Kajaani University of Applied Sciences (KAMK), acting as the coordinating institution for the Nordic/Baltic Network for Game Development (NoBaN) explores the state of the indie game development ecosystems within the region by mapping the challenges that indie developers face and how the existing public policies, academic contributions, and industrial connections can influence sustainable growth. The study draws on a review of literature, policy documents, and industry reports, combined with a qualitative, multiple-case study approach based on twelve in-depth interviews with developers from Finland, Norway, Estonia, and Latvia. Despite the local differences across the four countries, the main challenges identified are the limited support mechanisms that minimize financial resources impeding full time dedication for the projects, limited business and managerial skills, lack of specialized incubators and accelerators, difficulty finding co-founders and lack of recognition of the industry.

A series of recommendations and areas of focus are presented, that includes the elaboration of a comprehensive guide of financial resources available for indie developers, strengthening and developing sponsorship opportunities, improving and expanding the communication channels beyond Academia, developing specialized incubators and accelerator programs and establishing programs of legal support to assist developers with contractual and legal matters. Additionally, it advocates for the formal recognition of the producer role in indie teams and calls for a more refined societal and institutional perception of videogames as both cultural artifacts and viable business ventures.

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Glossary

AAA - Videogame with a large scale and budget

AI - Artificial Intelligence

AR - Augmented Reality

ARPDAU - Average Revenue per Daily Active User

BGI – Baltic Game Industry

DMA – Digital Media Act

DLC – Downloadable Content

DRM - Digital Rights Management

EMTAK - Estonian Classification of Economic Activities

EUAS - Estonian Entrepreneurship University of Applied Sciences

FPS - First Person Shooter

GCI - Global Competitiveness Index

GDP - Gross Domestic Product

GEI - Global Entrepreneurship Index

IAA - In App Advertising

IAP - In App Purchase

IGDA - International Game Developers Association

IP - Intellectual Property

LSIA or LGDA - Latvian Game Developers Association

MAU - Monthly Active Users

MOBA - Multiplayer Online Battle Arena

MMORPG – Massively Multiplayer Online Role-Playing Game

NACE - Nomenclature Statistique des Activités Économiques dans la Communauté Européenne (Statistical Classification of Economic Activities in the European Community)

NES - Nintendo Entertainment System

NoBaN - Nordic/Baltic Network for Game Development

NTNU - Norwegian University of Science and Technology

Paid Games / Premium Games - Games that have been purchased by a price more than 0, in whichever currency corresponds.

RTS - Real Time Strategy

TBA – To Be Annouced

TPS - Third Person Shooter

UGC - User Generated Content

UMD - Universal Media Discs

VC – Venture Capital

VR - Virtual Reality

XR - Extended Reality

YoY - Year on Year

1 Introduction

The videogame industry has experienced exponential growth over the past few decades, becoming a key contributor to the global economy. By 2023, it is projected to generate approximately 165 billion euros in revenue (Newzoo, 2024, p. 17) duplicating the combined revenue of other entertainment industries such as film and music in the same period (Xsolla, 2024, p. 43). This growth is driven by an estimated 3.3 billion players worldwide (Newzoo, 2024, p. 18) spanning across all generational groups (Xsolla, 2024, p. 38). In Europe, the videogame industry accounts for 18.3 billion euros, representing around 11% of the global market (Hiltunen et al., 2024, p. 4) nevertheless this share has seen a decline of almost 9% since 2017 (European Commission, 2023, p. 53). Furthermore, the global videogame market is dominated by companies established outside the European Union, with approximately 80% of the 4,600 videogame companies operating within Europe are classified as small or microenterprises (European Commission, 2023, p. 57). Despite their limited budgets and small team sizes, these developers have had a significant impact on the industry by pushing the boundaries of game design and storytelling through innovative approaches and creative freedom (Shorooq Partners Gaming, 2023, p. 8).

Particularly in the Nordic and Baltic regions, the gaming industry has emerged as a dynamic and growing sector of the economy. These regions benefit from strong technological infrastructures, start-up ecosystems and a culture of innovation, providing a unique environment that facilitates growth opportunities for independent developers (European Commission, 2024b, p. 19). However, despite the creative potential and enthusiasm surrounding indie games, independent developers often face several challenges that hinder their success. These challenges include securing adequate funding (Ecorys & KEA, 2023, p. 29) and navigating complex bureaucratic and legal frameworks (Lehonkoski, 2022, p. 54). Strengthening support structures is crucial in providing additional impulse to local developers and publishers ensuring that they can thrive within the competitive market (Hiltunen et al., 2024, p. 36).

The Commissioner of the Thesis is Kajaani University of Applied Sciences (KAMK), which operates as the Coordinating Institution within the Nordic/Baltic Network for Game Development (NoBaN) during the first year of the program. This initiative involves five academic institutions from Finland, Estonia, Norway and Latvia all of which are focused on improving the game education landscape in their respective countries by enhancing the competitiveness and skillset of both Master's and Bachelor's program students. The participating institutions are University of Tartu (Estonia);

The Arctic University of Norway, UiT (Norway); Tvibit (Norway); Latvian Technological Center (Latvia) and KAMK (Finland). The program started in September 2024 under the Nordplus Higher Education initiative and within the program, a wide range of strategies have been arranged. These include seminars and conferences, networking events, joint publications and a virtual collaboration platform among the participating institutions.

In this context, the aim of this thesis is to bridge the existing gap in the literature regarding the current state of the indie game development industry, specifically within Norway, Estonia, Latvia, and Finland. The research seeks to map the challenges faced by indie game developers in this region, investigate the role of the entrepreneurial ecosystem and the interaction between academia, industry, and government in influencing the success of indie developers in these regions in their success.

The main research question addressed by this thesis is:
What obstacles do independent videogame developers encounter during the development process in Norway, Estonia, Latvia, and Finland?

The sub-questions considered are:
1. What are the primary sources of funding for independent videogame developers in these countries, and what challenges do they face in securing investment?
2. What role do support systems such as incubators, accelerators, and mentorship programs play in the success of independent videogame developers in these countries?

Methodologically, this thesis adopts a pragmatic approach, and an abductive reasoning process, allowing for the iterative development of theories based on empirical data. The research method selected for this study considers a qualitative method that consisted of collecting data through semi-structured interviews with twelve indie developers, industry experts, and representatives from academia and support organizations. The material gathered from these interviews has been analyzed according to the thematic analysis method using the theoretical framework as a main reference.

The theoretical framework of this thesis is based on three key models. The Triple Helix Model of Innovation (Etzkowitz & Leydesdorff, 1995) examines the complex interactions between academic institutions, industry, and government and their impact on economic and social development. Universities contribute research and knowledge creation, businesses focus on applying this knowledge to develop products and services, while governments provide policy support, funding, and regulations that enable innovation.

The Entrepreneurial Ecosystem Theory (Cohen, 2006) extends this framework to include additional stakeholders, such as access to capital, availability of talent, and a culture that encourages risk-taking and innovation highlighting how regional and local conditions play a crucial role in entrepreneurial success. The Community of Practice, a concept initially developed by Lave (1991) and deepened by Wenger (1999), explains how the knowledge is shared across groups of people that share a common interest and interact with each other actively.

The findings of this research were largely in line with the researcher's expectations. The primary challenges identified include a lack of structured financial support, which limits developers' ability to commit fully to their projects; limited business and management skills; and the absence of specialized incubators and accelerators in most of the countries studied. Based on these factors, this study offers a set of recommendations for the NoBaN Network aimed at mitigating these challenges and promoting a more sustainable, supportive ecosystem for indie developers. While the recommendations are intended to guide stakeholders and policymakers, the researcher ultimately hopes that the primary beneficiaries will be the developers themselves. Additionally, this research contributes to the growing academic discourse on creative entrepreneurship and indie game development by offering context-sensitive policy and industry recommendations aimed at enhancing the sustainability and global competitiveness of the Nordic-Baltic game development ecosystem.

Chapter 2 presents a brief overview of the Videogames and their development process, while Chapter 3 outlines the current state of the Videogame Industry in Europe as well as an overview in each of the four countries that are the target of this Thesis. Chapter 4 introduces the Theoretical Framework for this thesis and Chapter 5 describes the Methodology of the research. Chapter 6 gives a detailed analysis of the empirical results while in Chapter 7 the Conclusions and recommendations are presented.

2 Videogames and their development process

Play is an integral activity to the social development of all mammals although the development of a cultural expression of play and therefore games, are unique to humankind (Costikyan, 2013, p. 5-6; Cerezo-Pizarro et al., 2023, p. 2). A game can be described as an artificial conflict that involves the participants engaging through a defined set of rules and with measurable goals (Salen Tekinbaş & Zimmerman, 2004, p. 11).

Some scholars define videogames as an electronic variation of the game activity (Nguyen & Bavelier, 2023, p. 1) that to be played require a video monitor or screen (Suvak, 2014, p. 1) and are characterized by their interactive nature representing a form of narrative or interactive fiction (Tavinor, 2008). Other researchers establish that videogames should possess additional characteristics such as goals, challenges and conflicts between players and if such goals are not present, should be considered as mere toys with embellishment as their unique purpose (Crawford, 2003, p. 7).

The relationship that is provoked by the videogame, motivates the gamer to position himself beyond the role of a mere observer (Roig et al., 2009, p. 94) while at the same time bounding him to alternative worlds with their own rules and limitations (Nguyen & Bavelier, 2023, p. 1). In juxtaposition to other forms of entertainment, videogames require the player to engage in the interaction (Granic et al., 2014, p. 67) setting the experience of play as the core element in the audiovisual experience (Roig et al., 2009, p. 94).

Videogames implement failure at the core of the motivation strategy to achieve a long-term success: finish the game (Granic & Engels, 2014, p. 71). The players are motivated to try different alternatives and strategies when facing a challenge and, when the gameplay is properly balanced, players face these challenges with growing interest and excitement. According to Granic and Engels (2014, p. 71), this approach leads to a motivated and persistent mindset that can be extrapolated to other spheres such as academics or work life.

The role of storytelling in videogames has evolved significantly in recent years, with a growing focus on personal, emotional narratives (Haggis, 2016, p. 21). Roig et al. (2009, p. 100) delve into the social practices underlying the communities connected through videogame interactions. The videogames can then be seen as a broader social practice that considers the communities sharing identity values and the role of reproducing symbolic worlds. For Cerezo-Pizarro et al. (2023, p. 3) videogames have a substantial impact on the cultural transmission and assimilation due to their allegorical character. They are responsible for creating a particular space and niche, featuring specific rules, ethics and terms while generating specific elements (Horban et al., 2019, p. 133).

However, videogame's impact can go beyond mere entertainment. The study presented by Desai et al. (2021, p. 573) reflects on the impact of playing a casual videogame as a strategy to reduce stress: the researchers were able to prove a correlation between stress reduction and videogame activity, particularly helpful when targeting a younger population while other studies have used videogames to rehabilitate patients with Parkinson's Disease (Patel & Sharan, 2020; Kafle & Rizvi, 2021) or improve physical skills on elderly patients (Afridi & Nazir, 2021).

Due to the diversity in genres, creating a comprehensive classification system for modern games is particularly challenging (Granic et al., 2014, p. 67). Several aspects such as the general theme or game play can be used as a baseline for the classification although it might change entirely if a different aspect is considered (Burgun, 2012, p. 95). In Table 1 the authors Nguyen & Bavelier (2023, p. 9) present a general categorization of videogame genres with a prevalence of the action component in the gameplay as well as some examples for each of the mentioned genres. The games are classified in eight distinct genres that reflect their core gameplay mechanics and themes. The genres identified include First-/Third-person shooters (FPS/TPS), Action-Role playing games (RPG)/Adventure, Sports/Driving, Real-time strategy (RTS)/Multiplayer online battle arena (MOBA), Turn-based/Non-action role-playing/Fantasy, Turn-based strategy/Life simulation/Puzzle, Music, and a final category "Other" that includes mobile and browser games as well as fighting games.

Game genre	**Examples**
First/Third Person shooter (FPS/TPS)	Call of Duty, Half Life, Apex Legends, Halo, Overwatch, Counter-Strike.
Action-Role playing game (RPG) / Adventure	Elder Scrolls, Myst, The Witcher, Mass Effect, Fallout 4, GTA, Assassin's Creed, Tomb Raider, The Last of Us.
Sports / Driving	F1, Forza, FIFA, Mario Kart, NHL, Need for Speed, Rocket League.
Real-time strategy (RTS) / Multiplayer online battle arena (MOBA)	StarCraft, League of Legends, Warcraft I, II & III, DOTA, Command & Conquer, Age of Empires, Pokémon Unite.
Turn-based / Non-action role-playing / Fantasy	Pokémon, World of Warcraft, Final Fantasym Divinity: Original Sin II, Chrono Trigger.
Turn-based strategy / Life Simulation / Puzzle	Civilizations, The Sims, Candy Crush, Hearthstone, Roblox, Among Us, Restaurant Empier, Puzzle Quest, Bejeweled, Solitaire.
Music	Guitar Hero, Beat Saber, Dance Dance Revolution, Rock Band.
Other (includes mobile and browser games, fighting games, etc.)	Super Smash Bros, Tekken , Street Fighter, A Dark Room, Wordle, Skribbl.io

Table 1. Game genre classification and examples. (Adapted from Nguyen & Bavelier, 2023, p. 9).

The development of videogames involves the creation of all the components of the game (Engström, 2020, p. 14). This process is often structured as a project with multiple stages or milestones, enabling the content to be iterated and refined (Zackariasson & Wilson, 2014, p. 7). Typically, it begins with a proof of concept of the core mechanics and concepts ensuring their validation before moving into full production (Burgun, 2012, p. 25; McDonald et al., 2021, p. 545).

The term indie or independent is a concept has a different definition across the literature (Garda and Grabarczyk, 2016, p. 2), in some cases defined as self-funded projects (Politowski et al., 2020, p. 553) as solo developers or very small groups (Josef et al., 2022, p. 5) or even as hobbyist approaches reluctant to focus on the financial aspect of the game (Engström, 2020, p. 13). According to Garda and Grabarczyk (2016, p. 7), an indie studio can represent either of three types of independence: financial independence (from the relationship with the investor) creative independence (from the relationship with the audience) or publishing independence (from the publisher). Josef et al. (2022, p. 7) establish four different categories of indie developers based on the size of the team: solo developer where a single individual is responsible for most of the task related to concept, coding, music and art, small teams when 2 to 5 individuals that divide the tasks although sharing responsibilities, Mid-size teams comprised of 6 to 25 developers with specialized focus and tasks and Large Teams with 26 or more developers have specializations in the development of the game.

A wide array of skills is required to develop a videogame that includes areas such as Design, Art and modeling, Programming, Sound, Quality Assurance, Production and Marketing (Scolastici & Nolte, 2013, p. 62). Several of these activities can be handled through a specialized third party, when the Indie Studio requires additional technical support in areas such as Quality Assurance, Localization, porting to a specific system and specific organizational and management activities such as Marketing, Distribution and Community Management (Josef et. al, 2022, p. 8; Hill-Whittall, 2015, p. 33). Considering the limited size of the indie development studios, selecting team members with both the necessary technical skills and the right mindset is fundamental to achieve an adequate level of cooperation and efficiency (Scolastici & Nolte, 2013, p. 63).

The videogame development considers a complex ecosystem that includes the interactions between several stakeholders and participants such as developers, players, platforms, merchandisers, gaming events, hardware developers, publishers, investors and content creators as illustrates Figure 1. Game Developers and Players are a key element in the ecosystem although the author emphasizes the relevance of understanding the complex relationships between the Platforms or storefronts where Players acquire the games, to the Content Creators that stream and offer reviews on social media and streaming platforms. All these satellite activities serve to amplify the outreach of a project and can help developers to establish a commercial strategy (Josef et. al, 2022, p. 6).

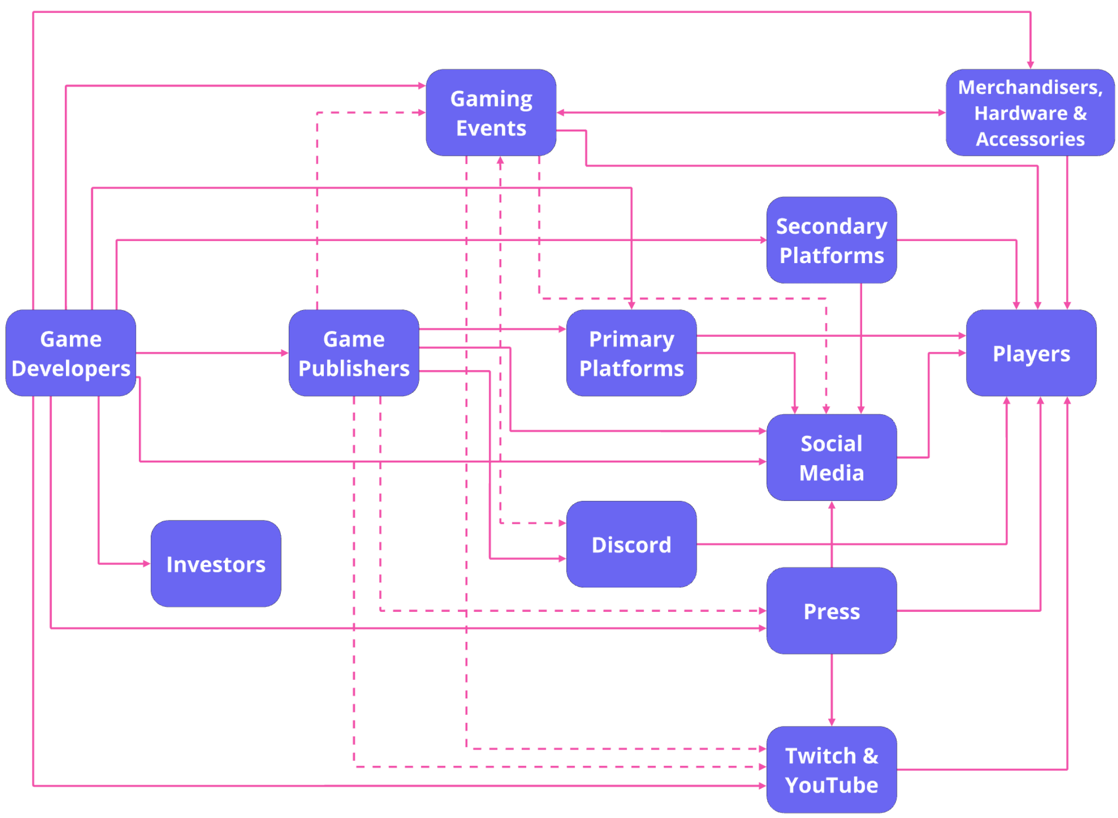

Figure 1. The Indie Game Ecosystem. (Adapted from Josef et al., 2022, p. 6).

The digital transformation that has impacted other industries has also created a significant shift in the value chains of the videogames sphere (González-Piñero, 2017, p. 23; Ecorys & KEA, 2023, p. 33; Kelly et al., 2020, p. 23). The traditional supply chain dependent on the retailers and distributors as connection to the consumer has evolved into a direct link from developer to consumer thanks to the digital distribution, as illustrates Figure 2. The retail driven value chain, representing mostly consoles and PC games requires the intervention of a Publisher, Distributors and Retailers between the Developer and Consumers, impacting the final cost paid. In the mobile driven value chain, Distributors operate as the bridge between Developers and Consumers, reducing the number of intermediaries: Retailers are no longer required to access the digital goods and the original role of Publishers as intermediaries with Distributors is discarded of the model. The Online value chain considers a direct connection between the Developer and the Consumers, setting also a more profitable pricing model for the Developer and more accessible price point for Consumers (Ecorys & KEA, 2023, p. 55).

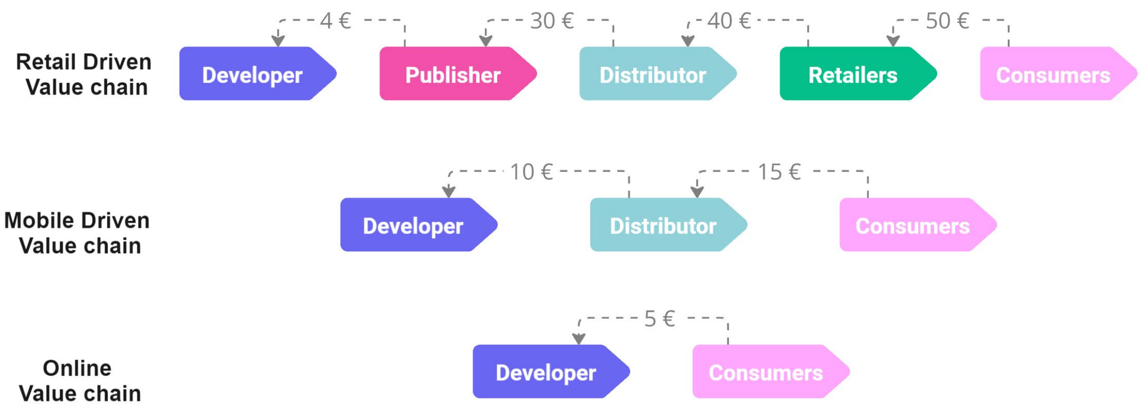

Figure 2. Supply Chain Scenarios in videogames. (Adapted from Ecorys & KEA, 2023, p. 55).

Monetization models have also evolved beyond traditional game purchases or premium games. They now include in-app purchases, where the base game is free, but users are prompted to acquire additional content or upgrades, and ad-revenue models where the game can be accessed for free but generates revenue from advertisements. Other monetization models consist of microtransactions such as season passes and loot boxes, or the subscription services to a catalogue of games (Ecorys & KEA, 2023, p. 42; Zachow, 2023, p. 24). When combined, these strategies can help prolong the life cycle of the game (Koskela, 2021, p. 31).

Furthermore, thanks to the digital platforms in live services, data analysis has become a fundamental tool in customizing the player experience, offering a balanced gameplay experience and driving user engagement (González-Piñero, 2017, p. 38; Whitson, 2019, p. 12).

The funds to develop the game can be obtained through several mechanisms or a combination of strategies that include loans, grants or support from external Investors and Publishers (Lehonkoski, 2022, p. 51; Hill-Whittall, 2015, p. 223). Investors, might provide funding to developers for either a specific project or game or to support the establishment and running of the studio while publishers tend to have an active role through constant communication with the developers, reviewing the progress throughout milestones and coordinating certain activities such as QA or Marketing (Josef et. al, 2022, p. 12).

Self-Publishing is an alternative if the developers can handle activities such as Marketing, porting to other platforms and localization. The selection of Self-Publishing should be a conscious and strategic decision considering the time limitations and demands of these activities (Josef et al., 2022, p. 13) although among the benefits of that route, more freedom and control over the creative process can be considered an important factor (Freeman et al., 2023, p. 10).

The operation of Game Incubators supported by public funding plays a relevant role in the dissemination of practical knowledge for its participants and the strengthening of networks among key stakeholders such as Universities and Technology Parks as well as providing a link between small studios and individuals to attract financing their projects. In particular, Game Incubators ease the transition between the academic life and work experience providing participants the experience and skills to build and run their businesses while facilitating access to potential investors and partners (Jensen, 2019 p. 11). Small companies and sole developers can also apply for grants and incentives which can vary from region to region and are usually aimed at providing seed capital (Hill-Whittall, 2015, p. 214) although some studies cite the increasing difficulties and competition in creative industries in general to access public funding. Crowdfunding becomes then an alternative mechanism through platforms such as Kickstarter (Demattos Guimarães & Maehle, 2023, p. 944). It is relevant to consider that planning and developing a successful crowdfunding campaign requires a considerable effort (Josef et. al, 2022, p. 13).

The alternative of early access releases has been also explored by several developers. The platform Steam allows users to add to their Wishlist those games that result interesting for them, even if the game hasn’t been officially released, notifying them when the game releases and allowing the developers to access data about the conversion rates and overview of regional trends (Dealessandri, 2020) and according to Valve, the conversion rate is 19 percent therefore this information can be used by developers to estimate profits and leverage themselves when negotiating with publishers (Josef et al., 2022, p. 37).

With the popularization of subscription services for videogames also known as Game as a Services (GAAS), such as Netflix and Xbox Gamepass, different approaches can be found in respect of the way developers are paid to participate on a particular platform. Josef et al. (2022, p. 24) describes three different approaches: A minimum guarantee where the developers are paid a defined amount for the right to distribute the game within the platform, an adjusted revenue share per download and a less common method which considers a Pay-per-hour fee. To support indie creators, Microsoft has established a Developer Acceleration Program that facilitate learning to developers that are developing on console for the first-time through webinars, supporting the porting of games and creators of underrepresented backgrounds and themes as well as providing financial support for funding prototypes (Lewis, 2023) while other subscription platforms such as

Netflix require a licensed agent with an existent relationship with the platform to submit any idea or demo for evaluation (Netflix, n.d.) which is usually out of the reach for most indie developers.

Independent developers tend to create their own IP because the cost of acquiring licenses is too high as mentioned by Chris Totten in the Independent Games Summit 2022, suggesting creators to make use of elements that are currently in the Public Domain as derivative work enriching the cultural print of the original work (GDC, 2022). Is precisely this IP an asset that can be used as a leverage when negotiating with investors that are interested in providing funds to support the development of one specific title, requiring a share of the profit of the title after is released (Jensen, 2019, p. 8; Ecorys & KEA, 2023, p. 63).

In the literature, several authors refer to the challenges that Indie game developers face which include technological barriers, limited financial support from governmental entities, bureaucracy for entrepreneurs, limited network, complex taxation and legislative systems (Lehonkoski, 2023, p. 47; Freeman et al., 2023, p. 10). Sustainability becomes then a goal for some indie studios allowing them to devote to their own projects instead of relying on contract work to cover basic expenses (Banks & Keogh, 2021, Chapter 8, p. 171).

There are several stories of videogames that had their origins as independent productions and would eventually become popular hits. *Minecraft* (Persson, 2011) is a sandbox game developed in Java by two Swedish developers that thanks to its mechanics, its blocky aesthetics and the constant interaction of the developers with the audience (Duncan, 2011, p. 2) would gain popularity selling over 300 million units by October 2023 (Clement, 2023). Duncan (2011, p. 9) also refers as a positive trait of the development of *Minecraft* to the constant updates allowing the players to act as live testers and give feedback about the changes implemented through social media.

Stardew Valley (Barone, 2016) is a farm simulation game produced by a single developer Eric Barone, in a period of 4 years gaining popularity shortly after its release on the Steam platform (Alegra, 2016). The game has been slowly ported to consoles and its gross revenue has been estimated at over 147 million euros (VG Insights, n.d.-d.). Even more, in April 2024, 8 years after its release, and thanks to a relevant free update that was released, it managed to reach a peak of 236,000 players on Steam (Collins, 2024).

More recent examples of successful indie games can be found in the release of the Swedish game *Valheim* (Iron Gate Studio, 2021) generated an estimated gross revenue of about 162 million euros (VG Insights, n.d.-b.) and was initially released as Early Access on the platform Steam with a small development team consisting of five people (Statt, 2021). *Manor Lords* (Styczeń, 2024) a medieval strategy game developed by a single individual Greg Styczeń, which despite still being in an Early Access status on the Steam platform, has generated an estimated gross revenue of 73 million euros (VG Insights, n.d.-c.) managing to sell over 1 million copies after on its first day (Jones, 2024). Despite these and many other success stories, in most cases, indie studios struggle to obtain commercial sustainability (Banks & Keough, 2021, Chapter 8, p. 171).

3. State of the Videogame Industry

To understand the current state of the Videogame Industry is important to examine financial indicators and statistics. Several companies and organizations regularly provide detailed data and insights, such as Newzoo, which offers reports through a subscription plan. The free report from NewZoo serves as a baseline in this section and is supplemented with additional sources cited accordingly. For consistency in comparison, all the data is presented in euros, using an exchange rate of 0.90 USD to EUR as of September 5th 2024.

By 2023, the videogame industry is estimated to have a market size of 166.9 billion euros. As illustrated in Figure 3, the Asia-Pacific region dominates the global games market, with 76.1 billion euros, accounting for 46% of the total. However, it experienced a slight decline of 0.2% year-over-year, indicating a potential growth stagnation. Globally, the videogame market in 2023 experienced a modest year-over-year growth of 0.5%. This corresponds to a period of stabilization in the market, with only slight increases in overall value. The Middle East & Africa region, though representing a smaller portion of the global market at 6.4 billion euros (4% of the total), shows the highest year-over-year growth at 4.6%. This indicates its emerging potential (Newzoo, 2024, p. 21).

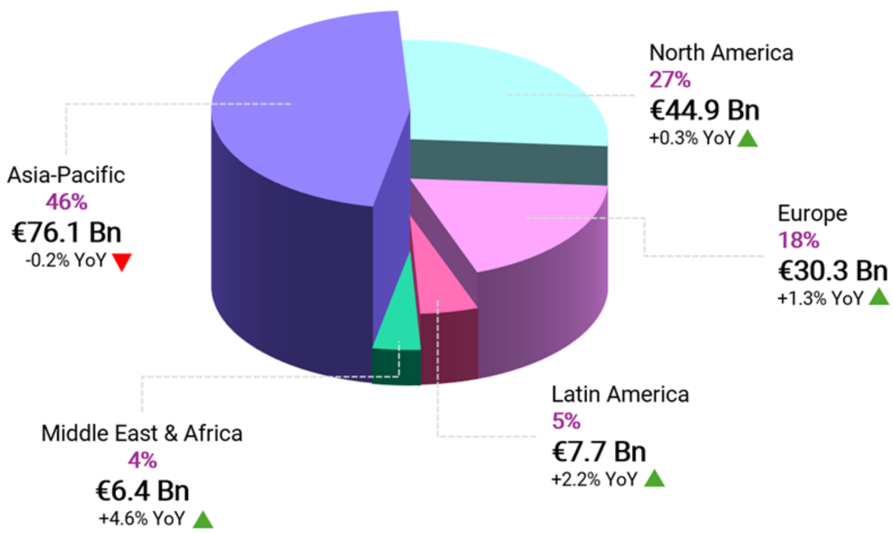

Figure 3. Global Games Market Per Region 2023. (Adapted from Newzoo, 2024, p. 20).

Regarding the number of players, it is estimated that there are approximately 3,381 million players worldwide. The Asia-Pacific region leads, with 1.73 billion players, representing 52% of the global gaming population as shown in Figure 4. Notably, the Middle East & Africa saw the highest year-over-year (YoY) growth in the number of gamers, at 11.3% followed by Latin America with a 6% increase. This growth can be attributed to improved access to affordable mobile data and a growing population with smartphones in these regions (Newzoo, 2024, p. 19).

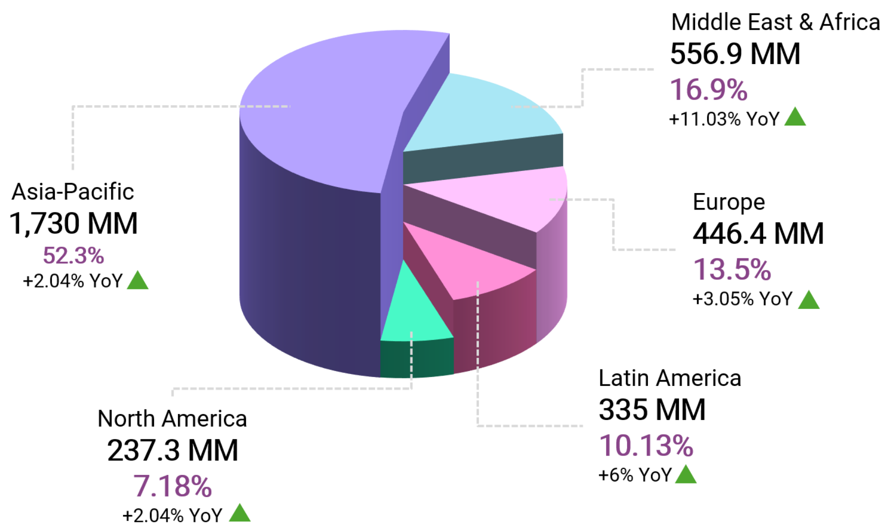

Figure 4. Global Players Per Region 2023. (Adapted from Newzoo, 2024, p. 19).

The global gaming market's revenue distribution for 2023, totaling 165.4 billion euros, with a year-over-year (YoY) growth of 0.5%. Mobile games represent the largest segment of the global games market, accounting for 49% of the total market with 80.9 billion euros although it experienced a slight decline of 2.1% YoY, followed by Console games and Downloaded and boxed PC games with 28% and 22% of the market respectively. Browser-based PC games make up the smallest share, at 1.7 billion euros (1.03%), and faced the sharpest decline (-16.9% YoY) (Newzoo, 2024, p. 20). This data is represented in Figure 5.

The global videogame market has become almost fully digital, and what used to be the norm in Mobile has also permeated to console and PC with premium games, DLCs, microtransactions, and subscription services almost fully digital, leaving the physical discs to collector's editions, this is in part to the additional costs and challenges for distribution of physical editions (Newzoo, 2024, p. 40; European Commission, 2023, p. 28) and the flexibility it allows for developers to distribute patches and updates even on day one (McDonald et al., 2021).

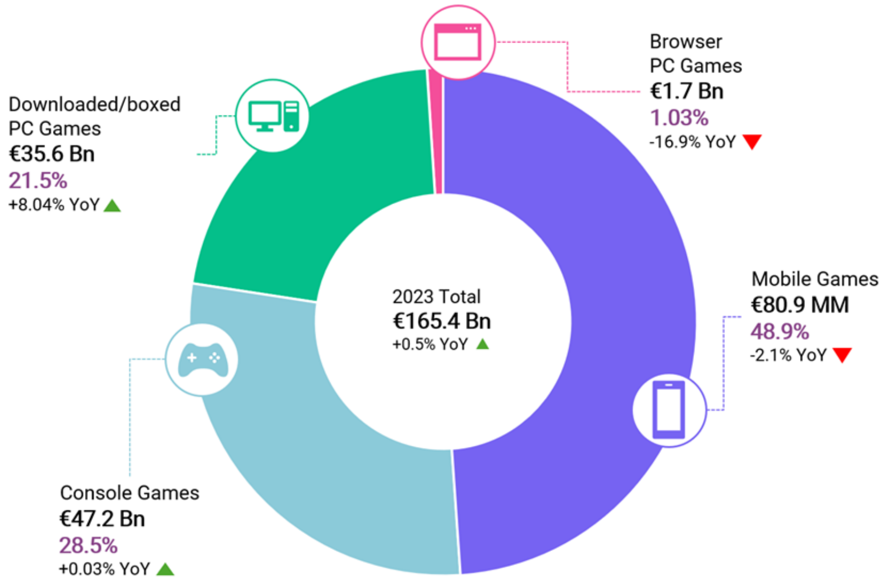

Figure 5. Revenue per Platform 2023. (Adapted from Newzoo, 2024, p. 20).

Regarding the monetization methods, the revenue of PC premium titles has decreased noticeably, and is relying more on revenue from live services and microtransactions in comparison to previous years. On a similar fashion, live services in console correspond to the 27% of the monetization and in the mobile segment it represents the undisputed monetization method with 97% of the revenue (Newzoo, 2024, p. 41).

Cloud gaming has the potential to impact the videogame industry, since the hardware or operating system become irrelevant due to the games are stored in the cloud while relying mostly on the telecommunications infrastructure (European Commission, 2023, p. 62). Cloud gaming is estimated to have 39.6 million users by 2023 and by 2026 this number is expected to reach 85.1 million users (Newzoo, 2024, p. 24).

Intellectual property is also an important resource for the videogame companies and the accompanying media. Several companies have exported their IP to either film, TV, comics or books, expanding the influence of the franchise and increasing the engagement of the audience (Newzoo, 2024, p. 18). As an example, from 2021 to 2022 the videogame adaptations increased 47% while by the beginning of 2023 around 60 productions based on videogames were in development (European Commission, 2023, p. 63).

Considering the top public gaming companies according to the report by Konvoy (2024, p. 11) Nintendo leads the ranking with 8.64 billion euros in revenue as shown in table 2; Sea Ltd follows second with 2.34 billion euros and shares this position with NetEase Games. Other companies, including Krafton, Electronic Arts, Bandai Namco, and Konami, contribute smaller amounts, while a combined group of companies (e.g., Nexon, Sega, Ubisoft) adds 9.45 billion euros to the total. On the tech side, companies with gaming divisions hold significantly larger amounts, totaling 193.14 billion euros. Amazon leads with 64.08 billion euros, followed by Meta (28.8 billion euros), Google (24.48 billion euros) and Apple (23.04 billion euros). Tencent, Microsoft, Sony, and Netflix also hold substantial amounts. This is presented in Table 2 below.

Gaming Companies		Tech Companies with Gaming Divisions	
Company	Cash & Equivalents[2] (Billion Euros)	Company	Cash & Equivalents[2] (Billion Euros)
Nintendo	8.64	Amazon	64.08
Sea Ltd	2.34	Meta	28.8
NetEase Games	2.34	Google	24.48
Krafton	2.16	Apple	23.04
Electronic Arts	2.16	Tencent	18.99
Bandai Namco	1.62	Microsoft	16.47
Konami	1.53	Sony	11.34
Others[1]	9.45	Netflix	5.94
Total	**30.24**	**Total**	**193.14**

1: Nexon, Square Enix, Sega, Ubisoft, Unity, Playtika, Roblox, TTWO, Applovin, Embracer, NCSoft. **2:** Does not include short-term investments; Source: Latest public reporting (June 28, 2024) and converted to based on historical exchange rate in that day. **3:** Original data in US$, converted to Euros based on the exchange rate by Sept 5th, 2024

Table 2. Public Gaming Companies and Tech Companies with Gaming Divisions by Q3 2024. (Adapted from Konvoy, 2024, p. 11).

3.1 State of the Industry in Europe

Although some disparities can be found among the consulted sources regarding the revenue of the videogame industry in Europe and its share in the global market, they coincide with the statement that this has been slowly declining in the recent years a phenomenon that can be explained by an accelerated growth of Asian markets (Hiltunen et al., 2024, p. 4; European Commission, 2023, p. 54).

Considering the data presented in the previous chapter, the Videogame market in Europe accounts 18,33% of the world market (Newzoo, 2024, p. 21) with countries such as France, Germany, Italy, Spain and the UK constituting 75% of the European market (European Commission, 2023, p. 54) however, Hiltunen et al. (2024, p. 4) reflects that the European Union market size is bigger than the combined turnover, which implies that there are more game imports than exports in Europe. It is for that reason that the authors reflect that to keep its current global market share in the next five years, the European Union should duplicate its current turnover. To achieve this goal, the strengthening of support structures would be fundamental to provide additional impulse to the local developers and publishers. This is particularly relevant, considering that in Europe the industry is composed of about 4,600 small and micro-organizations employing nearly 100,000 people (European Commission, 2023, p. 58) and despite a constant report of layoffs in several key organizations, the number of workers is expected to continue increasing (Ecorys & KEA, 2023, p. 98).

Hiltunen et al. (2024, p. 13) laid out that one of the biggest challenges presented in Europe is the weak distribution and publishing capability in the region given that all the biggest distributing platforms for either mobile, console or PC belong to non-European companies. The introduction of the Digital Markets Act (DMA) in Europe in May 2023 as an initiative to promote fair competition in the digital space (Digital Markets Act, n.d.), could pose an opportunity for developers to establish alternatives to reach directly the consumer, resulting in higher revenue and lower commissions (Xsolla, 2024, p. 31) with some companies analyzing the possibility to establish their own mobile stores regardless of the device operating system (European Commission, 2023, p. 62).

According to the report elaborated by the European Commission (Ecorys & KEA, 2023, p. 58) European videogame developers identified the lack of financing as the most challenging element for indie organizations, mainly due to the lack of tracked record of previous developments, usual prerequisites for traditional institutions such as banks. It is for this reason that under some circumstances, developers opt to rely on alternative funding mechanisms such as crowdfunding or grants, rely fully on self-financing or provide services to third parties to cover operational costs. It was also mentioned some circumstances when the developers are bound to negotiate financing packages with publishers in exchange for the IP. A particularly successful public initiative corresponds to Business Finland which supports Finnish developers with financial investments. It is estimated that for every euro invested in the games sector the return ranges between 9 to 26 times in the form of turnover and taxes. Additionally, other countries such as Germany, Belgium, Denmark, France, Italy and Spain have established incentive and support mechanisms to the game development communities although there are no specific State exemptions as in other cultural fields, besides some tax reductions in France with the French Tax Credit for videogames and the Irish Digital Games Tax Credit (Ecorys & KEA, 2023, p. 60).

The expansion of IP to other media is more common in other markets, although some European companies have started implementing them successfully. Such is the case of The Witcher videogame developed by CD Projekt Red and adapted as a Netflix show in 2019. In a similar fashion, the Swedish Embracer Group acquired the rights to all the IP related to The Lord of the Rings trilogy and The Hobbit by J.R.R. Tolkien for media such as movies, board games and even stage productions, looking into the opportunity to capitalize the intellectual property beyond the videogames (European Commission, 2023, p. 63).

In Europe, the videogame development sector is classified among the Cultural and Creative Sectors and Industries belonging to the European Institute of Innovation and Technology (EIT CCSI). This Knowledge Innovation Community has as a goal to promote the positioning of the EU games in international markets while fomenting diversity and embracing sustainable practices (EIT Culture & Creativity, n.d.) although the lack of a specific Statistical Classification of Economic Activity (NACE) focused on the videogame industry create inconsistencies regarding the official statistical data (Ecorys & KEA, 2023, p. 34).

A series of opportunities are mapped in the report by Hiltunen et al. (2024, p. 5), aimed to accomplish the objective and improve the positioning of the European videogame market worldwide. These actions include the exploration of innovative trends such as the use of AI, the development of tools and technologies such as middleware and game engines, the implementation of application stores supported by DMA and the promotion of specialized VC firms.

In the global scene, the capacity for funding is clearly reduced in comparison to 2021 and the landscape in Europe is not different. Although the funding from venture capital firms reduced 51% when compared to the second quarter of 2023, the number of deals increased by 32%. The largest Venture Capital deals that took place in Europe were for the companies Bespoke Pixel, a Spanish company which raised 22.7 million euros; Red Rover Interactive, a company with offices in Newcastle and Oslo which managed to raise 13.6 million euros and the French New Tales that received 8.2 million euros (Konvoy, 2024).

Another key factor that hinders the growth of the industry is the restricted access to specialized talent in the region: in some cases, the offer of professional education is limited, and the immigration regulations incorporate additional challenges (Hiltunen et al., 2024, p. 16). The nature of the business, which in many cases is project based, promotes the figure of freelancers and temporary jobs which hinders the job security of the employees and reduces the possibility of long-term training and career development (Ecorys & KEA, 2023, p. 113).

Events and development conferences are important to promote companies and projects, build networks and attract potential employees and investors. Several events take place throughout the European landscape although some worth mentioning are GamesCom (Cologne Germany); Berlin Games Week (Berlin, Germany); CPH Matchup (Copenhagen, Denmark); Casual Connect (London, UK); Nordic Game Conference (Malmö, Sweden); Digital Dragons (Kraków, Poland); Devcom (Cologne, Germany); Sweden Game Conference (Skövde, Sweden); Pocket Gamer Connects (Helsinki, Finland); Paris Games Week (Paris, France) Game Industry Conference (Poznan, Poland); GameON (Riga, Latvia); Devcom Leadership Summit (Lisbon, Portugal) (Jensen, 2019, p. 17).

3.2 The local landscape in the Baltic Region

The current study is focused to analyze the challenges that independent videogame developers face in four European countries: Latvia, Estonia, Norway and Finland, therefore is important to give a general look at the macroeconomic factors of each of these countries to provide context to the reader. For the preparation of this paper, it has not been possible to access documents or sources written in Estonian, Norwegian, Latvian or Finnish languages due to the dialectal barrier it represents to the author, therefore some relevant information could have been inadvertently excluded and limited to the resources that could been accessed either in English or with the use of automatic translation systems.

There is an intrinsic connection between the financial development of a Country, job creation and entrepreneurial endeavors (Isenberg, 2010, p. 2). According to Ács et al.(2019, p. 1) an entrepreneur is an individual that is focused on innovating through a business endeavor and the interactions such entrepreneurs establish within the countries’ ecosystem are significatively linked to the economic development. These complex structures that impact on the regulation of these interactions between start-ups, entrepreneurs and stakeholders can be defined as entrepreneurship ecosystem (Wadichar et. al., 2022, p. 1).

The entrepreneurial ecosystem concept, more prominent in the last 10 years, focuses on the different interdependent actors that form part of the community (Stam, 2015, p. 2). Entrepreneurs have specific needs to establish and grow their businesses such as qualified employees, access to technology, adequate infrastructure, access to financial services and regulatory frameworks, elements that form part of the Entrepreneurial ecosystem (Ács et. al., 2019, p. 9).

Innovation becomes fundamental to support the competitiveness of a region and creating new products, services and production methods while helping to improve the living standards and economic development (European Commission, 2024, p. 2). The innovation Performance is quantified as the Summary Innovation Index, that represents the normalized average for the 32 indicators. Based on these results, countries are categorized into four groups: Innovation Leaders, Strong Innovators, Moderate Innovators and Emerging Innovators. Finland is therefore classified as an Innovator Leader while Estonia improved its position and is classified as Strong Innovator due to changes in the dimensions Human Resources, Attractive Research Systems, Digitalization and Use of Information Technologies. Latvia is classified as an Emerging Innovator while Norway, although being outside of EU, it is included in the classification considering its geographical location and is also classified as a Strong Innovator. (European Commission, 2024, p. 44). When contrasting the strength of the national game ecosystems versus the Innovation Scoreboard, it is fair to affirm that there is a strong tie between the innovation capacity and the potential success of the local game industry (Hiltunen et al., 2024, p. 15).

The European Innovation Scoreboard (EIS), serves as a tool to evaluate the state of the Research and Development performance of the State members of the EU based on 32 indicators divided in four categories and 12 dimensions (European Commission, 2024, p. 14). These categories and dimensions are: Framework Conditions: human resources, Attractive research systems, digitalization; Investments: Finance and Support, firm investments, use of information technologies; Innovation activities: Innovators, linkages, intellectual assets; Impacts: Employment impacts, Sales impact, environmental sustainability.

The other two classifications that will be included in this work are the Global Entrepreneurship Index (GEI) and the Global Competitiveness Index (GCI). The GEI considers the level of entrepreneurship in a country and the supporting ecosystem such as agents, institutions and systems that would ultimately help boost the financial success of the country (Ács et al., 2017, p. 2). The Global Competitiveness Index (GCI) 4.0 was introduced by the World Economic Forum in 2018 as a tool to help countries and policy makers to compare their progress against 12 different pillars that determine productivity and develop economic strategies to improve their performance (Schwab, 2019).

In Table 3 several financial indicators for each country are presented, such as the total population per country and Gross Domestic Product (GDP). In terms of population and GDP, Latvia and Estonia are countries with strong similarities, while Norway and Finland share a similar population size although the GDP of Norway is twice as high as Finland's, boosted by the Country's oil and gas production (Norwegian Ministry of Foreign Affairs, n.d.). In the cases of both GEI and GCI, a higher value on the rank means that the corresponding country is better aligned with the benchmark established. The Country with the highest GEI Score is Finland, followed by Norway while Estonia and Latvia remain in third and fourth positions. In a similar way, Finland has the highest score in the GCI followed closely by Norway. In this case the gap between Latvia and Finland is smaller, yet when analyzing the results of the European Innovation Scoreboard, the difference between Latvia and Estonia is significative. These indicators will be revisited in further detail.

Country	**Population (2021)**[1]	**GDP Million Euros (2021)** [2]	**GDP Per Capita (2021)**[3]	**R&D expenditure (% of GDP) (2021)**[4]	**R&D expenditure Million Euros (2021)**[5]	**GEI (2019)**[6]	**GCI (2019)**[7]	**EIS (2024)**[8]
Latvia	1.884.490	33.348,90	17.696,51	0,74%	246,78	39,3	67	53,6
Estonia	1.330.932	31.169,00	23.418,93	1,75%	545,46	57,8	70,9	104,8
Norway	5.408.320	425.445,60	78.665,02	1,94%	8.253,64	56,1	78,1	117
Finland	5.541.017	250.664,00	45.237,90	2,99%	7.494,85	70,2	80,2	127,8

GEI: Global Entrepreneurship Index; **GCI:** Global Competitiveness Index; **EIS:** European Innovation Scoreboard
Data Sources 1: European Commision (2024); 2: European Commision (2024a); 3: Self Calculation; 4: WorldBank (2024); 5: Self Calculation; 6: Ács et al. (2019); 7: Schwab et al. (2019); 8: European Commision (2024b)

Table 3. Macro-Economic Factors, R&D Expenditure and GEI, GCI and EIS Comparison among Latvia, Estonia, Finland and Norway. (Self-Elaboration).

When analyzing the amount that each country spent on Research and Development, in 2021 Latvia allocated an estimated of 246 million Euros while Finland invested 7.5 billion euros and Norway 8.3 billion euros. Figure 6 represents the significant disparity in investment per country in Research and Development in 2021, according to the data obtained from the World Bank (2024).

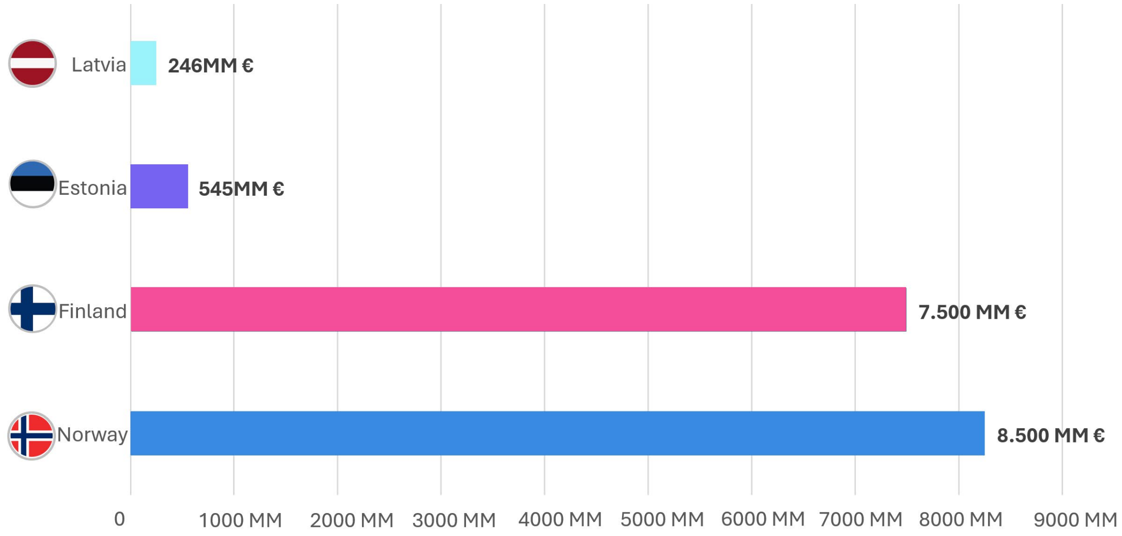

Figure 6. Research and Development Expenditure per Country by 2021 in Million Euros. (Self-Elaboration based on data from World Bank, 2024).

When looking into the Global Competitiveness Index, the 12 pillars considered to benchmark the performance of each country are Institutions, Infrastructure, ICT Adoption, Macroeconomic stability, Health, Skills, Product Market, Labour Market, Financial System, Market Size, Business Dynamism and Innovation capability (Schwab, 2019, p. 9). As illustrated in Figure 7, The radar chart compares the overall scores of Latvia, Estonia, Finland, and Norway across the 12 pillars with Finland (in pink) and Norway (in dark blue) generally perform the best across most categories, scoring highly in *Innovation Capability*, *Institutions*, and *Health*. Estonia, represented in purple, performs strongly in *ICT Adoption* and *Business Dynamism*, while Latvia (in light blue) scores lower across most indicators, particularly in *Market Size* and *Skills*, yet remains competitive in *ICT Adoption* and *Macroeconomic Stability*.

Finland is considered the best performing country in the world in respect of the First Pillar *Institutions* which considers factors such as Security, Judicial independence, Property rights and Intellectual property protection. Norway is considered a leading country in relation to the Freedom of the Press which is a component of the same pillar. Estonia, in the other hand is considered the best performing country of the world in relation to the Flexibility of Wage determination, which is a component of the 8th pillar *Labour Market.*

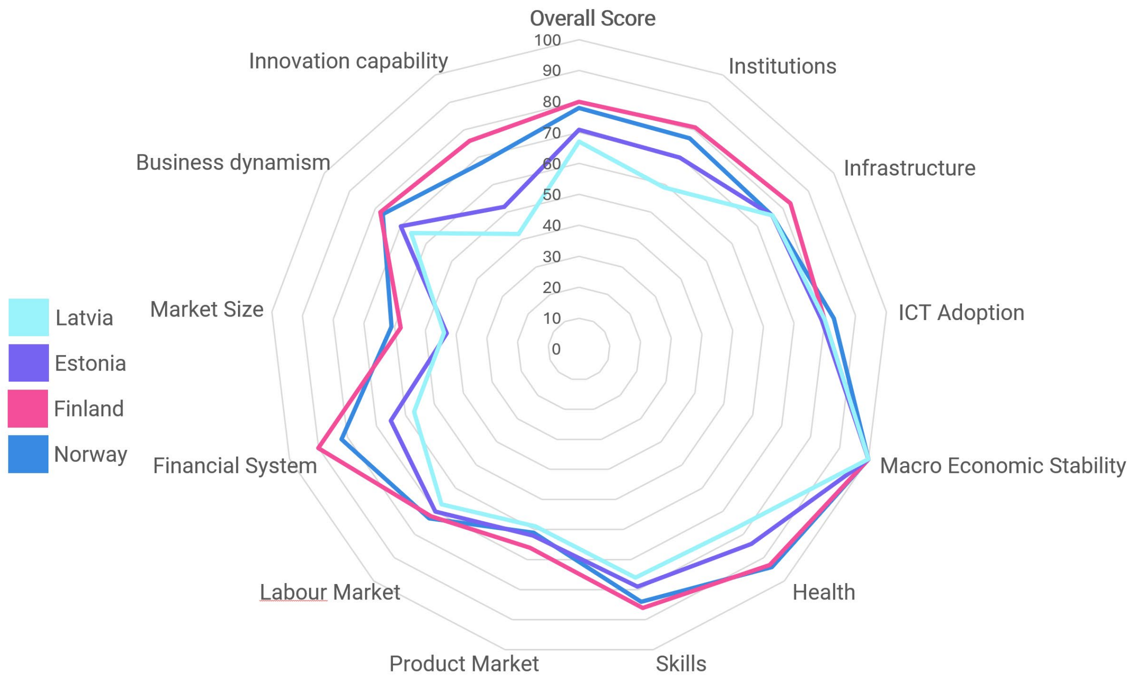

Figure 7. Global Competitiveness Index Score per Country by 2019. (Self-Elaboration based on data from Schwab, 2019).

On a similar way, the Global Entrepreneurship Index (GEI) considers several dimensions to assess the quality of the entrepreneurship in each country as well as the supporting entrepreneurial ecosystem (Ács et. al., 2019, p.15). The main building blocks are 3 components: *Entrepreneurial Attitudes*, which considers how the general population perceives entrepreneurship; *Entrepreneurial Abilities*, that refers to educated entrepreneurs in medium or high-tech sectors and *Entrepreneurial Aspirations* that considers the efforts of entrepreneurs to develop new products or services, expand to other markets and grow their business. These can be dissected into 14 pillars: Opportunity Perception, Startup Skills, Risk Acceptance, Networking, Cultural Support, Opportunity Startup, Technology Absorption, Human Capital, Competition, Product Innovation, Process Innovation, High Growth, Internationalization and Risk Capital.

Figure 8 shown below represents and compares the ranking among the four countries. Latvia, represented in light blue shows relatively balanced scores across most metrics, with notable strengths in *High Growth* and *Internationalization* although when compared to Norway or Finland Latvia reports the lowest scores in *Risk Acceptance* and *Process Innovation.* Risk Acceptance is considered one of the personal entrepreneurial attitudes and reflects the fear of failure as an obstacle to initiating a business (Ács et. al., 2019, p.15). Regarding the *Process Innovation* pillar, the GEI considers R&D as the percentage of GDP invested in Research and Development, the quality of Scientific Institutions and Availability of Scientist in the country (Ács et. al., 2019, p.17). This correlates to the data presented in Figure 6 referent to the expenditure on R&D. Estonia has a strong performance in *Risk Capital* and *Startup Skills*, indicating a supportive environment for startups while the *Technology Absorption* and *Risk Capital* are the lowest scoring pillars. Finland exhibits high scores in Cultural Support and Networking, suggesting a robust ecosystem for collaboration and support while Norway presents a varied profile, showing strengths in Human Capital and Technology Absorption, indicating a focus on skilled workforce and innovation.

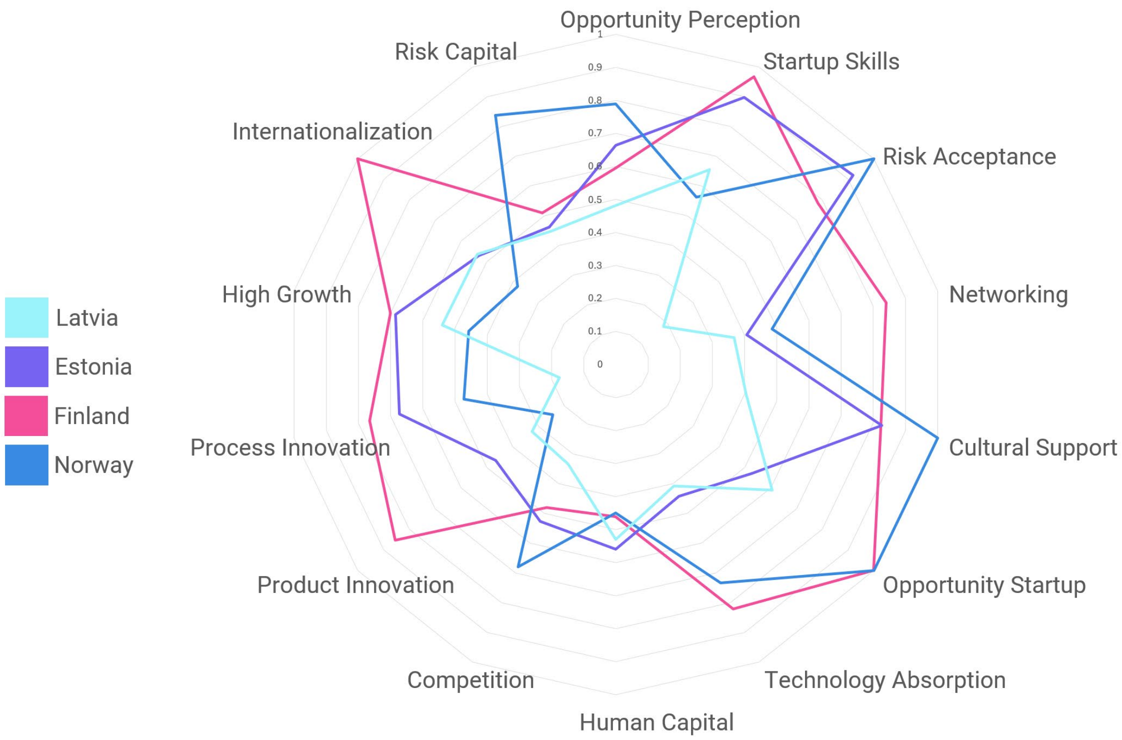

Figure 8. Global Entrepreneurship Index per Country by 2019. (Self-Elaboration based on Ács et. al., 2019, p.15-17).

Hiltunen et al. (2024, p. 15) classified the state of the national game development ecosystems across Europe in 4 general groups from the Low Capacity Developing Country to Leading Game Development Country considering factors such as the amount of developer studios, the size of the working force and the industry Turnover. Group A corresponds to the countries classified as “low-capacity development countries” that can be further divided into three segments: newcomers, emerging and well-established. In the countries classified as “newcomers” the game development studios are scarce while the support network and industry associations if existent, are marginal; the professional game education is considered as non-existent. The “emerging countries" lack robust support structures, the local industry associations are too young or immature and the professional game education is minimal. The "well-established countries" in the other hand have robust professional game education, the local industry operates within clearly defined and supporting structures and in general have a potential to improve their position within the next 5 to 10 years.

Group B agglomerates the countries described as "Moderate Capacity countries" which have sufficient established studios and employees although the combined industry turnover remains below 1 billion euros. Within this group, two sub classifications, "subcontracting" and "rising stars" can be found. Group C considers the "Strong Capacity Game Development Countries" with enough studios and employee capacity a well-established professional game education and specialized VC firms; while group D takes into consideration the "leading game development countries" with a robust ecosystem of studios, employees, professional education and specialized support tools and frameworks (Hiltunen et al., 2024, p. 17).

On the Figure 9, the four groups and its characteristics related to number of studios, size of the market and number of employees are presented.

According to the classification presented in the work by Hiltunen et al. (2024, p. 15), Finland is Classified as a Strong Capacity Game Development country while Norway can be defined as a Well-Established Game Development Country having the capacity to transform into a Moderate-Capacity game development country within the next 10 years. Both Estonia and Latvia are classified as emerging Game Development countries that still lack a well-established support structure and limited professional education related to the industry.

Low-capacity countries such as Norway, Latvia and Estonia face demand such as the creation and strengthening of local trade associations, access to local funding and establishment, improvement of the existent game education and access to senior and specialized work force (Hiltunen et al., 2024, p. 16). In a similar way, a Strong Capacity Game Development country such as Finland as a face should focus on facilitating the acquisition of specialized work force and continuing providing support to the existent support structures.

Utilizing as a baseline the report by European Game Developers Federation (EGDF) regarding the state of the European videogames industry (European Game Developers Federation, 2022), some key insights regarding the situation of the Videogame industry can be analyzed further. All the data corresponds to 2022 except in the case of Estonia where the most recent information dates to 2020.

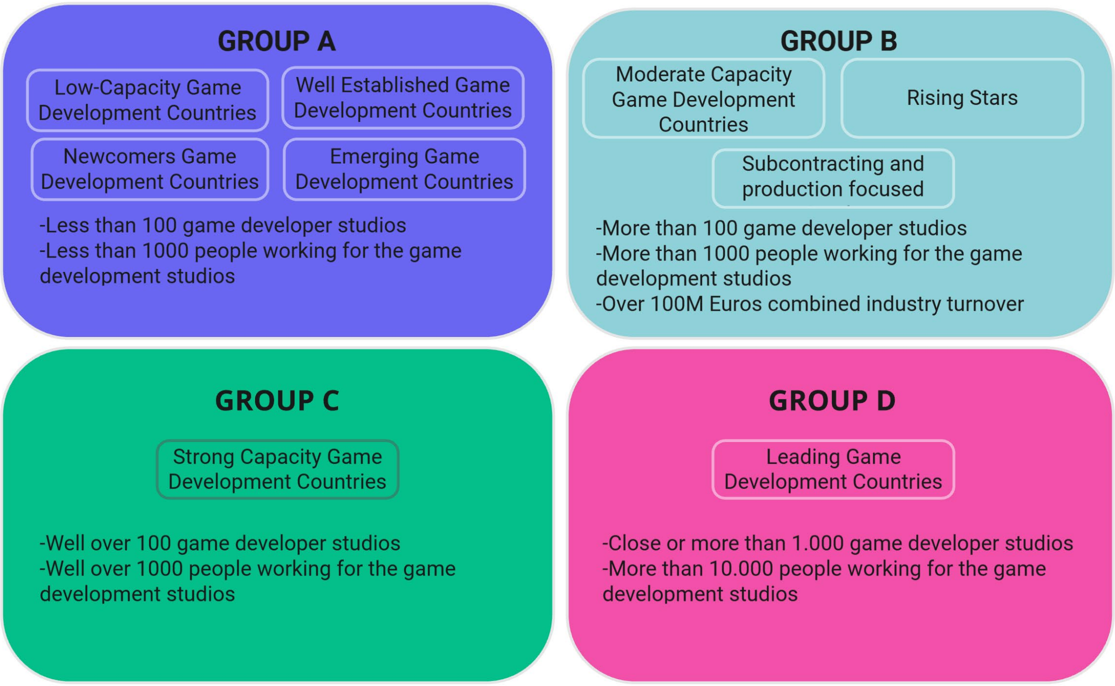

Figure 9. National Game Development Ecosystems in Europe. (Adapted from Hiltunen et al., 2024, p. 15).

The first point to examine is the number of Active Game Developer Studios functioning in each country. This includes game developers acting as self-employed working on their own projects or as subcontractors for other studios; third party publishers; active companies and local subsidiaries or representatives of a foreign organization which is registered locally. This list does not consider retail game distribution companies, adjacent service providers without artistic contributions to the game (business, legal, Human Resources, QA, analytics, porting, creating assets or music). Considering this, Norway presents the lower number of active studios with 24 registered organizations. A slightly higher number is found in Estonia, with 37 companies by 2020 according to EGDF report. Other documents analyzed (Estonian Institute of Economic Research, 2022, p. 60) reports over 50 companies operating in the industry, although it also includes companies that offer various services not specified, which might be the reason of the disparity between both. The report elaborated by GameDev Estonia (2021) that will be used in ulterior sections to dig deeper into the regional market, also presents a different amount, although in this case the difference is smaller, indicating that the number of organizations in the country are 41. Latvia has a higher number of registered companies at 65, while there are 232 game developers estimated in Finland.

For the data collection used on the EGDF report, the definitions that were considered to quantify the number of employees working in the country were related to include those that are working as full-time employees, entrepreneurs, in-house freelancers, remote working employees working from a third country yet excluding people working for subsidiaries and subcontractors in a third country. Taking that into account, the number of workers in Latvia and Estonia are quite similar with 293 and 304 respectively. Norway has an amount of 824 workers while Finland registers 3700 employees working in the videogame industry. In average in Europe, 24.4% of workers in the videogame industry are female. From the analyzed countries, Latvia has the lowest percentage with 16% of its workforce being female; Finland also has a portion below the European average with 22% while in Norway 29.2% of workers are female. There was no data available regarding the situation in Estonia.

When analyzing the size of the market in each of the countries it can be noticed that Latvia represents the smallest of the four in combined turnover with 22 million euros by 2022, although other sources reflect that there has been a noticeable increase of the turnover and profit in the local market, sustained mostly by mobile games (BGZ Berliner Gesellschaft für internationale Zusammenarbeit mbH, 2020a, p. 29). The turnover of the videogame industry in Estonia registered 36 million euros by 2020. Some researchers such as Ozimek (2021, p. 13) mention that within Estonia the subcontracted work is one of the prevalent relationships in the industry, with small developers and individuals providing services to other industries as well as companies established in other countries. The combined turnover in Norway is estimated in 55 million euros by 2022 while the Finnish market raised over 3,200 million euros by the same period. The report by EGDA also brings attention to the number of companies that released a title within 2022. This is a relevant metric because in many cases, some studios won't be able to publish their projects and, in some cases, shut down operations altogether (Josef et al., 2022, p. 65). The data considered by EGDA report considers only global launches, excluding alpha or early access versions. In 2022, 20 Latvian companies released new games; 15 companies in Norway contrasting with Finland, where 45 companies released a game during the year. Considering the total amount of companies in the country, it could be inferred that in Norway 62.5% of the companies released a game in 2022, while in Finland 19.4% of companies launched a game in the same year.

Taking into consideration the relevance of professional education in the field and the access to experienced talent, the report also references the number of formal institutions established in each of the studied countries that offer programs aimed to strengthen the skills in the field of videogame development. In the case of Latvia and Estonia, by 2022 only 2 and 3 formal institutions offered programs respectively. In Norway there are 6 different institutions that students can attend to professionalize and improve their careers while in Finland there are programs offered in 37 different institutions. This information is summarized in table 4 below.

Country	Number of Active Game Developer Studios by 2022. *For Estonia, the Data corresponds to 2020[1]	Number of people working in game developer studios and/or publishers by 2022[1]	Percentage of women working in the industry by 2022[1]	Combined Turnover of Game developer studios and publishers by 2022 (MM Euros)[1]	Number of Companies that published new titles in 2022[1]	Number of European formal Education institutions offering game development programs in 2022[1]
Latvia	65	293	16%	26	20	2
Estonia	37*	304	N/D	37,2	N/D	3
Norway	24	824	29,20%	55	15	6
Finland	232	3700	22%	3200	45	37

Source: 1 European Game Developers Federation (2022)

Table 4. Videogame Industry State in Latvia, Estonia, Norway and Finland. (Self-Elaboration based on data from European Game Developers Federation, 2022).

3.3 State of the Videogame Industry in Estonia

The information of the regarding of the situation of the Videogame Industry in Estonia has been collected from different sources, although the most recent and complete document used as a reference is the report titled “The Game Industry of Estonia” (Rusinovskis, 2021) published by GameDev Estonia (GameDev Estonia, n.d.). This organization created in 2021 represents developers, companies and educational groups involved in the videogame development. The report includes game studios and outsourcing companies officially registered in Estonia listed as active in 2021, while the financial information provided are related to the taxable turnover reported. In the document it is also indicated that the latest revision was made in April 2022, although due to the ever-changing panorama of the industry, since then, many companies have been closed while several other started their operations. Therefore, to update their status, the 41 companies originally listed were validated on the site Info Register (InfoRegister, 2024) which allowed to confirm which companies were still in operation, their current turnover and number of employees by 2024.

In Estonia the videogame development is considered as a sub-branch of the cultural industry (Estonian Institute of Economic Research, 2021, p. 4) whereas the videogame community can be grouped into three segments: companies with commercial focus, online gaming companies and hobbyists without commercial interests (Ozimek, 2021, p. 13). In general videogame developers register their economic activity under the section “Publishing of computer games (58211)” based on the Estonian Classification of Economic Activities (EMTAK), although in several cases, discrepancies in this aspect were found, some companies used codes such as “Programming (62011)”; “Production of cinema films (videos) (59111)”; “Software Publishing (58291)”; “Information technology and computer activities (62091)”; “Artistic creative activities (90031)” and “Business advice (70221)”. These discrepancies create additional difficulties when analyzing statistical and official data (Ozimek 2021, p. 10). Using the site InfoRegister.ee (InfoRegister, 2024) it was possible to update and expand the list of companies, by identifying the Top 15 Companies within the EMTAK code “Publishing of computer games (58211)” based on their turnover including companies that have been registered in the last 3 years and removing 2 studios that have been closed. 12 companies were incorporated. Of the 53 organizations, 3 companies are also in the process of liquidation. Table 5 contains the date of registration, turnover by 2024 as well as the number of workers listed by the second quarter of 2024 for the Top 15 Companies and compares the values reported in Rusinovskis (2021).

Considering the active companies, 40 of them (74%) are in Tallin, the capital of the country while 9 (16,7%) companies are established in Tartu. The total number of employees within the industry is 226 people, with 84 % of these organizations having less than 5 employees. Furthermore, 14 of these organizations do not list any employees on their registries while other 13 companies list a single individual. Figure 10 represents the distribution of companies based on their number of employees where only 4 companies have more than 20 employees and 13 companies are considered as solo ventures according to Rusinovskis (2021, p. 7). This reflects that the development market in Estonia is particularly focused on Independent Developers. It is also important to mention that the business register in Estonia incudes also several companies that are linked to e-residents and previous participants of the Game Founders program whose operations are located outside of Estonia (Estonian Institute of Economic Research, 2021, p. 5). The report by Rusinovskis (2021) also determined that most popular engines for videogame development in Estonia were Unity, used by 52,9% of the companies; Unreal (29,4%) and Game Maker used by 5,9%. The most popular platform was PC.

Taking into consideration only the 49 companies that are active, it is estimated that 27 (55,1%) of the companies were registered less than 5 years ago, while 22 (15%) companies were registered more than 10 years ago. By 2021, the total turnover of the industry was estimated at 50,4MM Euros, reflecting a growth of 20.69% compared to 2020. Figure 11 presents the number of videogame companies in Estonia based on their registration date according to the report by Rusinovskis (2021, p. 7).

Company	Revenue 2021 (Thousands Euros)[1]	Revenue 2024 (Thousands Euros)[2]	Number of Employees 2021 [1]	Number of Employees by Q2 2024[2]	Registration
B2BServices	New Company[3]	311.060	New Company[3]	None	September 2022
ZAUM Studio	20.697	7.849	2	8	October 2015
CM Games	20.261	6.515	54	32	March 2009
Spiral Up Game Publishing	New Company[3]	3.486	New Company[3]	None	October 2023
Original Games	Not Included[4]	1.117	Not Included[4]	None	December 2018
Etail Market	Not Included[4]	778	Not Included[4]	None	December 2020
Alkirilenko	Not Included[4]	590	Not Included[4]	1	October 2018
Paga Games	New Company[3]	554	New Company[3]	None	May 2023
Esports Entertainment	Not Included[4]	491	Not Included[4]	3	June 2021
Loquiz	Not Included[4]	461	Not Included[4]	4	November 2011
Spinupgaming	Not Included[4]	370	Not Included[4]	None	June 2021
ZBS Games	Not Included[4]	351	Not Included[4]	None	March 2021
Mixed Realms	Not Included[4]	301	Not Included[4]	None	December 2018
Joyixir	600	172	2	1	August 2020
HRA Interactive	New Company[3]	118	New Company[3]	None	June 2023

1. Source: Rusinovskis (2021). **2 Source:** InfoRegister.ee **3.** This company was registered after Rusinovskis (2021) report was published, therefore is considered a "New Company". **4.** This company was not originally included in Rusinovskis (2021) report

Table 5. Top 15 Estonian Game Development Companies based on the Revenue by 2024. (Self-Elaboration based on data from Rusinovskis (2021) and InfoRegister, 2024).

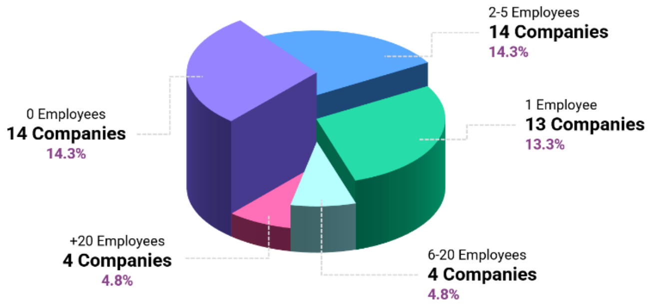

Figure 10. Number of Employees per Company in Estonia. (Self-Elaboration based on data from Rusinovskis, 2021, p. 7).

Sources (Ozimek, 2021, p. 13; Estonian Institute of Economic Research, 2021, p. 8) mention Play-tech Estonia as the largest employer in the field of "Entertainment Software" with 677 workers listed by 2024 focused on the field of gambling and online casinos. This company is registered under the EMTAK code "Programming (62011)" and was not included in the original listing by GameDev Estonia (Rusinovskis, 2021).

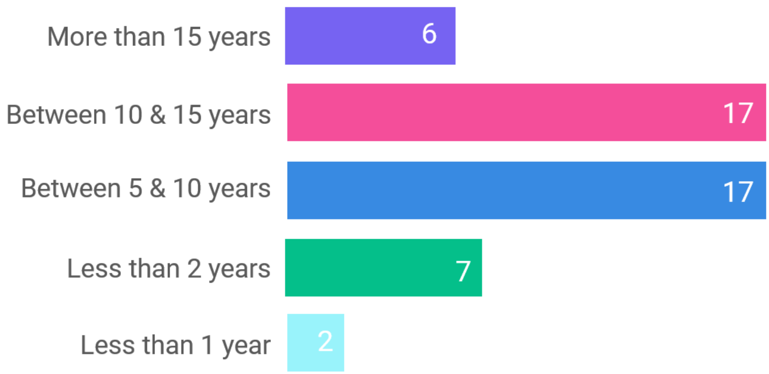

Figure 11. Distribution of Videogame Companies in Estonia based on their date of creation (Self-Elaboration based on data from Rusinovskis, 2021, p. 7).

In 2021, the entertainment software sector in Estonia generated sales revenue of 50.4 million euros, and by 2024 this increased to 344 million euros. This sharp increment is entirely due to the inclusion of B2Services, a company registered in 2022, which focuses on developing Social Casino games for iOS and Android using a free-to-play model (B2Spin, n.d.). Their "Sweepstakes" approach allows players to cash out bonuses as real currency (Knight, 2024) avoiding strict gambling regulations. However, the game's availability is restricted by local gambling laws, such as in the U.S. states of Alabama, Georgia, Washington, and Nevada (Levi, 2024), and in Finland (Ministry of the Interior, 2024). Although B2Services does not show registered employees in Estonia, it was reported in May 2024 that trading operations would be managed by B-Two Operations Limited (Sweepskings, 2024). If B2Services is excluded from the 2024 estimation, the projected turnover would drop to 33.4 million euros, which represents a 33.7% decrease from the previous year according to the data available on the report by GameDev Estonia (Rusinovskis, 2021).

Among the relevant videogame companies that operate in Estonia, Zaum Studio is worth mentioning. This is responsible for the development and publishing of *Disco Elysium* (Kurvitz, 2019) a fantasy RPG game that helped boost the Estonian industry both internally and internationally, although the reduced access to infrastructure and talent motivated the company to relocate to the UK. Nevertheless, its success helped the industry gain notoriety among policymakers and impulse positive changes in the local infrastructure and policies (Ozimek, 2021, p. 17).

CM Games is mostly focused on developing and publishing mobile games for both iOS and Android platforms (Estonian Institute of Economic Research, 2021, p. 8) although has also developed in other platforms such as VR, receiving a positive response with the release of the game *Into The*

Radius (CM Games, 2019) available for PC, MetaQuest and PlayStation 5 and employing 32 people (Info Register, 2024d).

Videogame developers in Estonia face several challenges, including access to qualified employees, high taxation scheme and a bureaucratic system that complicates the process when hiring foreign specialists, although it has improved compared to previous years (Estonian Institute of Economic Research, 2021, p. 6). It was also mentioned that the public grants are inadequate to promote cooperation among sectors or to facilitate the export capacity (Estonian Institute of Economic Research, 2021, p. 14). This is particularly relevant since it is considered that the revenue proceeds from foreign markets, considering the small size of the local population (Estonian Institute of Economic Research, 2021, p. 8).

Support for the development of entertainment software in Estonia is available through both public and private funding sources. By 2020, Enterprise Estonia (EAS) had provided a total of 316.000 euros to the entertainment software sector through various initiatives. Similarly, the Estonian branch of the International Game Developers Association (IGDA) received funding from the European Regional Development Fund on three occasions to strengthen support structures for the creative economy. Additionally, the Estonian gaming industry's development program has been financed with 574,000 euros (Estonian Institute of Economic Research, 2021, p. 13) yet EAS grants are considered too small to allow expansion and support more complex projects in comparison to Finland, where large-scale support is available for R&D (Estonian Institute of Economic Research, 2021, p. 14). The country has a considerable number of crypto investors although they are not focused on videogames (Hiltunen et al., 2024, p. 50).

Graduates of Estonian universities in computer science generally have a strong foundation in IT, enabling them to acquire specialized skills on the job (Estonian Institute of Economic Research, 2021, p. 17). Some universities and institutions offer programs to support careers in game development. Estonian Entrepreneurship University of Applied Sciences (EUAS) (Mainor) offers a Bachelor's Degree on Game Design and Development. Tallin University offers a Master's Degree in Digital Learning Games and the University of Tartu provides through the Computer Graphics and Virtual Reality Laboratory (CGVR Lab) different courses focused on Game Design, Game Development, Programming and Game Engines (CGVR, 2024). Private companies also have invested in training of future Videogame Developers. For example, the videogame company Gamecan has partnered with Tartu University Pärnu College since 2021 to support education in the field and developed the Full Cycle Academy (Hiltunen et al., 2024) offering courses in several areas of Videogame development (3D Art, VFX for games, Game Programming and Game Design) utilizing

Unreal Engine as the main tool. A study by Tunnel and Norbisrath (2022, p. 191) mapped the key skills demanded by videogame companies in Estonia, concluding that besides the technical skills and cross functional abilities, Time Management is listed as a relevant ability that demands the employee's independence and autonomy.

Estonia presents a fast track to start a business by allowing both an e-Residency and e-Business Register. The e-Business Register allows entrepreneurs to register a new company within a few hours through an online service, requiring only a minimum share capital of 1,000 euros. Additionally, the e-Residency program facilitates non-Estonians to register and make use of the service digitally with 99% of the Companies in the country being established through the online portal. (e-Estonia, n.d.). According to the government portal e-Residency (e-Resident, 2024) there are different initiatives that can offer resources and opportunities that can be utilized by entrepreneurs and e-Residents to boost their projects.

Several events focused on Videogame Development and Game Jams take place in Estonia: IDA Game Jam 2024 was organized as a joint cooperation between Ida-Viru Entrepreneurship Center and GameDev Estonia (Tehnopol, 2024), Global Game Jam Pärnu 2024 was held in January 2024 sponsored by Full Cycle Game Academy, Gamecan and GameDev Estonia (GlobalGameJam, 2024) while Tartu Ülikooli Mängujämm 2024 allowed participants to develop their skills while interactive with other creators in a collaborative environment (CGVR, 2024a). The University of Tartu also organized the Pro Game Jam 2024 which had two separate tracks for junior and professional developers. In the 2024 edition 70 developers participated in the event (CGVR, 2024b).

The Estonian Virtual and Augmented Reality Association (EEVR) is a non-profit organization focused to advance the development of Virtual, Augmented and Mixed Reality in Estonia by linking companies, public organizations and developers of entertainment applications and serious games (EEVR, 2024). In 2015, the Estonian branch of the International Game Developers Association was created to support the local gaming industry and entrepreneurship through events, training, and expert visits (Estonian Institute of Economic Research, 2021, p. 12).

3.4 State of the Videogame Industry in Latvia

In Latvia the videogame industry is considered part of the creative industry sector and operates under the authority of the Ministry of Culture within the category "Computer games and interactive software” (Ventspils Digital Centre, 2019, p. 6) and gambling industries are included under the same umbrella.

According to Hiltunen et al. (2024, p. 50) by 2021 there were registered 57 game development studios in Latvia. Around 295 employees were listed as employed by one of these companies and the combined turnover was 24M Euros. Nevertheless, through a 2018 survey by the Latvian Game Developers Association (LGDA) it was estimated that 450 game developers operated in the country. 80% of the respondents of the survey were based in Riga and 83% were male. In average, the companies had 5 employees which indicates that the industry is concentrated in small companies (Baltic Game Industry, n.d.).

Exploring the official registry of companies that operate in Latvia is a laborious task, mainly because the official Latvian Statistic Portal clusters information based on the Economic Activity without indicating the company’s name or Tax ID number. Most companies dedicated to developing videogames are listed under the Economic Activity 62.01 “Computer programming” although others are listed in the Economic Activity 58.2 “Duplication of computer software”.

To identify the most relevant videogame companies in Latvia, the portal GameDevMap.com (GameDevMap, 2024) was used as a baseline obtaining a preliminary listing of 11 companies. This was further expanded by using the information on the site Startin.lv (Startin, n.d.) including 7 companies listed in the sector Gaming and 8 additional companies listed under Gaming startups from the site Tracxn.com (Tracxn, 2024).

A resource that has been used in the preparation of this thesis is the data registered by the site Lursoft.lv (Lursoft, n.d.). This company offers detailed information about any registered Baltic company, including turnover, number of employees and details of their board of directors. The general access is free, although it requires authentication through an online ID provided by a Latvian bank. To gain access to the database, a sales representative was contacted and provided access after verifying through a zoom video call the identity document of the researcher. Certain reports and data such as turnover of the companies require a payment therefore the information was complemented with the information found on the portal Okredo.com (Okredo, n.d.). It was also possible to identify the 8 additional companies that were registered under the NACE code 58.21 referred to “Publishing of Computer Games” on the site Lursoft.lv (Lursoft, n.d.-a.), which were included in the preliminary list. Following this process, 34 videogame companies were identified, and their data was checked in both Lursoft and Okredo portals validating if they were active and registered, number of employees and turnover. The final list considers 24 active companies and Table 6 presents the Top 10 companies considering their reported Turnover by 2023. The table also includes the Registry Date, number of employees, location of the main office and the Commercial Activity listed in the registry. The biggest company in terms of turnover is Estoty with over 4.6 million euros followed by Hypercell Games with an estimated turnover of 2.9 million euros. All the data to build this table was obtained through the site Okredo.com.

Estoty Games is a company registered in 2012 and is focused on developing freemium mobile games for both Android and iOS utilizing Unity as a game engine (Estoty, 2024). Some of the titles produced are *Idle Breaker* (Estoty, 2023), *Idle Civilizations* (Estoty, 2023), *Merchant Mike* (Estoty, 2022), *My Little Universe* (Estoty, 2022), *Squad Alpha* (Estoty, 2022), and *Johnny Trigger* (Estoty, 2021) among others. According to the public registries, Estoty had a turnover of over 3.4 million Euros by 2022 and has 13 employees working for the company (Okredo, 2024b).

Hypercell Games was registered in 2019 is focused on developing mobile games for Android and iOS such as *Rope and Balls* (Hypercell, 2022), *Freaky Stan* (Hypercell, 2022), *Sand Balls* (Hypercell, 2021) and *Garden Balls* (Hypercell, 2021) with millions of downloads on both platforms (Hypercell, n.d.-a). While implementing a freemium business model, the company relies on ad revenue and in 2022 filed a revenue of over 4,000,000 Euros and lists 11 employees (Okredo, 2024a). Hypercell has received public incentives to impulse their business: on 2022 the company signed an agreement to receive financial assistance under the project “Promotion of International Competitiveness” that was co-financed by the European Regional Development Fund and in the same year received support to attract qualified workers under the support objective “Increase Private Sector Investment in R&D” (Hypercell, n.d.-a).

Another relevant Latvian company is tinyBuild Games. This company, although registered in 2019, initiated activities in 2011 developing a Kickstarter backed game *No Time to Explain (*tinyBuild, 2011*)* and change to a Publisher for the game *SpeedRunner HD* (DoubleDutch Games, 2011) in 2013 focusing on marketing, distribution and visual elements to help the game standout (Tinybuild, n.d.). The game was released under Steam Early Access, selling more than 3 million units and perceiving an estimated revenue of 30.15 million euros (VG Insights, n.d.).

Among the games that tinyBuild Games has supported as publisher the following titles can be found: *Kill It With Fire* (Casey Donnellan Games LLC, 2020), *Kill It With Fire 2*(Casey Donnellan Games LLC, 2024), *Kill It With Fire VR* (Casey Donnellan Games LLC, 2023), *Not For Broadcast* (NotGames, 2022), *Potion Craft* (Niceplay Games, 2022) and the saga *Hello Neighbor* (Dynamic Pixels, 2017), *Hello Neighbor 2* (Dynamic Pixels, 2022) and *Hello Neighbor: Hide and Seek*

(Dynamic Pixels, 2019) in platforms as PC, Xbox One and Series X/S, Playstation 4 and 5, Nintendo Switch and mobile. Considering the success of the game *Hello Neighbor*, tinyBuild Games acquired the original developer Dynamic Pixels and established a new company on the Netherlands called Eerie Guest Studios as part of a 13.5 million euros investment on the franchise that has been downloaded millions of times and even its merchandising has generated millions in revenue (Batchelor, 2020).

Name	Registry Date[1]	Number of Employees[1]	Location[1]	Turnover Euros[1]	Activity[1]
Estoty	July 2012	29	Riga	4.609.091	Publishing of computer games
Hypercell Games	July 2019	11	Riga	2.973.329	Retail sale of computers, peripheral units and software
Beetroot Lab*	June 2017	30	Valmieras	1.520.793	Computer programming activities
tinyBuild Games**	September 2019	11	Riga	1.244.513	Computer programming activities
BFA	October 2003	7	Jurmala	369.179	Other amusement and recreational activities n.e.c.
Roadgames	September 2019	1	Riga	236.375	Computer programming activities
ColdWild Games / AbsoDev	January 2016	7	Riga	171.467	Data processing, hosting and related activities
Prime Peaks	February 2019	3	Sigulda	114.928	Computer programming activities
Ambergames	February 2008	4	Riga	101.684	Computer programming activities
Rocknight Studios	November 2014	4	Marupe	63.809	Manufacture of games and toys

Source: 1 Okredo.com. * Financial Information corresponds to year 2021. ** Financial Information corresponds to year 2022

Table 6. Top 10 Game Development Companies in Latvia based in Turnover by 2023. (Self Elaboration based on data from okredo.com, 2021 & 2022).

According to the report by Rusinovskis (2021, p. 15), by 2022 57% of companies in Latvia are developing games for PC or Mac platforms; 18% of companies are creating games for mobile or tablet platforms and 14% of companies are developing games for browsers. Console and VR/AR development are much less common with 7% and 4% respectively. This information is presented on Figure 12.

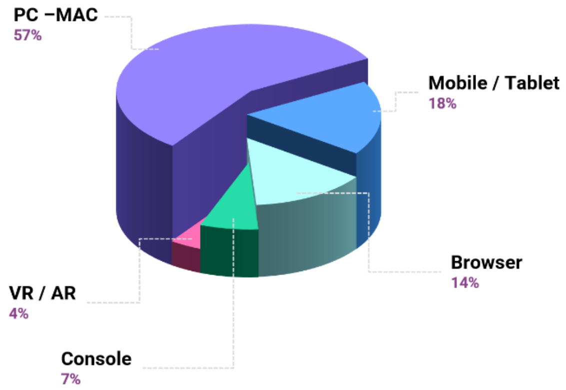

Figure 12. Percentage of Games Developed per Platform in Latvia by 2022. (Self-Elaboration based on data from Rusinovskis, 2021, p. 15).

LGDA was formally established in 2014 and is focused on supporting the Gaming Industry in the country by promoting cooperation between game developers and educational activities. The organization arranges recurrent events such as the monthly GameDev Meetup, a yearly game competition called BRSD and serves as participating in international events in the region. (GameCompanies.com, n.d.). Throughout the different sources investigated, the Latvian Game Developers Association is mentioned either with the acronym in English (LGDA) or Latvian (LSIA). For consistency, it will be referred as LGDA although the source material might be using the Latvian acronym. Alongside the Faculty of Computing at the University of Latvia, LGDA organizes the Latvian Games of the Year Award which features an international jury and present awards in eight categories, including Console Game of the Year, Jam Game of the Year and Art Design of the Year (Gamedev, 2023).

After the participation on the Baltic Game Industry project (BGI), Ventspils Municipality led the local policies and practices to establish a nurturing industry by adapting industry practices to the Latvian region (Ventspils Digital Centre, 2020, p. 30). Several challenges mapped included lack of financial support and a reduced pool talent and non-existent communication between the diverse parties that compose the local ecosystem. The model shown in Figure 13 taken from Ventspils Digital Centre (2019, p. 11) showcases the complex Ecosystem of Videogame Development in Latvia, highlighting the different actors and stakeholder that participate in it and influence each other through lobby activities, regulation, funding and incentives for startups. These elements impact the market, and the funds are recycled into the system through Revenues and Taxes demonstrating the collaborative relationship between the industry/public sector, political/governmental bodies, and educational institutions in fostering the growth and success of Latvia's gaming industry. Each sector plays a crucial role in supporting game developers and companies through resources, policy advocacy, education, and funding initiatives. These elements contribute to the broader gaming market by enhancing competence, skills, and revenues within the sector. Three sections are identified as Industry / Public; Politics and Education.

Through Ventspils Digital Centre several projects have been developed, aimed to increase the competences in the videogame development. Some of these initiates are: “Sesame – We're learning Game Design” oriented schools and educators to analyze the implementation of game design in schools both in art and computer science subjects; “Baltic Game Industry - Empowering a Booster for Regional Development” which finalized in 2020 had as a main objective improve the situation of the videogame industry in the Baltics expanding the use of game applications beyond entertainment and reaching other sectors such as construction, healthcare or logistics (Ventspils Digitālais Centrs, n.d.).

Education constitutes the main pillar for the videogame industry (Ventspils Digital Centre, 2019, p. 11). Both gaming companies and citizens should demand local and national government to create and strengthen the educational programs and leverage their voices using social media generating a demand in the market. As the universities implement new study programs, more professionals are formed, and which will feed the start-up incubators and new companies as well as existing ones will be provided with the talent needed to impulse the sector and compete internationally. Several initiatives help promote the education towards game development. The Ventspils Digital Center offers remote courses for students from 5th to 12th grade focused on 3D modelling, game environment, animation, game programming, digital sculpture and artificial intelligence (Ventspils Digitālais Centrs, 2023). The EKA University of Applied Sciences offers a Bachelor’s Degree in Computer Game Design and Graphics (Ekonomikas un Kultūras augstskola, n.d.) and online lectures under the framework “Accelerating ICT students” with the topics of Introduction to Game Design and Gamification (Ekonomikas un Kultūras augstskola, n.d.-a). The Vidzemes University of Applied Sciences offers a Master Degree in Virtual Reality and Smart Technologies with practical application. This program was developed alongside companies in the fields of VR and AR (Vidzemes Augustskola, 2024).

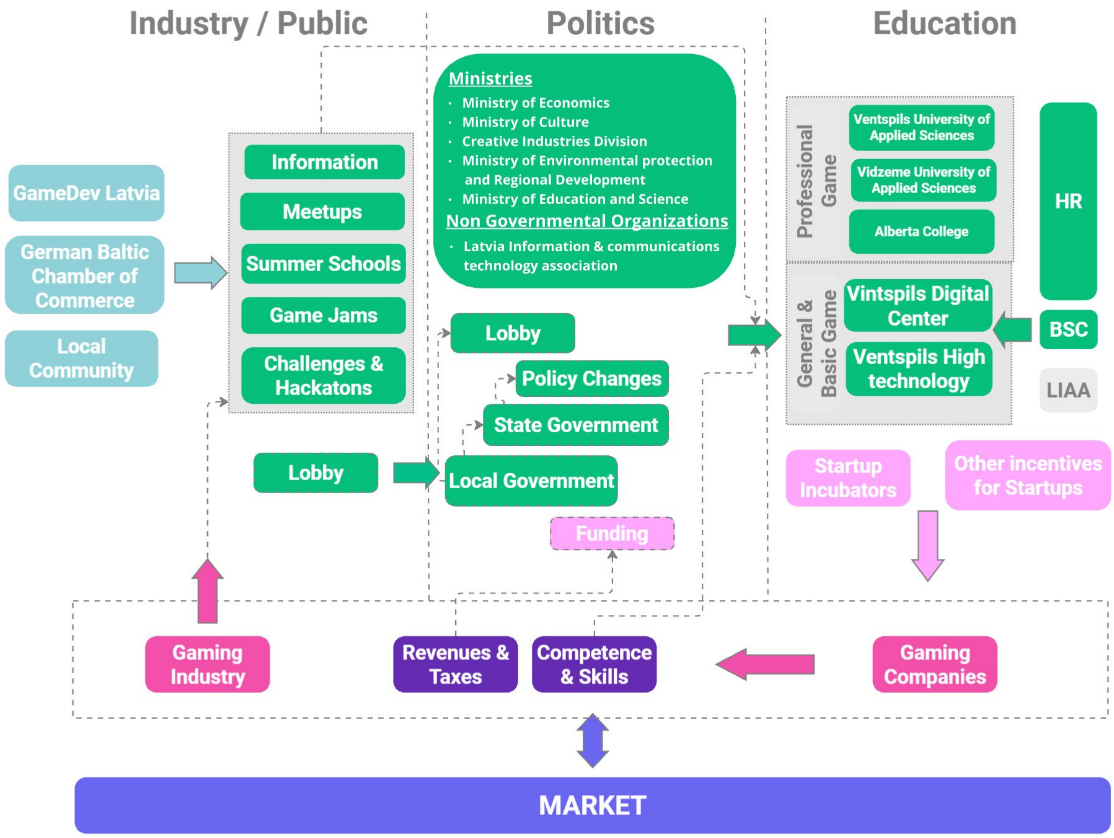

Figure 13. Videogame Ecosystem in Latvia. (Adapted from Source Ventspils Digital Centre, 2019, p. 11).

Multiple initiatives are focused to boost the local ecosystem of entrepreneurs in Latvia. One of the most notable is TechChill, the largest technology-focused event in the Baltic region. It brings together entrepreneurs as well as local and international investors (Techchill, 2024). The event offers cash prizes to winner, along with advertisement credits and free tuition for select participants (LSM, 2024). Another key initiative is TechHub Riga, which, with the support of The Latvian Ministry of Economics and Riga Investment and Tourism Agency arranges organizes events throughout the year to support the startup ecosystem. These include meetups, hackathons aimed to high school and university students, workshops and incubator programs such as “Prototype it”, “Demo Day” and “Startup School of Schools” (TechHub Riga, n.d.). Additionally, Latvia hosts several technical incubators that support game startups, helping to further develop the startup scene in the country (Ventspils Digital Centre, 2020, p. 30).

3.5 State of the Videogame Industry in Norway

The production of videogames in Norway initially started with a hobbyist approach in the 1980s yet not considered a stable business until mid-1990s (Sotamaa et al., 2020, p. 8). By 2021, 17 studios were operating in Norway with 433 employees and a combined turnover of 51M (Hiltunen et al., 2024, p. 49). The results of the survey prepared by the Norwegian Film Institute (Norwegian Film Institute, 2023, p. 11) among 32 gaming companies shows a growth of 47% in respect of the gross revenue and 70% in the number of workers in the industry.

In 2022, 10 companies released a total of 15 games and 36% did it through a publisher, while 64% operated as self-publishers (Norwegian Film Institute, 2023, p. 14). Eight of these ten companies financed their games with support of public and private funds established in Norway and only one of them received also international financing. The other 2 companies responded to have found international support to fully finance their games. The platform where these games were released can be detailed in Figure 14, with PC being the most used platform followed by Nintendo. In a third place the consoles PlayStation and Xbox and the mobile platform Google Store. Apple is ranking slightly behind, while only 1 game is developed in VR platform (Norwegian Film Institute 2023, p. 14).

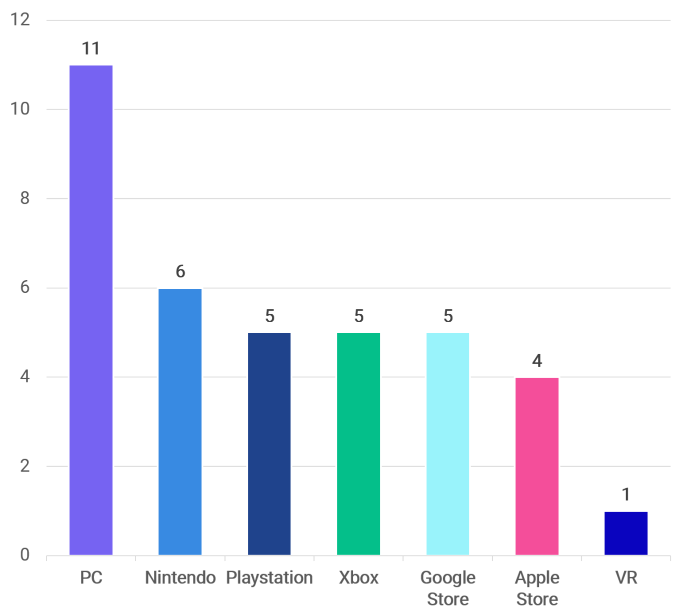

Figure 14. Number of Games Developed per Platform in Norway by 2023. (Self-Elaboration based on data from Norwegian Film Institute 2023, p. 14).

Table 7 presents the status of the Videogame Industry and its evolution from 2017 until 2022, including the Development Budget, the investment in development for games that are already in operations, number of permanent and temporary employees and the proportion of women in the industry, which started being informed by 2020. The original data from Norwegian Film Institute (2023, p. 11) is presented in Norwegian Crowns and the exchange rate used to represent this data to euros is from September 5th 2024. It is worth noticing significative improvements across all the metrics, including the Development Budget, Average Development Budget as well as the number of permanent and temporary employees.

	2017	2018	2019	2020	2021	2022
Development Budget	5.046.195 €	1.602.909 €	6.928.977 €	5.945.181 €	16.402.254 €	33.771.342 €
Average development budget	313.797 €	101.772 €	457.974 €	424.050 €	1.094.049 €	1.407.846 €
Investment in development for games that are in operation/sales	10.007.580 €	14.239.599 €	4.961.385 €	5.266.701 €	4.511.892 €	22.924.143 €
Average investment in development for games in operation/sales	627.594 €	890.505 €	330.759 €	373.164 €	296.835 €	958.353 €
Number of permanent employees	227	259	324	347	433	738
Number of temporary employees	24	26	32	21	13	86
Proportion of women (permanent and temporary)	N/D	N/D	N/D	20%	22%	29,20%

Table 7. Norwegian Videogame Development Industry 2017 – 2022. (Adapted from Norwegian Film Institute, 2023, p. 11)

Norway is classified as a Low-Capacity game development country with well-established support structures and a professional education network (Hiltunen et al., 2024, p. 16). Among the key challenges that Norway faces are establishing and strengthening local structures, facilitating the access to local risk capital and investors, reinforce the specialized educational system and gain access to senior talent (Hiltunen et al., 2024, p. 16). A common challenge in the Videogame industry is the gender disparity. According to EGDF's report (European Game Developers Federation, 2022, p. 10) 29.2 % of the workforce in the Norwegian game industry is represented by women. To continue reducing this gap, the NFI organized in 2023 and 2024 the talent development program UP3 in cooperation to offer support to female game developers in the form of personal grants, individual coaching and travel support to attend international industry events such as Nordic Game and Game Developers Conference GDC (Norwegian Film Institute, n.d.). Additionally, the non-profit organization Women in Games Norway arranges networking events with the mission to support the education and empower individuals that are involved in the game industry as workers, students or researchers (Women in Games Norway, n.d.).

The Leading videogame companies in Norway by 2022 based on their revenue are presented in Figure 15. The company Funcom established in Oslo in 1993 is focused on developing PC and console games, starting as an outsourcing company developing games for thirds parties. With the release of *Anarchy Online* (Funcom, 2001) in 2001, the company became one of the pioneers in the genre massively multiplayer online role-playing games (MMORPG) (Funcom, n.d.). In 2005, Funcom changed its structure to become a publicly traded company listed on the Oslo Stock Exchange and in 2020 Tencent Holdings Limited acquired 95% of its shares (Cision, 2019). More recent releases include *Secret World Legends* (Funcom, 2017), *Conan Exiles* (Funcom, 2018), and the awaited *Dune: Awakening* (Funcom, TBR) which will be released for PS5, Windows and Xbox Series X/S (McNally, 2024).

Dirtybit is a game studio founded in 2011 located in the city of Bergen. The company started as a mobile game company by a team of students at the Norwegian University of Science and Technology (NTNU). After the success of the multiplayer race game *FunRun* (Dirtybit, 2012) the company continued iterating the same IP with the releases of *FunRun2* (Dirtybit, 2014), *FunRun3* (Dirtybit, 2016), *FunRun4* (Dirtybit, 2023) among other titles such as *Dino Dash* (Dirtybit, 2014) *Shiprekt* (Dirtybit, 2015), *Fun Royale* (Dirtybit, 2019) and the puzzle game *Drop the Box* (Dirtybit, 2012). The business model in these titles is the freemium approach, for either Android and iOS platforms. *Fishing: Barents Sea* (Misc Games, 2018) is a PC game that simulates the operation of a commercial fishing boat. Developed in Unreal Engine 4 it managed to obtain an estimated gross revenue of 1.98 million euros (VG Insights, n.d.-a).

After the positive reception, the developer released additional content in the form of DLCs. The most recent release of the developer is another boating game titled *Ships at Sea (*Misc Games, 2024*)* that this time allows the player to operate diverse types of services such as cargo besides the commercial fishing. This game has been developed using Unreal Engine 5. The company, established in 2013, has received support from the Norwegian Film Institute; Filmkraft Rogaland, the Research Council of Norway and Mediefondet Zefyr.

Hiltunen et al. (2024) defines the key challenges that Norway's videogame industry faces as need to attract investors, improve the industry-oriented policies and expand the existent specialized education offer. When it comes to the funding, 80% of the companies that released a game in 2022 mentioned that have covered their development costs with a combination of public and private funds, with the 20% relying exclusively on international funds (Norwegian Film Institute, 2023, p. 17). The NFI is considered the main instrument in Norway focused to support the game-industry (Hiltunen et. al., 2024, p. 49) and it is manifest how the facilitation of public funds expedites and promotes access to private capital: the investment of previous years has proven fruitful with the release of larger games and the introduction of new companies to the ecosystem. Both small and bigger developers are equally important and support the growth of the industry (Norwegian Film Institute, 2023, p. 21)

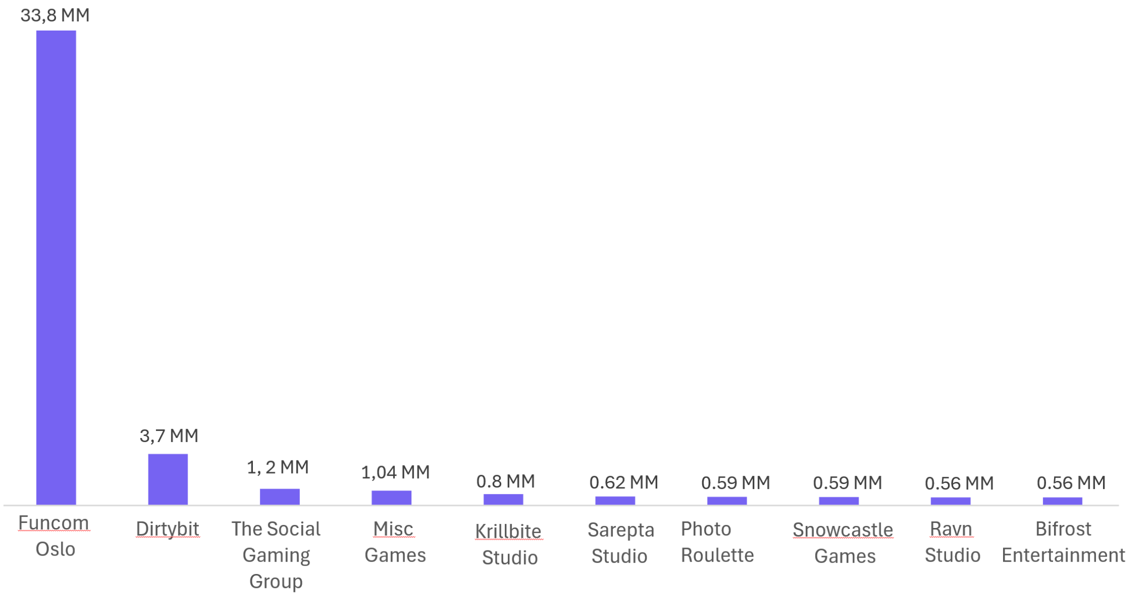

Figure 15. Top 10 Videogame Companies in Norway by Revenue in 2022. (Adapted from Clement, 2024a).

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(European Commission, n.d.) also offers yearly support to developers (Norwegian Film Institute, 2023, p. 18).

Several initiatives support game development and entrepreneurship in Norway. Regional film centers provide guidance, skill training, travel grants, and early-stage development funds, which are especially useful before applying for Norwegian Film Institute (NFI) grants (Norwegian Film Institute, 2023, p. 35). Each center has its own criteria; some allow applications from individuals, while others require company applications or are tailored for young developers (Filmkraft, n.d.; Tvibit, n.d.). For instance, Viken Film Center organizes the annual Game Convention for the Norwegian industry and the Game Jam UNG (Viken Filmsenter, n.d.; Filmkraft, n.d.; Mediev, n.d.). Østnorsk offers grants of up to 16,000 euros for early-stage, culturally rooted game development projects, and up to 50,000 euros for commercial projects (Østnorsk, n.d.). Østnorsk also collaborates with Hamar Game Collective and the VR cluster VRINN to support the establishment of motion capture and virtual production studios (Norwegian Film Institute, 2023, p. 37).

To simplify access to various funding sources, the platform Spillfinansering (Spillfinansering, n.d.) was created by Noneda, allowing companies to search for funding opportunities. The platform functionality is limited to registered companies therefore it was not possible to access further information. Despite the available funding options, researchers have noted a reduction in public budgets, which may limit financial support for artistic projects, leading some creators to turn to crowdfunding (Demattos Guimarães & Maehle, 2023, p. 944).

Participation and networking in events have a significant impact on improving the business opportunities for game developers. The regional film center Vestnorsk has established a department called Bakom, which operate as a hub and organizes events, summer courses and workshops for people up to 30 years (Norwegian Film Institute, 2023, p. 37) while the Kosmorama film festival, offers the opportunity to game developers pitch their ideas to future investors (Kosmorama, n.d.).

Startups and entrepreneurs can receive advisory support from Innovation Norway. This governmental agency is focused to support the development of Norwegian companies combining their expertise in regulatory and local market with the international networks (Innovation Norway, n.d.). Among the services offered for startups, this institution provides mentoring and advisory services, financial support in the form of loans and grants and free digital courses for strengthening the company member’s business skills. In terms of private funding, Kick-Ass Invest is focused on providing support to startup companies. Although not exclusively focused on videogames, their investment portfolio includes five game companies (Work-Work, n.d.) such as Riddlebit

(Norwegian Film Institute, 2023). Although it is not a VC firm specialized in the videogame industry, Snö is focused on supporting technological projects developed in the Nordics such as PortalOne, Fantasy Chess, Sceneri and Sky Mavis/ Axie Infinity which represent gaming companies, platforms and tools for game development (Snö.vc, n.d.).

Other interest and lobby associations that operate in Norway are Noneda, Spillmaker's Guild Norway and Vrinn. The cooperative Noneda offers courses, conferences, and seminars for game development companies (Noneda, n.d.). VRINN, with a focus on AR, VR, and gamification, unites public and private sectors, universities, startups, and museums (VRINN, n.d.). The Spillmaker's Guild Norway is an organization for videogame developers, professionals and amateurs alike, that arranges frequent social events in several cities to support networking among creators (Spillmakers Guild Norway, n.d.).

Two major gaming events in Norway are the Game Awards Norway and Konsoll. The Game Awards, organized by students at the Norwegian University of Science and Technology, celebrate industry achievements and offer networking and workshops (Game Awards, n.d.). Konsoll is a growing two-day conference featuring workshops and panel discussions, with a dedicated day for students (Konsoll, n.d.).

Every year, an approximate of 220 graduates from game-related areas join the workforce (Norwegian Film Institute, 2023, p. 47). By 2022, 6 Formal Educational institutions offer professional programs oriented to videogame development in Norway (European Game Developers Federation, 2022). Nord University has established a Bachelor's Degree in Games and Entertainment Technology (Nord, n.d.). The University of Agder offers a Bachelor's degree in Academic e-sports (University of Agder, n.d.) while the Inland Norway University of Applied Sciences offers a Bachelor's degree in Game Technology and Simulation (Game School, n.d.). Besides this, this institution offers also a short post graduate program of 1 year in Virtual and Augmented Reality that serves as a baseline for an upcoming master in Serious Games and XR scheduled to start in Autumn 2024 (Game School, n.d.).

The Arctic University of Norway offers a Master's Degree on Applied Computer Science allowing the graduates to work in a wide range of areas that include the Videogame Industry (UiT The Arctic University of Norway, n.d.). In a similar fashion, the Norwegian University of Science and Technology (NTNU) offers a program of Master of Science in Informatics (NTNU, n.d.) and a second degree In Applied Computer Science (NTNU, n.d.-a). This same institution offers a Master's program in Creative Music Technology where the students can apply their skills as audio lead for videogames (NTNU, n.d.-b).

Kristiania University College is a private institution that offers two different programs of 1 year of duration as Tertiary vocational studies in Game Development (Kristiania, n.d.) and Game Graphics and Animation (Kristiania, n.d.-a.) and a Bachelor's Degree in Game Design (Kristiania, n.d.-b.). Another private institution, the Noroff School of Technology and Digital Media offers a Bachelors Degree program in Interactive Media and Games both On Campus or remotely (Noroff, n.d.). The same institution offers a professional degree in 3D Arts and Game technology, with a focus on 3D Modeling, Texturing, Lighting and Animation (Noroff, n.d.-a) and a second degree in 3D Arts and Game technology focused on Interactive applications.

3.6 State of the Videogame Industry in Finland

Finland is considered a Strong capacity country in regards of videogame development, with a local ecosystem consistent of a multiplicity of studios, specialized investors and professional game education regardless of the small local market (Hiltunen et al., 2023, p. 15). The combined turnover of the local industry by 2021 was 3,200 million euros (Hiltunen et al., 2023, p. 48) almost to the same level as other countries as France and Germany (European Game Developers Federation, 2022, p. 11). 92% of this income generated by the companies that operate in the Capital Region however several companies with more than 1 million euros in annual turnover are also located in across different regions of the country (Neogames, 2022, p. 16).

By 2022, the country had 232 active studios registered, being the Capital Region (Helsinki, Espoo and Vantaa) the most prominent hub with 111 studios. Other cities have also an important number of companies registered: Tampere with 36 studios, Oulu 20 studios and the city of Turku with 17 studios. In Jyväskylä has 11 game development studios registered, while Kotka and Kajaani have 8 and 7 active studios respectively (Neogames, 2022, p. 14). It is estimated that there are 10 service provides in the local market directly linked with creating assets for other videogame companies (European Game Developers Federation, 2022). According to the study presented by Neogames (2022, p. 20), there are approximately 3700 full time employees working in Finland, while other 400 people are working abroad on Finnish owned studios. 22% of the workforce are women (European Game Developers Federation, 2022).

The videogame industry in Finland had an important surge in 2014 thanks to the success of the mobile games from companies such as Rovio and Supercell, and its growth has continued throughout the years, reaching the mark of 2,100 million euros in 2018 (Neogames, 2022, p. 24) as shown in the figure 16. The number of studios with a turnover over 100 million euros has increased to 5, while by 2022 there were 45 studios with more than 1 million euros in turnover (Neogames, 2022, p. 26).

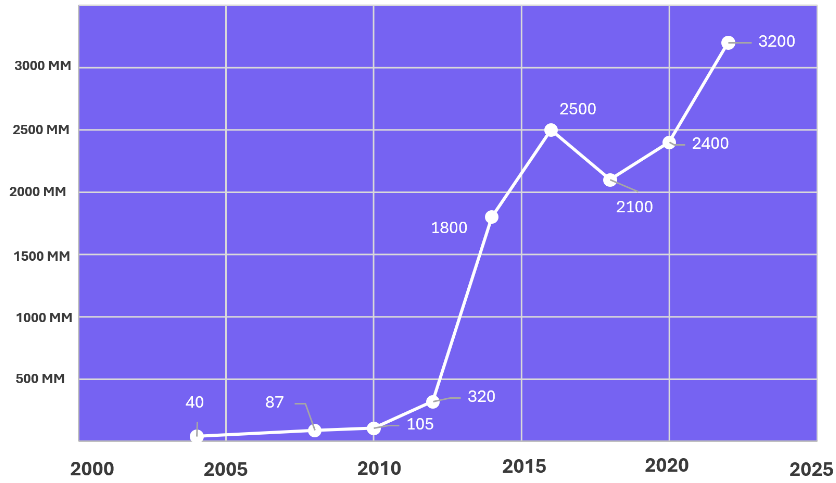

Figure 16. Evolution of Turnover of Videogame Industry in Finland. (Adapted from Neogames, 2022, p. 25).

The preferred platform used by developers are both PC and mobile, with 59% of the studios developing for two or more platforms (Neogames, 2022, p. 18). This shift from previous years development tendencies and is consistent with the future trends reported in the study by Newzoo (2024) that refers to Mobile developers switching to develop PC titles due to a more competitive market and new data privacy practices. In the report presented by the European Game Developers Federation (2022), 45 new titles were developed by 40 different Finnish developers in 2022, of which 89% were self-published and the rest of titles through external publishers.

The revenue per studio was not included on Neogames' report, therefore, to identify which are the most relevant companies in the Finnish videogame landscape on the financial aspect, a manual validation on the site Finder.fi (Finder, n.d.) was performed for each registry. This is a free service that collects essential data related to Finnish companies, including yearly financial results presented to the Tax Administration office. Although in the official site of the Finnish Patent and Registration Office detailed information of each company can be accessed, the reports must be purchased separately. The primary list to use for this purpose includes all the companies listed under the “Game Development and Publish” category in Neogames site that included 266 registries by June 2024 (Neogames, n.d.-b). Additionally, a secondary listing of 111 companies were obtained from the Business Information System YTJ under the Standard Industrial Classification “58210 Publishing of computer games”. Both lists were combined and resulted in 377 for which their financial status and results were. Based on the revenue registered in 2023, the top 15 companies based on their revenue are presented in Table 8.

Name	Registry Date1	Number of Employees[1]	Location[1]	Turnover Euros[1]*
Supercell	July 2010	360	Helsinki	1.400.000.000 €
Metacore / Everywear Games Oy	December 2014	148	Helsinki	161.600.000 €
Rovio Entertainment	November 2003	339	Espoo	58.000.000 €
Futureplay	February 2015	56	Helsinki	42.300.000 €
Next Games / Netflix Finland Oy	March 2013	128	Helsinki	36.300.000 €
Remedy Entertainment	September 1995	334	Espoo	33.900.000 €
Fingersoft	May 2016	110	Oulu	24.100.000 €
Housemarque	July 1995	101	Helsinki	17.200.000 €
RedLynx Oy	August 2000	141	Helsinki	12.100.000 €
Redhill Games	May 2018	69	Helsinki	10.300.000 €
NitroGames	August 2007	49	Kotka	8.800.000 €
Sulake / Fuse Oy	January 2006	55	Helsinki	8.100.000 €
Colossal Order	May 2009	24	Tampere	7.700.000 €
PanzerDog	May 2017	N/A	Helsinki	7.600.000 €
Valo Motion	August 2016	N/A	Espoo	7.400.000 €

Source: 1 Finder.fi *Financial Information corresponds to year 2023

Table 8. Top 15 Videogame Development Companies in Finland based on their Turnover in 2023. (Self Elaboration based on data from Finder.fi, 2023).

The Finnish mobile game developer and publisher Supercell is considered one of the biggest players in the European market over 1,700 million euros in revenue in 2023, although that amount considered a decrease of 4,2% compared to the previous year (McEvoy, 2024) that could be explained, among other factors by the company withdraw from the Russian market as a consequence of the war in Ukraine, losing 12 million players (Shuai, 2024).

The company established in 2010, has a main office in Helsinki and through the years has expanded operations to other locations such as San Francisco, Seoul and Shanghai having a total headcount of over 625 employees (Supercell, n.d.). Up to this date, Supercell has released 6 games, all of them Mobile action games for both Android and iOS and using the Free to Play monetization scheme with 250 million monthly players in total (Neogames, 2022, p. 138). In 2016, Tencent acquired 84,3% of Supercell's shares with an investment of about 8,000 million euros as an effort from the Chinese company to expand to North American and European markets (Shuai, 2024).

Rovio Entertainment is also focused on mobile games with a powerful global IP *Angry Birds* that has expanded to other consumer products including movies (Neogames, 2022, p. 130). In 2022, Rovio Entertainment, generated 317.7 million euros in revenue, with 96,5% of the income corresponding to revenue produced by games sold and in-app purchases (Clement, 2024).

Next Games is a game studio founded in 2013 specialized in mobile games with a strong component of the income based on in-app purchases. In 2022 Netflix acquired the studio for an amount close to 65 million euros. The team developed a puzzle RPG game under the IP of Stranger Things called *Stranger Things: Puzzle Tales* (Next Games, 2022) which would only be accessible through the Netflix platform and wouldn't have any freemium monetization scheme (Le, 2022). Before this transaction, the studios' revenue in 2022 was estimated at 23.7 million euros (Finder, n.d.-b.)

Remedy Entertainment is a renowned developer since its early beginning in 1995 thanks to the strong IP of both *Max Payne (Remedy Entertainment)* and *Alan Wake (Remedy Entertainment)* and the release of other acclaimed PC titles such as *Quantum Break (Remedy Entertainment, 2016)* and the action-adventure game *Control (Remedy Entertainment, 2016)*, heavily focused on narrative and storytelling and where the characters and events, with standalone experiences taking place on the same universe (Egan, 2023). The company has shown a steady growth in revenue since 2011 (Clausnitzer, 2023) although the results on both revenue and profit were heavily impacted in 2023, declining 24% from 43.6 million euros in earnings in 2022 to 33.9 million in 2023 with an operational loss of 28.6 million euros despite the positive reception from fans and critics for the awaited PC game *Alan Wake 2 (Remedy Entertainment, 2023).* Remedy became a public company in May 2017 and is currently traded at Nasdaq Helsinki.

Ubisoft Redlynx is a multiplatform studio located in Helsinki that was founded in the year 2000 and was acquired by the French game publisher Ubisoft in 2011. The first game the studio published was a racing game called *Trials* (Ubisoft Redlynx, 2000). Ubisoft Redlynx has developed Free to Play mobile games under Ubisoft's IP such as an upcoming *Tom Clancy's Rainbow Six Mobile* (ETA 2025) and the latest release *Gwen's Getaway* (Ubisoft, 2024) a puzzle decoration game (Ubisoft Redlynx, n.d) was cancelled in October 2024 after being in soft launch for a few months (Cook, 2024). The revenue of RedLynx reached 11.8 million euros in 2022 (Finder, n.d.-a.).

Housemarque was founded in 1995, and thoroughout its trajectory has released games on multiple platforms such as Amiga, PC, Xbox, Xbox 360, PS3, PSVita while the more recent games, such as *Alienation* (Housemarque, 2016), *Matterfall* (Housemarque, 2017), *New Machina* (Housemarque, 2017), and *Returnal* (Housemarque, 2021), have been exclusive launches for PS4 and PS5.

Sulake is the studio behind the *Habbo* online community which started in the year 2000 and that based the economy of the platform on microtransactions that allowed users to customize their rooms and has currently a mobile version (Sulake, n.d.). *Hotel Hideaway*, an online game is other of the releases of the studio. In 2022, Sulake's revenue was 11.5 million euros (Claunitzer, 2023).

Colossal Order, is a game development studio established in Tampere in 2009 and the first release was a transit system simulator *Cities in Motion* (Colossal Order, 2011) and its sequel in 2013. The city builder *Cities: Skylines (*Colossal Order, 2015*)* became a substitute for fans of the City Building genre that were dissatisfied with *SimCity* (EA, 2013) allowing the company to obtain a big fanbase that was cemented thanks to the release of DLCs and allowing the participation of the players through a robust modding system (Calvin, 2022). With the release of the sequel Cities: Skylines 2 (Colossal Order, 2023) Colossal Order received critics due to the game performance issues and lack of content, forcing the company offer to refund the first DLC package (Velocci, 2024) and delaying the launch to consoles in order to focus in improving the current state of the game (Carter, 2024). Colossal Order's sales figures by 2022 were 6.8 million euros and in 2023 increased to 7.7 million euros (Finder, n.d.-c.)

Several lobby associations operate in Finland: NeoGames is an umbrella organization that supports the game industry and functioning as a link between the different stakeholders including public and private sectors, research, education and talent in the country. The organization arranges workshops and meet-ups, prepare a yearly report with the State of the Industry in Finland and keeping an active profile in multiple events such as game awards, game jams and pitching sessions that take place in the country throughout the year (Neogames, n.d.). In previous years, Neogames has participated in several projects such as the Baltic Game Industry producing several documents to support the strengthening of the local dev community. Currently, Neogames is focused on the project Gamebadges, co-founded by the European Union which aims to map defined competences for different professional roles within the game industry helping to stablish a framework of skills and corresponding courses with the support and participation of several associations and educational institutes across Europe (Neogames, n.d.-a) as well as cooperating in the project STRATEGIES (Sustainable Transition for Europe's Game Industries) that is oriented to improve the working conditions, business infrastructure and business models to align them with innovative and environmental practices and promote behavior changes in the players (Strategies, n.d.).

The Finnish Game Developers' Association (Suomen Pelinkehittäjät) is a cooperation body focused on companies whose main business is related to game development. The meeting and events, oriented to influence public decisions and establish and nurture international contacts, are organized by Neogames Finland. By 2020, the organization had more than 80 members, around a third of the total of development companies in the country (Pelinkehittajat, n.d.). The International Game Developers Association has a Finnish chapter founded in 2012 and its purpose is the connection of game developers, promoting career development in the industry and nurturing the local community through events and meetups supporting in particular local hubs in cities such as Turku, Tampere, Jyväskylä, Kymenlaakso, Pori, Vaasa, Outokumpu-Joensuu, Kajaani, Oulu, Rovaniemi, Kuopio, Lahti and Porvoo (IGDA, n.d.).

Another example of an organization that supports the local ecosystem in Finland is We in Games, an NGO that promotes diversity, equity and inclusion in the Finnish game industry by organizing networking events and mentorship programs (We In Games, n.d.) and in a similar way, participants of the NGO We love Games, can also benefit of the events and workshops that are organized across the country (We Love Games, n.d.). The Finnish Game Jam supports the videogame development as a hobby, organizing diverse game jams and events both online and in person with different themes. It also provides a scholarship support to participants, to facilitate them the opportunity to attend to international jamming events and organizes the annual Finnish Game Jam Awards (Finnish Game Jam, n.d.).

The labor union of game developers of Finland is called Game Makers of Finland and workers or students of the videogame industry can join as members, acquiring professional security and other benefits such as employment and salary counseling, networking and mental health support (Peliala, n.d.).

Other organizations that are related to the Videogame Industry are the Helsinki XR Center and the Finnish Virtual Reality Association FIVR. The first operates a link between startups, developers and students offering access to its members to a showroom equipped with a diverse range of devices, organizing networking events and participating in several research projects alongside Metropolia University of Applied Sciences (Helsinki XR Center, n.d.). FIVR, as a Nonprofit organization promotes the advancing of the VR and AR community in Finland offering consultation and support to developers, allowing them to utilize equipment in cooperation with other institutions such as Aalto Studios and Turku GameHub among others (FIVR, n.d.).

In the city of Turku also operate an important Game Hub: the Turku Game Lab, as part of the University of Turku, facilitates services in game development and research including testing, usability and specific solutions for the industry (Turku Game Lab, n.d.); Turku Game Hub organizes events and workshops for individual game developers and companies (Turku Game Hub, n.d.) while the research group of the Turku University of Applied Sciences called Futuristic Interactive Technologies is focused on developing product innovations and solutions in game technology related to serious games, augmented and virtual reality and gamification (TUAS, 2022).

Tampere is another vibrant hub for game development. Several organizations, universities and companies form part of the ecosystem supporting the startups and indie developers in Tampere. Among them, the Tampere Game Hub is recognized as an umbrella organization that promotes networking, events and incubator programs free of charge for game development companies and teams (Tampere Game Hub, n.d.); Platform 6 offers co-working spaces as well as access to an investor network, arranging networking and pitching events (Platform 6, n.d.) and TribeTampere offers mentorship, networking and pitching events focused to entrepreneurs and startups (Tribe Tampere, n.d.).

The Kymenlaakso region is supported by the presence of the R&D projects developed by the Xamk University of Applied Science and its program Xamk Game Studios that promotes the cooperation between companies proving technical assistance to startups and developers (Xamk, n.d.) while in Jyväskylä the Peliosuuskunta Expa – Jyväskylä Game Industry Hub operates as an open community oriented to game development serving as a platform for networking and training for both technical and entrepreneurial skills through the Digi & Game Center (Expa, n.d.). In Kajaani, a three-year project was established by the city of Kajaani with the goal of supporting the startup ecosystem of game development in the Kainuu region through an incubator and accelerator program (Game City Kajaani, n.d.). Espoo Game LAB started operating in 2024 funded by the EU to support aspiring developers to acquire skills in game design, programming, game production and business development (Espoo, n.d.).

There are 37 formal institutions and 5 non-formal institutions with programs dedicated to Game Development across Finland (Hiltunen et al., 2024, p. 48). A wide range of alternatives are offered for professionalization in the field, among them can be cited Aalto University that offers two different Master programs: Master of Arts in Game Design and Development and a Master of Science Game Design and Development while in previous years an Erasmus program called The European Game Design Masters was also offered to students (Aalto, n.d.; Aalto, n.d.-a; Aalto, n.d.-b). In the University of Tampere, a Master program in Game Studies focused on Social Sciences is offered. The particularity of this program is that it is heavily oriented to the cultural aspect of games and play and its impact on society (Tuni, n.d.). Kajaani University of Applied Sciences presents a robust offer with three Master Degree programs in Game Business Management, with two of them being a part time program, which allows participants that are already involved in a professional career to further their studies; and offering as well one Bachelor Degree in E-sport Business and a Bachelor's Degree in Business Information Technology with focus on Game Development (KAMK, n.d.; KAMK, n.d.-a; KAMK, n.d.-b; KAMK, n.d.-c).

Metropolia University of Applied Sciences offers a program that graduates students as Bachelor's of Culture and Arts in XR Design (Metropolia, n.d.) while Jyväskylä University of Applied Sciences has a program of Bachelor of Business Administration in Game Production which helps students prepare for future roles as Producers, Game Designers, 3D Artists or Art Directors (JAMK, n.d.). In a similar way, South-Eastern Finland University of Applied Sciences, also known as XAMK, offers a program of Bachelor of Culture and Arts in Game Design allowing participants to develop their skills in practical projects related to game design, game mechanics and monetization (XAMK, n.d.-a.). In addition to the previously mentioned programs, these institutions offer several courses open to the general public focused on 3D modeling, animation, programming, game design and gamification. It is also relevant to mention the Centre of Excellence in Game Culture Studies that serves as a joint effort between the Tampere University, University of Turku, and the University of Jyväskylä to advance the research of games and play and their impact in society and culture presenting publications in the form of journal articles and books (CoE, n.d.).

Business Finland offers the companies the possibility to access to either grants and loans to start or further their organizations for developing new game concepts, new tools, products or business models. To apply, the company should be registered in Finland, have a team with enough game business experience and own funding to operate. Once these requirements are covered, the companies can apply for any of the three different instruments: Tempo Funding in a first instance offers a grant up to 60.000 euros to develop an MVP or testing a new market; Research, Development and piloting funding in the form of a loan of up to 100.000 euros, and a in a third instance the Young Innovative Company Fundings that provides a combined grant and loan up to 1.250.000 euros to help scale up and existing business (Business Finland, n.d.) as shown on Figure 17 below.

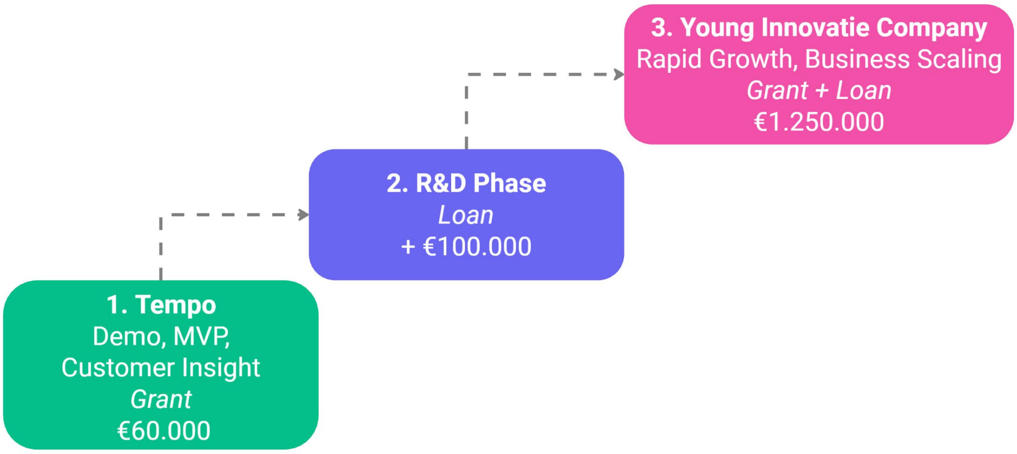

Figure 17. Funding available through Business Finland organization. (Adapted from Business Finland, n.d.).

AVEK Audiovisual Center also offers financial support to Game Development companies through CreaDemo and DigiDemo grants. Both grants are structured in two scopes: Demo and Pilot Support, which can only be accessed by registered companies with at least 6 months since its inception while the Concept Support can also be allocated to private individuals to help the development of an idea into a finished concept. For the Concept planning, an amount of 5.000 euros can be granted while the Demo and Pilot Support can cover up to 80 percent of the costs with a maximum of 20.000 euros, considering that the development team or other sources are bound to cover the other 20%. The applicants can also justify the self-financing by including the cost of their own work hours, which are established by the organization at a maximum of 19 euros / hour (Kopiosto, n.d.) as shown in the figure 18 below.

Finland has long been recognized as a global leader in entrepreneurship and innovation, with a robust ecosystem that fosters the growth of new businesses ranking among the top countries in the world for entrepreneurial activity and innovation (Ács et al., 2017, p. 24). One key aspect has been its focus on cultivating an educational environment that encourages entrepreneurship through education. Finnish universities have been at the forefront of this movement, implementing programs and initiatives that expose students to the principles and practices of entrepreneurship (Huoponen, 2018, p. 23). Additionally, the government has provided funding and resources to support the development of new businesses, particularly in emerging industries (Komi et al., 2015, p. 6).

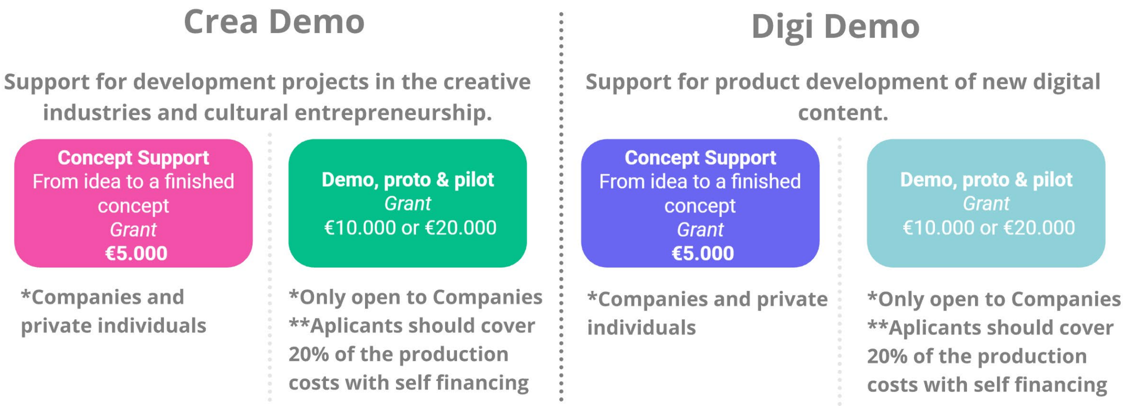

Figure 18. Crea Demo and Digi Demo support schemes. (Self-Elaboration).

Policymakers have also worked to create a favorable business environment, with initiatives aimed at reducing administrative burdens, improving access to financing, and fostering collaborations between the public and private sectors. Among the public mechanisms that exist in Finland, the Start-up grant-support is a stipend that is offered through the Employment and Business Office (TE-toimisto) with a duration of up 12 months and can accrue as a maximum 740 euros per month, in particularly for those that want to have a full-time dedication to a new business endeavor (TEM, n.d.). The Enterprise Europe Network is a structure that supports the internationalization of small and medium companies proving advisory support regarding how to access to European funding as well as arranging matchmaking and networking events (EEN, n.d.) while the EU Financial advisory services has a national chapter in Finland that helps to offer a centralized hub of information for all the financial instruments, including grants and tenders across the European Union providing support to the applicants to obtain a positive result in their postulations (EU-Rahoitusneuvonta, n.d.).

Finnvera is a state-owned financing company that is oriented to help start-ups and entrepreneurs to finance their operations to grow and expand their business to international markets. This company provides financial instruments that operate as collateral for other institutions such as banks when an entrepreneur is applying for a loan but is not able to comply with the warranty that the banks request. The organization also offers advisory services without cost and have offices in several locations across the country (Finnvera, n.d.).

Venture capital firms benefit from their capacity to identify and support early-stage projects (Vetter, 2014, p. 21) while trying to overcome the uncertainty of the potential success of the startup organizations that are backing up. Those with a specific industry-focus can better understand the unique challenges and opportunities within a sector, enabling them to provide more tailored support and guidance to their portfolio companies and in some cases incubate the ideas directly (Lerner & Nanda, 2020, p. 256).

In Finland, several specialized Venture Capital and Angel investor firms operate. Sisu Game Ventures functions as an early-stage venture capital fund focused on videogames and videogame related technologies supporting in some cases the startups through further rounds of funding (Sisu, n.d.). In a similar way Play Ventures invests in about 12 new companies every year with a particular focus on those that feature a Free to Play monetization system and an initial investment of about 450.000 euros to 900.000 (Play Ventures, n.d.) The renowned mobile developer Supercell also has established a Venture Capital firm backing up other studios with diverse backgrounds and focus (Supercell, n.d.-a.). Another organization that operates within the Finnish Ecosystem is Fiban which plays a role as a link between Angel Investors and Startups proving a comprehensive registry of Angel Investors and organizing pitching events (Fiban, n.d.). According to their statistics, in 2023 26 million euros were invested in 173 startups, being the Software development the sector with higher support with 20% (Fiban, n.d.-a.).

4 Theoretical Framework

Several theories can be used to understand and analyze further the complex dynamics that occur in the indie game development ecosystem and the potential implications that can be derived from it. In this section a review of three relevant managerial and socio-economic theories are presented, each offering a unique lens through which to interpret the challenges faced by indie developers and the structures that shape their environment.

By connecting empirical observations with these established theoretical concepts, the research contributes to a deeper understanding of how different factors interact within these ecosystems and how targeted support strategies can be developed.

4.1 Triple Helix Model

The Triple Helix model established by Etzkowitz and Leydesdorff in 1995 emphasizes the dynamics among academia, industry, and government, for fostering innovation, economic growth, and social development (D’Alise & Giustiniano, 2014; Razak & White, 2015).

Academia, represented by universities and research institutions, serves as a hub for knowledge generation and dissemination (Etzkowitz, 2004, p. 71) cutting-edge research, fostering intellectual capital, and nurturing the next generation of innovators. Academia's role involves conducting fundamental research, developing new technologies, and cultivating a skilled workforce and act as incubators for new ideas and technologies (Etzkowitz et al., 2000, p. 319). By bridging the gap between basic and applied research, universities can help startups improve their options on innovation and commercialization (D’Alise & Giustiniano, 2014).

The industry, which includes businesses and enterprises, plays a crucial role in the commercialization and application of research outcomes bridging the gap between theoretical knowledge and practical implementation, and helping to implement academic discoveries into marketable products, services, and processes (D’Alise & Giustiniano, 2014). The government provides the regulatory framework, funding, and policies that shape the innovation landscape through several initiatives, such as tax incentives, research grants, and general regulations to create an enabling environment for startups to thrive (Eglītis et al., 2012, p. 61).

The Triple Helix model recognizes that effective collaboration and synergy among academia, industry, and government are crucial for driving innovation and enables startups to overcome innovation challenges, access crucial resources, and ultimately achieve greater success (D'Alise & Giustiniano, 2014; Pique et al., 2018, p. 6). Each sphere, while retaining its primary role and identity, complements and overlap each other, for example, universities taking the role of industry in supporting start-up creation in incubator and accelerator projects (Pique et al., 2018, p. 17). Figure 19 represents the overlapping of each sector, Government, University and Industry, and the contributing elements, combining their strengths to foster innovation, research, and development. Where Government and University intersect, government grants and policies may support academic research and knowledge transfer; The intersection between University and Industry highlights collaborative research opportunities, with industry providing practical training and placements while universities contribute academic expertise while the overlap of all three sectors implies a holistic approach with policies, funding, knowledge, and research coming together to drive innovation and progress.

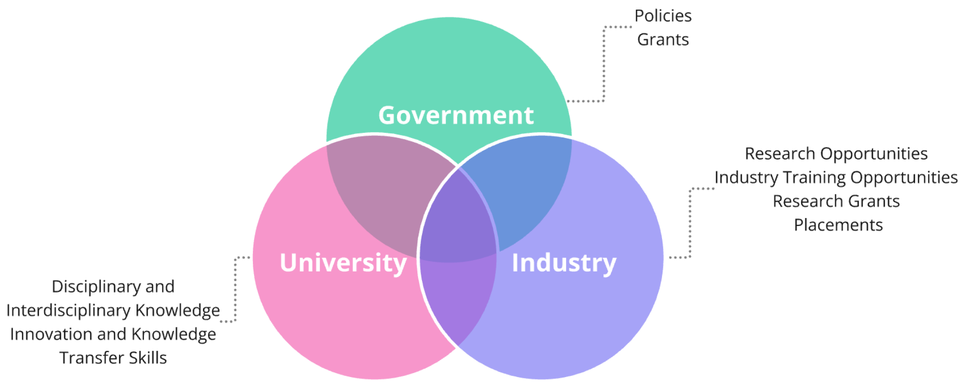

Figure 19. Triple Helix Model. (Adapted from Yang, 2021).

According to D'Alise & Giustiniano (2014) the factors that contribute to the success of startups in a Triple Helix ecosystem include access to cutting-edge research and new technologies from universities, collaboration with industry partners for commercialization and market access, supportive policies, funding, and infrastructure from government while Pique et al. (2018, p. 6) also reflects on the importance of acknowledging the particular regional and cultural settings and interactions.

4.2 Entrepreneurial Ecosystem Theory

The entrepreneurial ecosystem theory refers to the interconnected set of actors, resources, and institutions committed to long-term development through the assistance, creation, growth, and development of new businesses (Kansheba & Wald, 2020, p. 14) and these actors are connected through a geographical location and community (Cohen, 2006, p. 2). For Isenberg (2010, p. 3) the entrepreneurship ecosystem brings together certain unattainable elements such as culture, leadership, financial support and customers combining them.

Surrounding the entrepreneurs are a range of supporting elements, such as access to funding, such as venture capital, a skilled workforce, infrastructure, and a conducive regulatory environment (Kansheba & Wald, 2020, p. 14). These elements work together to create an environment that fosters innovation, risk-taking, and the successful commercialization of new ideas.

The impact of the entrepreneurial ecosystem on financial success considers that the availability of resources and support can positively contribute to the financial performance of entrepreneurial ventures (Banning & Chinta, 2019, p. 27). Access to funding is a critical factor, as it enables entrepreneurs to acquire the necessary resources to start and grow their businesses (Kansheba & Wald, 2020, p. 25). By examining the interconnexion between entrepreneurs, resources, and the broader ecosystem, researchers and policymakers can develop strategies to support the growth and development of the entrepreneurial communities (Kansheba & Wald, 2020).

Figure 20 illustrates the key elements, outputs, and outcomes of an entrepreneurial ecosystem and how they are interconnected. At the base of the diagram, the Entrepreneurial Ecosystem is composed of several key elements: Resource endowment which includes Infrastructure, support services, human capital, demand, knowledge, finance, education, and innovation are crucial resources that contribute to the growth of entrepreneurial activity. Institutional arrangements such as Policy and governance, culture, and networks create a supportive environment for entrepreneurship, influencing its development. When the entrepreneurial ecosystem is functioning effectively, it leads to productive entrepreneurship as an Output. This arises from the optimal combination of the resources and institutional factors within the ecosystem. Productive entrepreneurship refers to innovative and growth-oriented business activities that generate value in the economy. The ultimate Outcome is economic growth. This serves as the overall goal or outcome of a well-functioning entrepreneurial ecosystem, contributing to national or regional economic development through increased business activity, job creation, and wealth generation.

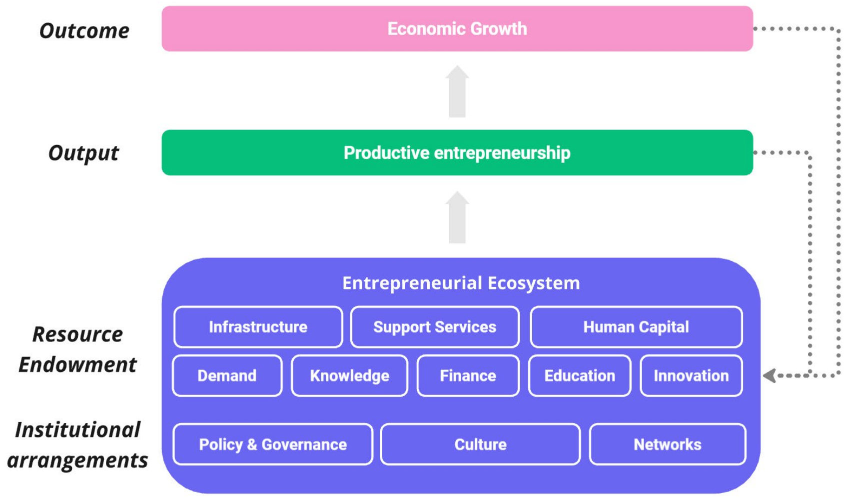

Figure 20. Entrepreneurial ecosystem. (Adapted from Leendertse et al., 2022).

4.3 Community of Practice (CoP)

The theory of Community of Practice (CoP), primarily developed by Jean Lave and Etienne Wenger (1991), provides a robust framework for understanding how individuals acquire skills and knowledge in various settings This theory emphasizes that a group of people that share an interest in a topic they actively take part in is capable of improving their performance by sustaining interactions and sharing experiences with each other. That knowledge is cemented by three key elements: domain, community and practice as illustrated in Figure 21.

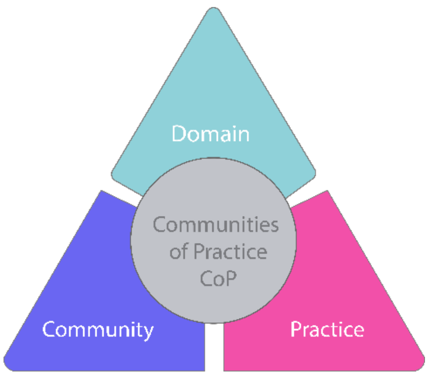

Figure 21. The Three factors that conform the Communities of Practice. (Self-Elaboration).

As described by Wenger (1999) the domain represents the shared topic or that is capable of distinguish them from other individuals; the community implies that the members interact with each other and share knowledge either on a formal or informal basis while the practice indicates that the members of the community of practice are actively performing actions related to their particular interest (Wenger, 1999, p. 1-3).

Communities of Practice can take different forms, ranging from informal networks, supported structured groups established by the organization as a way to promote the knowledge sharing and impulse the collective towards the business goals (Jordan et al., 2015).

Although the CoP concept was formally introduced in 1991, Wenger et al.(2002, p. 5) argue that such communities have existed throughout human history, evolving alongside civilization. Over the past three decades it has been increasingly integrated into managerial and educational practices as a way to share and spread knowledge (Jordan et al., 2015; Li et al., 2009). Participation within a CoP often begins with peripheral roles and as the knowledge and expertise start building up their role evolves to a central position (Llewellyn & Hindmarsh, 2010, p. 2018). Within the context of CoP, the role of schools and formal education centers transitions from a restrained form into a builder of new connections to reach out to external communities and as sustained support for students once their academic process ends (Wenger, 1999, p. 5).

This theory results particularly relevant in the context of Indie Game Developers, developers engage organically in practices of experience sharing and informal mentorship within the ecosystems they belong to, through online platforms like Discord, Reddit, or itch.io, as well as local game jams and meetups. These communities act as informal ecosystems where knowledge is socially constructed, and newcomers learn from experienced developers. Through these interactions, discussions and feedback process indie developers not only acquire technical skills but also forge professional identities rooted in the culture and values of the game development community.

5 Methodology

This study is focused on identifying the challenges faced by indie game developers from a pragmatic perspective and an abductive approach, utilizing the format of a Qualitative Case Study. To collect empirical data, a series of semi structured interviews were held and further analyzed employing Reflexive Thematic Analysis. This section provides a detailed overview of the research problem and outlines the research strategy employed to address it, including the chosen methodology and its relevance for answering the research questions.

5.1 Research Problem

In the context of the videogame industry, independent developers face unique challenges that significantly affect their ability to create successful games, particularly when the market is dominated by multinational companies based in Asia and USA (European Commission, 2023, p. 56) and the capacity in Europe for game distribution and publishing is limited (Hiltunen et al., 2024, p. 13).

Another aspect of the research problem lies in the interaction between independent developers and the ecosystem of academia, industry, and government where the relationship between these sectors can influence the development and market success of independent videogames (Razak & White, 2015) taking into consideration the particularities of each country (Pique et al., 2018, p. 6). The entrepreneurial ecosystem in these countries can facilitate the success of developers, by facilitating access to venture capital, business mentorship, and infrastructure (Fischer, 2019, p. 15) and benefiting the economic development of the region (Kansheba & Wald, 2020, p. 31). Identifying the barriers within this ecosystem is crucial for understanding how independent developers can better integrate into these support structures and ultimately achieve success in a competitive market.

The aim of this thesis centers on identifying the specific obstacles these independent developers encounter during the game development process in Latvia, Estonia, Norway and Finland with the purpose of providing actions oriented both to independent developers and to other actors within the ecosystem that could help improve the chances of success in both local and international markets.

5.2 Research Questions

The present study will analyze the challenges faced by independent videogame developers when creating a success videogame by answering at the following questions:

Main Research Question:

What obstacles do independent videogame developers encounter during the development process in Norway, Estonia, Latvia and Finland?

Support Research Question 1:

What are the primary sources of funding for independent videogame developers in Norway, Estonia, Latvia, and Finland and what challenges do they face in securing investment?

Support Research Question 2:

What role do support systems such as incubators, accelerators, and mentorship programs play in the success of independent videogame developers in Norway, Estonia, Latvia, and Finland?

5.3 Research Philosophy and Approach

Research philosophies help define the overall research process by providing a broad framework that guides how investigations are conducted, and influencing the methods of data collection and the techniques used for analysis (Bhatta, 2018, p. 73). A research philosophy essentially represents the stance a researcher takes regarding the development and nature of knowledge (Saunders et al., 2015, p. 107). As depicted in Figure 22, known as Saunders’ "Research Onion" (Saunders et al., 2015, p. 108), researchers can adopt several philosophical positions which align with various layers of the research process, from broad theoretical approaches to specific data collection techniques.

Among the diverse research philosophies, positivism assumes that there is one objective reality that can be studied and understood (Pickard, 2013, p. 8). In contrast, interpretivism suggests that multiple realities exist, shaped by the individual contexts and experiences of the participants. This view emphasizes the subjective nature of reality and the need for researchers to understand it from the participants' perspectives (Bhatta, 2018, p. 73). Constructivism focuses on how knowledge is socially constructed within communities or groups (Fodouop Kouam, 2024, p. 135). The researcher, in the case of constructivism, employs the participants inputs as a baseline for a derived theory (Kaushik & Walsh, 2019, p. 2).

Pragmatism, chosen for this research, is a flexible philosophy that accommodates both singular and multiple realities. It allows for an open-ended approach where different methods and viewpoints are considered valid as long as they lead to practical solutions or meaningful insights (Kaushik & Walsh, 2019, p. 3, citing Creswell & Plano Clark, 2011). Pragmatism is often adopted by researchers who prefer not to commit strictly to either positivism or interpretivism but instead employ whichever approach suits the research question best.

To answer the research questions and given the exploratory nature of the topic, pragmatism is considered a suitable philosophical perspective since it emphasizes the practical application of research and focuses on answering the research problem (Johnson & Onwuegbuzie, 2004, p. 17). In pragmatism, the research questions are the most relevant aspects and allow the researcher to integrate diverse perspectives to facilitate the collection and analysis of the data (Creswell et al., 2011). This philosophy considers that the acquiring of knowledge is a continuous process and motivates the researcher to iterate between a deductive and inductive approach, commonly referred as abductive (Kaushik & Walsh, 2019, p. 6).

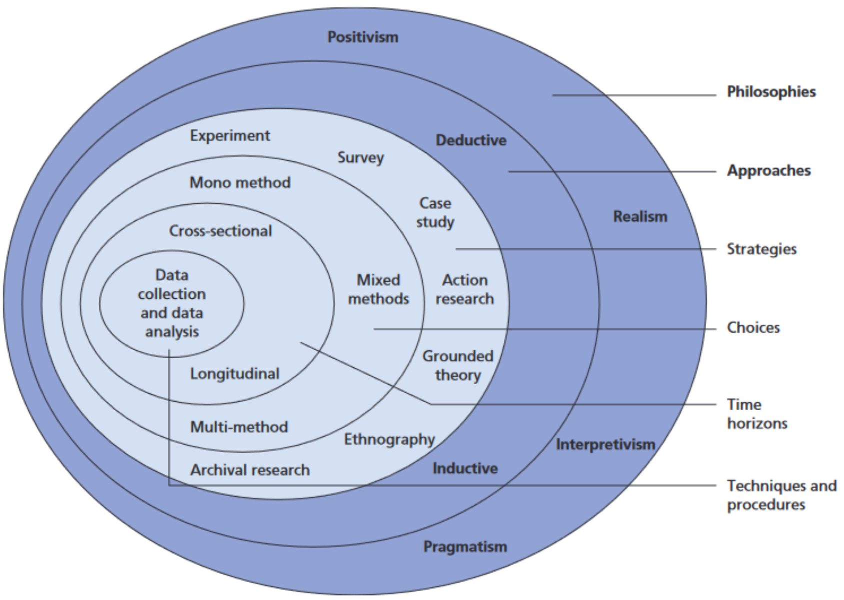

Figure 22. Saunder’s "Research Onion". (Saunders et al., 2015, p. 108)

Regarding the methodological approaches, a deductive approach aligns with positivism, where the researcher begins with a theory or hypothesis and designs an experiment to test it. This approach seeks to either confirm or refute the hypothesis through empirical data (Abbott & McKinney, 2012, p. 21). Conversely, the inductive approach is more common in interpretivism and constructivism. Here, the researcher collects data first and develops a theory based on patterns and insights emerging from the data (Pickard, 2013, p. 267).

In addition to these two primary approaches, abduction serves as a middle ground between deduction and induction. Abduction allows researchers to iteratively collect data, develop theories, and refine those theories based on further data collection and analysis (Mitchell, 2018, p. 105). This approach offers a more dynamic and flexible path to knowledge generation, accommodating the evolving nature of research findings. The abductive approach takes into consideration previous theories, in comparison to an inductive approach, providing a grounded robustness to the research without losing flexibility when compared to a deductive approach (Rashid et al., 2019, p. 4) which makes it particularly useful when the information is incomplete, and a plausible hypothesis needs to be developed from the initial observations. Considering this, the approach selected for this Thesis is the abductive approach.

5.4 Research Strategy and Research Methods

Qualitative Research considers a broad range of techniques with the focus of studying social life and can be performed through different strategies such as Ethnography, Grounded Theory, Phenomenology, Action Research or Case Study (Saldana, 2011, p, 3). For this thesis the research strategy selected is a Multiple Case Study framed into a pragmatic research philosophy with an abductive approach.

Although multiple definitions of Case Study can be found in the literature, a case study is defined as the study of a unit or entity analyzing in depth the interrelationships based in observation (Kothari, 2004, p. 113). This thesis applies qualitative research to gain a comprehensive understanding of the problem and contributing to actionable outcomes.

5.5 Data Collection and Data Analysis

The data or information required for the research can be acquired directly for the first time by the researcher through experiments, observations or interviews or be obtained from secondary sources meaning that other individuals or institutions have collected and processed them previously (Mazhar et al., 2021, p. 6). This study considers the process of qualitative data collection and analysis through Thematic Analysis. Thematic Analysis offers a method to analyze, organize and interpret qualitative data in a systematic way with the purpose of developing themes and find meaning to a particular phenomenon (Braun & Clark, 2021, p. 4). For this purpose, semi-structured interviews were conducted with experts across the four countries to gather in-depth insights into their experiences, perspectives, and challenges they have faced in their local ecosystems. Interviews allow to document the expressions of opinions, feelings and experiences of the interviewees (Saldana, 2011, p, 32) and can be either highly structured, semi structured or open, based on the degree of formalization of the questions and how the process is handled yet the main concept of an interview is an oral discussion about certain topic with the intention of collect information (Kumar, 2018, p. 339). Semi-structured interviews allow the researchers to have a predetermined list of questions that can be altered, either by omitting or including additional themes as the researcher seems fit to expand additional elements and answer the research questions (Kothari, 2004, p. 97).

The sampling strategy combined purposive and snowball sampling to reach indie game developers and ecosystem stakeholders across Norway, Estonia, Latvia, and Finland. Purposive sampling targets industry experts, representatives from game developer associations, and policy makers as well as independent game developers active in these countries, selected based on their roles and experience to ensure relevance to the research questions.

Snowball sampling consists in asking initial interviewees to refer other potential participants from their networks (Kumar, 2018, p. 190). This method is particularly useful in reaching developers who may not have a public-facing presence but hold valuable perspectives on the challenges within the ecosystem. The snowball method also enables a more natural progression of the sample group, creating a networked understanding of the ecosystem through connected participants.

The process of recruiting participants considered in a first instance reaching direct contacts from the NoBaN Network and extending to other individuals through social media such as LinkedIn, Facebook and Discord groups related to independent game development such as Games Dev

Network, Finnish Game Jam, XR4 Europe, We <3 Games, Estonian Game Development among others. Appendix 2 shows a standard message a sent previous to the interviews.

The criteria for selecting participants were primary their involvement in the Videogame Industry within the four countries pertinent to the research and their availability and interest in participating.

5.6 Research Schedule

The project is estimated was executed within 11 months from its beginning. The process was complex and laborious and was structured in a series of consecutive phases: Topic Selection and Initial Planning, Literature Review, Research Design and Methodology, Presentation of the Research Plan, Data Collection, Data Analysis, Thesis writing, Submission and Defense. This process started in April 2024 and was completed by May 2025. Figure 23 presents a Gantt chart outlining each of these steps. The preliminary research process took place between April and May 2024 and the Topic Selection was completed in May 2024. The literature review and Research Plan was developed between June and October 2024 considering the presentation of the Research Plan to take place by October 30th. The qualitative phase considering the interview with experts took place between November 2024 and January 2025. The Result Analysis and conclusions were completed during February and April 2025 establishing then a Thesis Ready Presentation date for May 2025.

5.7 Ethical Considerations

In the context of research, it is fundamental that the potential risks or damage that might be infringed to the subjects be assessed, and the participants' rights should be protected (Abbott & McKinney, 2012, p 56-57). This study adheres to the ethical standards of KAMK, which aligns with the Finnish National Board on Research Integrity guidelines (KAMK, 2024) and according to Finnish legislation and international ethics principles.

Participation in both the interview and survey phases was entirely voluntary, with participants free to withdraw at any time. Consent forms were provided in electronic format, detailing the study's purpose, the use of collected data, and the rights of participants. The form is presented in Appendix 3. Data was anonymized, omitting personal information such as company names that could allow readers to identify the interviewees and all transcription documents used an identification acronym for referencing purposes. Identifying information (e.g., names, emails) were stored in a separate, password-protected database accessible only to the researcher.

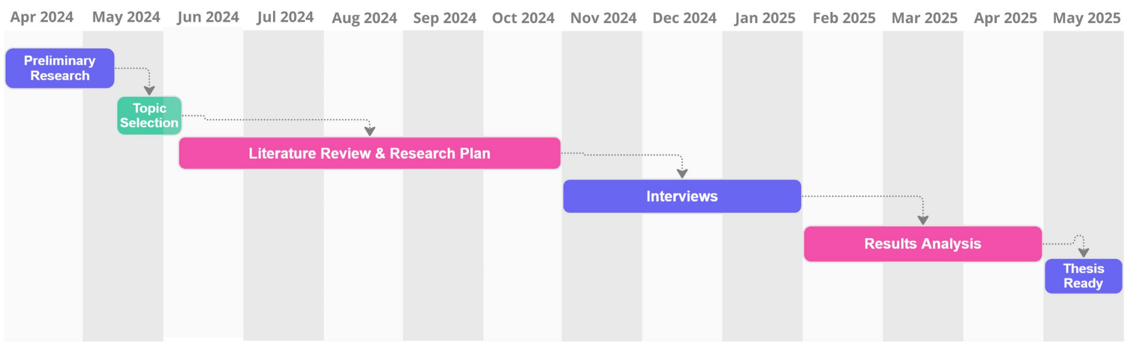

Figure 23. Gantt Chart of the research Plan of the Thesis. (Self-Elaboration).

6 EMPIRICAL RESULTS

6.1 Participants Characteristics

A total of 12 interviews were held with participants from Norway, Estonia, Latvia and Finland. The background of the participants provided a wide variety of experiences and perspectives. The participants tend to have multiple positions and roles, several working at Academia, some in their indie studio and several other participate in support organizations.

In table 9 the participants are described according to their own definitions whereas from Figure 24 it is possible to identify that most of the interviewees have a role in a Company parallel to role in a support structure, three of them work in their own companies without other roles while two of the interviewees work solely in Academia. One of the interviewees, however, has a triple role in Academia, a company and a support structure.

ID	**Country**	**Background Description**
ES01	Estonia	Academic in University in fields related to Videogame Development.
ES02	Estonia	Responsible of a Videogame Organization in Estonia
ES03	Estonia	Academic in University in fields related to Videogame Development, game developer and volunteer in Game Jams events.
FI01	Finland	Game developer and volunteer in Game Jams events.
FI02	Finland	Academic in University in fields related to Videogame Development and game developer.
FI03	Finland	Responsible of a Videogame Organization in Finland, former game developer and studio owner.
NO01	Norway	Responsible of an Organization in Norway, Former game developer and studio owner.
NO02	Norway	Game developer and studio owner.
NO03	Norway	Game developer and studio owner.

LA01	Latvia	Game developer and studio owner.
LA02	Latvia	Game Student in Finland and Latvia.
LA03	Latvia	Game developer / studio owner and participant of Videogame Organization in Latvia

Table 9. Demographic of interviewees participating in the research. (Self-Elaboration).

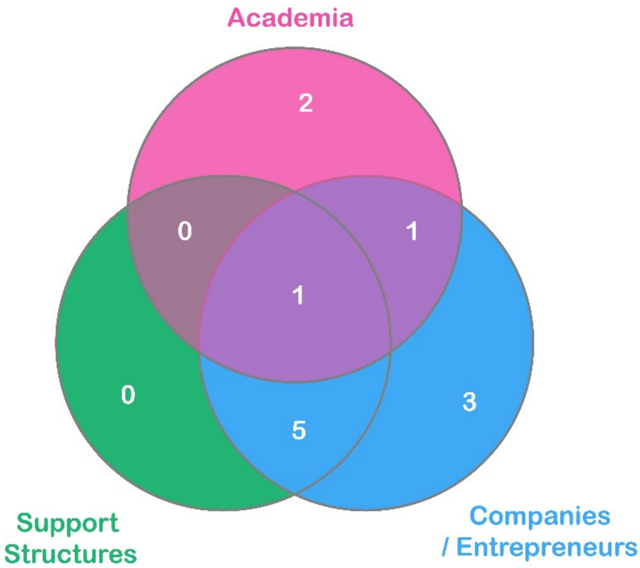

Figure 24. Number of Interviewees per Institution or Organization. (Self-Elaboration).

6.2 Data Collection

The study conducted 12 qualitative semi-structured interviews that offers the possibility to discuss particular themes yet facilitating space for the participants to direct the conversation to other sections that might not have surfaced in the literature review but are a testament of their personal experiences and perspectives (Galletta & Cross, 2013, p. 24). The interviews and were conducted in English via Microsoft Teams between November 2024 and January 2025 by the researcher.

A preliminary questionnaire was prepared and served as a main guideline for the interviews, with a listing of 24 questions that referred to the Main Research Question as well as the Support Questions and inquired the participants about specific details within each dimension.

It is important to mention that this was the first time that the researcher had used this methodology and after the first two interviews the researcher questioned her approach and felt that the answers were too rigid and lacked authenticity when facing the interview participants. A helpful resource for the researcher was the book Thematic Analysis by Braun and Clark (2021) which allowed a process of re-instating self-confidence and a better understanding of the process and method, allowing her to understand the particularities of this method to obtain rich data within the context of an interview. Other material that was particularly helpful to guide the researcher was the work by Galletta and Cross (2013, p. 75-77) which discuss about the importance of the reciprocal role of the researcher with the interviewee and the reflexive nature of the process.

After the first two interviews were conducted, the questionnaire was revisited and modified to have 28 questions. The first questionnaire was organized strictly around the main research question and supporting questions with a direct focus on identifying the challenges in different aspects of game development and following a structured format. The topics covered were initially an open question regarding what are the three biggest challenges that an indie game developer face in the country, public mechanisms available to support developers, the role of Academia and its interaction with the industry, the presence of support structures such as incubators, accelerators and mentorship programs, the presence of Publishers and specialized Investors in the country and the relevance of Events. The reviewed questionnaire included an introductory section which asked about the respondent's current role and their motivations towards videogame development, as well as a closing question asking, "If you have the power to change one thing in the current ecosystem, what would that be". The reason for this change was to understand better the perspective and experiences of the interviewee, helping give a solid ground to the data that would result from the interview. Is important to mention that some relevant topics that emerged during the interviews were also inquired in the following sessions to analyze the perspective of the participants, although it was not possible to include it on the previously completed ones. In Appendix 2 the revisited questionnaire is presented.

Due to the wide range of backgrounds, some of the interviewees didn't have specific information or experience about some topics for example they haven't participated in incubators programs or in other cases they didn't have experience applying to grants, therefore in these cases when the interviewee answered "I don't know" those aspects were not included in the Analysis.

6.3 Data Analysis

The automated transcription of the interviews was obtained through the software Microsoft Teams after each interview concluded, which resulted in 207 pages of transcripts. The transcriptions were reviewed individually against the video recordings to correct potential transcription errors, remove confidential information as well as remove repeated filler words in some of the sentences.

To preserve the anonymity of the participants, the names of the participants were replaced by two letter acronyms referring to each of the countries that a participant belonged to. The duration of the interviews was in average 52 minutes. Initially, each interview was transferred to a spreadsheet to start the coding process. This turned out to be particularly slow and time consuming, considering the length of each interview and the inflexibility that a spreadsheet provides. After raising these challenges to the Thesis Supervisor, it was suggested to try the software Atlas.ti for Qualitative Data Analysis. This software allows researchers to analyze interview transcripts by tagging and categorizing the data, visualizing relationships between the codes and facilitating identifying patterns. After an initial test with two of the transcriptions, Atlas.ti proved to be particularly helpful in the process of tagging interview segments, organizing and categorizing the codes. Although the software also offers AI capabilities utilizing a GPT model that helps code the documents (Atlas.ti, n.d.), the results of the segments tested lacked accuracy and connection, since it selected some words in the paragraphs and created codes that were irrelevant to the topic in discussion. Taking this into account, the process of code definition and consolidation was handled entirely by the Researcher and after several iterations and revisions 273 different codes were created.

The process of creating the themes was handled in the whiteboard platform Miro, after exporting all the codes from Atlas.ti and arranging them into Miro as digital “sticky notes” to group them in clusters. Figure 25 illustrates the clustering of codes and subcodes that would be classified under the Theme Mindset & Perceptions.

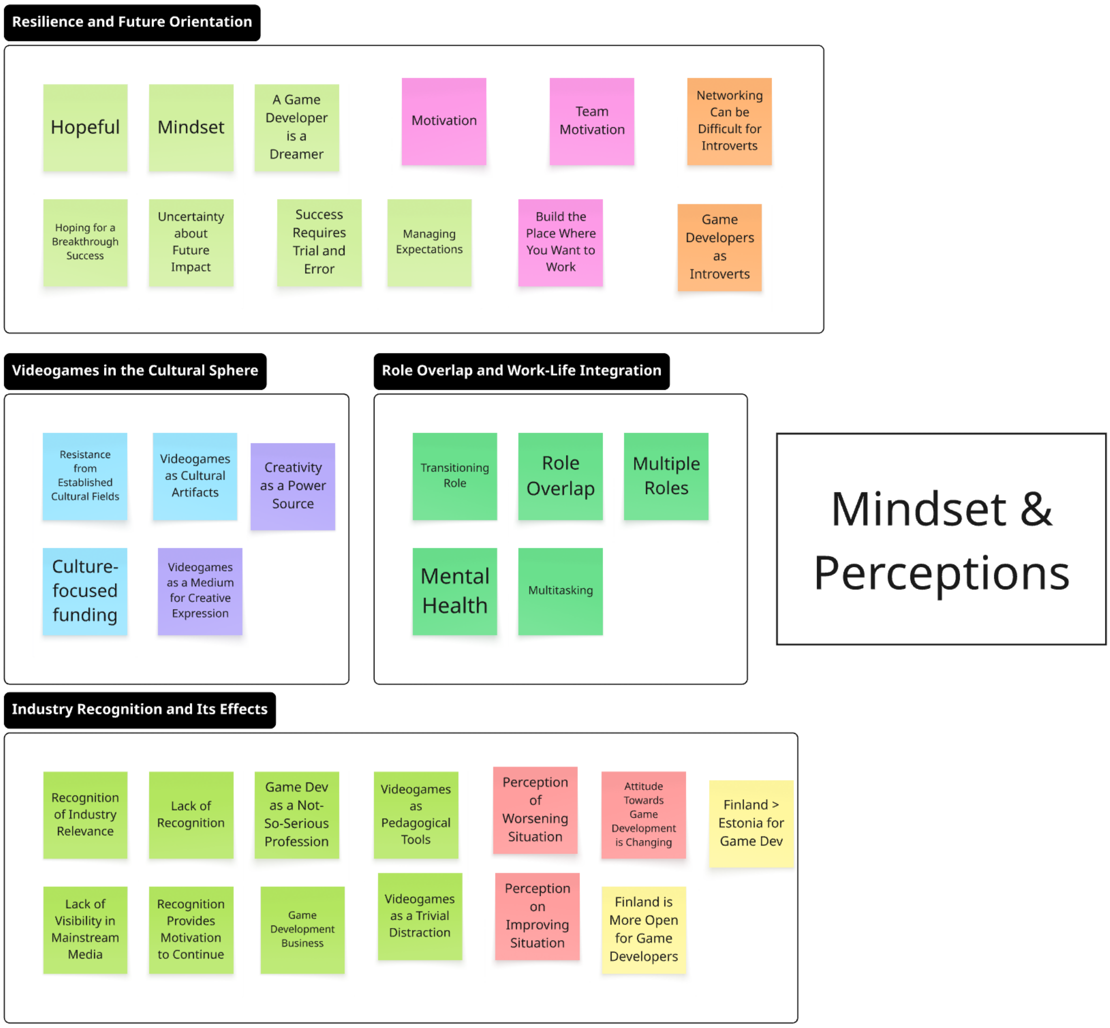

Figure 25. Clustering codes into Subthemes and Themes using a Digital Whiteboard. (Self-Elaboration).

These codes were further categorized and later integrated into seven themes with a corresponding subset of second order themes. The seven themes are *Financial Constraints and Funding Struggles, Governmental and Legal Barriers, Industry Landscape and Market Dynamics, Mindset and Perception, Networking and Ecosystem Engagement, Talent Pool Development and Specialization* and *Technological Approach and Challenges* and are showcased with their corresponding subthemes in the figure 26. In total, 273 codes are combined in 37 subthemes and 7 themes. It is relevant to mention that some codes have been aggregated into more than one theme, therefore the totalization of codes per theme, as shown on table 10 is 315 instead of 273.

To illustrate the frequency of the associated codes, a co-occurrence table is presented in table 10 which was obtained using the built-in functionality of Atlas.ti. In this case, all the themes identified are presented in the rows while the columns show the interviews grouped by country. The first numerical value next to the code represents the number of codes that are represented in that theme while the second corresponds to the number of citations of that theme. In this case, the theme *Financial Constraints and Funding Struggles* combine 92 different codes, and is cited 459 times being Finland the country that has more citations related to this theme (142), followed by Norway. This theme consists of 459 citations across the 4 countries, followed closely by *Talent Pool Development and Specialization* (344), and *Networking and Ecosystem Engagement* (252). Among the countries, Finland shows the highest number of total references (507), which reflects a more frequent thematic density while Latvia shows the fewest with 349. The theme with lowest density is *Technological Approach and Challenges* which features 24 references in the subset of Norway while in Estonia reaches 5 mentions.

			Estonia 3 262	Finland 3 298	Latvia 3 209	Norway 3 265	Totals
Financial Constraints and Funding Struggles	92	459	104	142	89	124	459
Governmental & Legal Barriers	19	122	34	32	26	30	122
Industry Landscape & Market Dynamics	42	224	38	61	72	53	224
Mindset & Perceptions	42	212	76	52	38	46	212
Networking & Ecosystem Engagement	36	252	67	90	43	52	252
Talent Pool Development and Specialization	67	344	73	120	70	81	344
Technological Approach & Challenges	17	50	5	10	11	24	50
Totals			397	507	349	410	1663

Table 10. Table of Co-Occurrence of the Themes per Country. (Self-Elaboration).

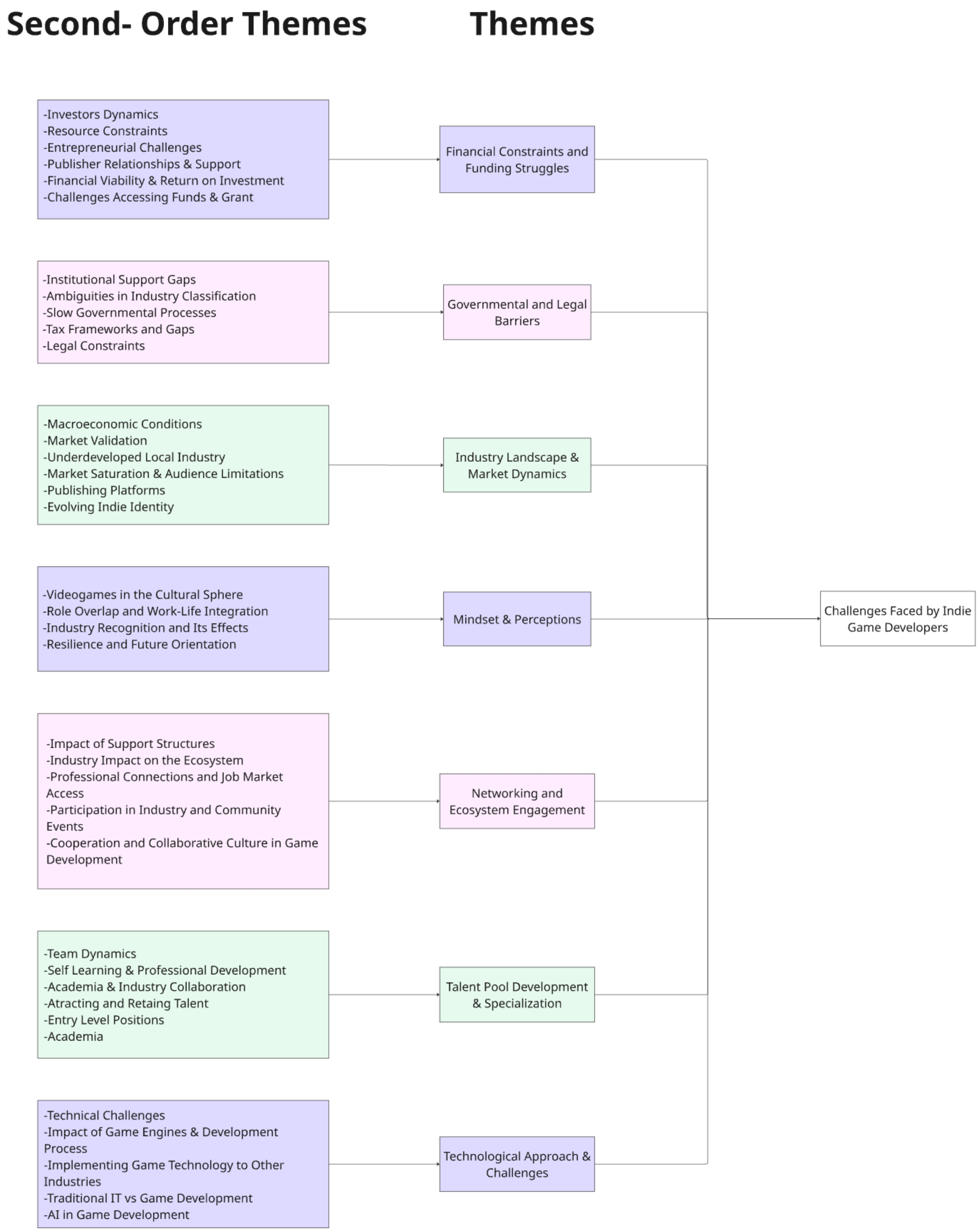

Figure 26. List of Themes and Subthemes identified from the interviews. (Self-Elaboration).

6.3.1 Empirical Results

In this section the findings of the research are presented, organized in four segments: multifaceted challenges, mechanisms for financial support, the role of support networks and a section with other relevant topics that emerged in the interviews.

Each interviewee was asked what are the most relevant challenges that indie game developers must overcome in their country. A wide range of aspects were raised by the interviewees, although the themes were relatively homogeneous across the different countries.

Five interviewees coincided in identifying the limitations of time and money with many developers having to juggle different jobs: a developer that wants to work on their own IP or project requires a second job to make ends meet.

> *“Many companies have actually changed their focus so previously when they had their own original titles and now they work more like subcontractors” (Interview ES01, 2024)*

> *“A lot of studios in Estonia to survive they were doing outsourcing work.[…] they were maybe making their own indie game but to sustain the business they were doing on the side, some kind of optimization or 3D models or some other projects” (Interview ES03, 2024)*

> “[…]*in terms of the funding opportunities, usually it is either self-financed. So people […] having it as a side hustle developing it in addition to their full time job or studies” (LA01, 2024)*

This multiplicity of roles creates an additional effort for the individuals who must balance different responsibilities and personal life.

> *“[…]we all three wish that one day we don't have to do anything else. We just can focus on games” (Interview ES03, 2024)*

> *“For the money thing, I don't think there is really much else than just to bootstrap […] Of course if they have some experience […]do outsourcing work so they get some money […] while also working on their own game” (Interview FI03, 2024)*

Latvian interviewees mentioned that the lack of public support mechanisms, such as grants or subsidies available for game developers, limits their ability to fund projects. In Finland and

Norway, although some Government grants are available, they may not cover all the necessary expenses for the development of a project and certain conditions for the use of the funds requiring many developers to bootstrap their projects. Some funds cannot be allocated to marketing, which leaves developers in a dire position when trying to help their products stand out on a saturated market.

> *“[..] when there's any business grants given, it can't be given to create an increased competition like one they can be competition between Norwegian companies. In a way, because that would end up skewing the business if some get and others don't. So you have to show how [..] what you're selling or who you're selling it to differs from the rest.” (Interview NO02, 2024)*

The overall market downfall plays a big role, impacting studios in Estonia. Many studios rely on outsourcing work to sustain their businesses, but several of these projects have been canceled after the post covid market downfall, which sent the industry in a downward spiral.

Four interviewees stated that an oversaturated market is a significant challenge for developers. Consumers have numerous entertainment options, and rising expectations for game quality make it increasingly difficult to stand out.

> *“Inflation is rising, but salaries are not, so people have less money to spend anyway on any kind of entertainment. So it is a very challenging market.” (Interview FI02, 2024).*

Other challenges mentioned are a shallow talent pool, particularly in Game Design, which impulse additional competition among organizations trying to attract skilled professionals. The interviewee NO01 mentioned that an outdated academic curricula coupled with a reluctancy to embrace new technologies delays even further the local industry.

Table 11 below summarizes the challenges pointed out by each of the participants arranged by country.

Research Question	Country	Main Challenges
What obstacles do independent video game developers encounter during the development process in the country?	Estonia	-Societal Mindset (ES01) -Post Covid Market Downfall (ES02) -Lack of Industry Recognition (ES01) -Lack of Funding and Time (ES03)
	Latvia	-Lack of Visibility in a Crowded Market (LA02, LA03) -Lack of Governmental Support (LA01) -Limited Events in the Region (LA01) -Shallow Talent Pool (LA01, LA03) -Finding Sponsors (LA02)
	Norway	-Adaptability to New Technologies (NO01) -Outdated Academic Curricula (NO01) -Ambitious Scope (NO02) -Limited Business Skills (NO02) -Lack of Funding and Time (NO03) -Lack of Visibility in a Crowded Market (NO03) -Lack of Culture of Success (NO03)
	Finland	-Lack of Funding and Time (FI01, FI02) -Lack of Visibility in a Crowded Market (FI01) -Technological Arms Race (FI01) -Finding Co-Founders (FI03) -Lack of Motivation (FI03)

Table 11. Challenges identified by participants arranged by country. (Self-Elaboration).

6.3.2 Funding Frustrations: From Self-Support to State Aid

Regarding the research question “What are the primary sources of funding for independent videogame developers in the country and what challenges do they face in securing investment?” the interviews revealed that in Estonia, videogames fall under the jurisdiction of the Ministry of Culture. However, the country's support and investment efforts are primarily directed toward IT companies and startups. Additionally, the emphasis on traditional creative industries like music and film further limits official support for an already small industry.

> *“Estonia is a startup country, so there are many tax incentives or support programs, projects, everything that is only tailored specifically for startups in IT” (Interview ES02, 2024).*

According to the interviewees, game development is not always considered on the same level as the music or film industry, which means the sector lacks participation in decision-making and cooperation with the government.

> *“[…]even though videogames are under the Ministry of Culture for a long time, [it] didn't want to do any business with videogames because they mostly considered videogames as a gambling.” (Interview ES02, 2024).*

Furthermore, Estonia uses its own adapted version of the European Classification of Economic Activities (NACE), known as EMTAK. This system includes a category for "Video Game Publishing" but excludes other aspects of game development. As a result, many organizations register their activities under "Software Development," leading to further misclassification and making it challenging to gather accurate industry statistics. One of the interviewees mentioned that this has led some online casino studios, also known as i-Gaming, to intentionally use different classifications to avoid higher taxes.

> *“[…]there is a new trend: gambling companies now put themselves under this code not to pay taxes and a lot of studios like gambling studios are doing that. So now, well, the government has to fight with all of them 1 by 1. And it's it's a long adventure up ahead […] they call themselves iGaming” (Interview ES02, 2024).*

A similar situation was voiced by Latvian interviewees, that refer the lack of visibility of some videogame companies that can only be identified after a manual effort is done by some of the local organizations such as Latvian Game Developer Association or Game Dev Estonia.

While there are government initiatives to provide some financial backing for game studios, support is often limited and not consistently available. There's a sentiment that governmental support for game development in Estonia is not as robust as in some neighboring countries like Finland (Interview ES02, 2024).

In Finland, there are local grants that developers can apply to when they are preparing a prototype or demo, such as Digi Demo. Interviewee FI02 particularly mentioned the positive support received by the organization when applying for the grant and the transparent feedback offered when a negative decision was made. In Finland loan schemes can also be tapped into to cover partially the financing expenses of a game development project, however these require the developers to have a warrantor and pay back the load. Such is the case of Business Finland, which was mentioned as one of the alternatives

> *“[…]It's a possibility for funding and you can get quite easily funding, but also like beware if you do cause it's actually a loan or this kind of thing you have to pay it back someway or another, part of it at least.” (Interview FI01, 2024).*

Norwegian developers tend to rely heavily on state support which is usually factored by the funds available for Cultural industries under the Norwegian Film Institute as well as Regional Funds. A high cost of living in Norway, adds pressure on independent developers trying to make a living from game development, cause additional complications when trying to sustain game development without external funding.

Publishers can also act as facilitators for the development and extending the reach of projects to other markets and platforms.

> *"Is the implementation of multiplayer for that project where they essentially hired an outside studio to handle the porting of the game and we definitely would not have been able to do that without them." (Interview LA01, 2024).*

However, some developers fear encountering predatory publishers that might compromise their vision and take away potential earnings.

Norwegian interviewee mentioned that the possibility of Crowdsourcing is a viable option for developers when they require to fund their projects, however in Finland there are legal limitations and restrictions when utilizing Crowdfunding strategies.

> *"Crowdsourcing is still a thing. […] That's where social media tends to identify genuine people who really care about their craft and really, really want to show it off and talk about it. […] if you're really, really true to your idea people are ready to actually support you on that level, but you also have be a kind of clever marketer." (Interview NO01, 2024).*

> *"[..]doing crowdfunding in Finland is very complex business." (Interview FI03, 2024).*

A relevant point mentioned regarding Norway is the vulnerability of many developers relying heavily on state funding, due to the limited number of private investors interested in the videogame industry.

> *"You know, they've become, not slaves of, but […] very dependent on the state to even survive, which is not healthy". (Interview NO03, 2024).*

> *"The downside of Norway is that […]now it's horrible in the investor environment […]here are so traditional and conventional that you only invest in the shit that they [know] well, the typical stuff […] salmon farming, fish farming, mining, oil and gas, you know the drill, the safe bets". (Interview NO01, 2024).*

6.3.3 Strength in Numbers: The Support Networks Behind Indie Game Development

In respect to the Research Question "What role do support systems such as incubators, accelerators, and mentorship programs play in the success of independent videogame developers in the country?" the interviewees referred experiences with several of these systems.

Academia plays a significative role in training, nurturing and support local talent but may struggle to keep up with the fast industry changes, indicating a need for better integration between educational institutions and the gaming industry. Several of the interviewees, participate as lecturers in universities and one interviewee studied completed a degree in Latvia and is completing a second degree in Finland, offering an opportunity to identify some difference between the countries.

> *"The biggest thing about Finland is I like the thing that XAMK is project based, so we are studying based on projects and it's only mainly its practice and in Latvia it's more about the theory and less about practical work." (Interview LA02, 2024).*

One of the academics interviewed pointed out that formal education is not required to succeed in the industry, while one developer referred to the need of specializing further his knowledge through a Master's Degree in Computer Science.

> *"Well in general I think that game designers and game makers don't need formal education at all because this is a rapid format of doing business then first thing what you need to have is some sort of integrated mindset." (Interview ES01, 2024).*

> *"[…]so I got into doing that [developing games] and I felt like I need a formal background, to work in in game development and programming so I got my Master's in Computer Science" (Interview LA01, 2024).*

One interviewee mentioned that the gaming sector benefits from leveraging academia's research and development potential, although several indicated that in their perception the main challenge of Academia is the limited talent pool with work experience in the field, thus the institutions require from their academics to have a master's degree or a Doctorate. To balance this, some institutions invite experts as lecturers in certain disciplines and recruit foreign talent, although this becomes challenging because the salaries offered are not competitive enough.

The interaction between Academia and the Industry are focused on experience sharing, identifying new research areas, and job opportunities for alumni. In Latvia, in particular the cooperation is reduced and the number of internships or entry level jobs is minimal due to the small size of the organizations that often times struggle with role overlapping and juggling multiple responsibilities.

> *"[…] for a small studio like ours I just don't want junior people. We are so few people that that for us, a Junior member would slow everything down other than make things better." (Interview LA03, 2024).*

Game Jams have proven to be a powerful initiative allowing developers to network with other enthusiasts, participating in practical projects and mediating into success for the participants, either introducing them to potential employers, publishers or directly evolving a Game Jam idea into a full and successful release.

> *"Our biggest success this year it was "Buckshot Roulette", a game made by one student. It's the most successful Game in Estonia of the year. It sold 1,400,000 copies, and originally that was a Game Jam project. So the guy was just going to Game Jams and he participated in three of them and then created this game. […] And it kind of went well and then now here's a multi-millionaire."* (Interview ES02, 2024).

> *[..]"there was the Nordic game jam and there was the "Baba is You". If you are familiar with that game, it was it started as a game jam game and now it's a successful release in Steam. […] So there are some key examples of what started as jam games but then turned out to be later developed into successful releases."* (Interview FI01, 2024).

> *"I know that one person who won our game jam was among the top, top three, I think. Actually got the job from the same company that was supporting us and we supported them by […] introducing students that are passionate about game development and I, as far as I know, that person, that one example is doing quite well.*" (Interview ES03, 2024).

The perception regarding Business Incubators and Accelerators is that their focus is inadequate, offering little real support for the aspiring developers. The primary concern voiced is that the main focal point is related to help developers familiarize themselves with the preparation of investment decks and pitches and connect with potential investors without offering actual funding. Except for Finland, these programs are oriented to startups in IT fields without an actual focus on videogame development. In the case of Estonia, previous programs specialized in videogame incubation are no longer active in the country:

> *"I would really want there to be an incubator that would understand games".* (Interview NO02, 2024).

> *"[…]some time ago we had another initiative that actually was under the Ministry of Economics and this was called 'Initiative from the Enterprise Estonia'. So they actually gave away some seed money for different kinds of startups, also including game studios but I think it's not anymore actively available" (Interview ES01, 2024).*

The interviewee ES02 however mentioned that a new initiative of a videogame incubator in Estonia is expected to start in 2025. Other type of mentorship programs that pair experienced industry professionals with indie developers to provide guidance on business planning, marketing, and other essential skills.

In addition, networking events provide a successful platform to showcase skills and projects, connect with peers, share knowledge, and collaborate. It can also be valuable to gather feedback for early concepts and prototypes and do market validation. However, the interviewees mentioned that the limited number of events in the Baltics makes it challenging for developers to showcase their work and find collaborators or publishers.

6.3.4 Other Relevant remarks

6.3.4.1 "If I Ruled the World…"

The participants were asked to respond freely "If you could change one thing in the country ecosystem to help Indie Game Developers succeed, what would that be?"

A selection of the answers is presented in this section, as well as other relevant points that were raised in the interviews.

“I would like to say that the Ministry of Economics should take care of gaming industry. So it's a business, of course it's also art and technology, it's like a inter-disciplinary thing, but first of all, it could belong into the business.” (Interview ES01, 2024).

“I would put videogame development to be considered on the same level as the music or film industry to have our own voice in the decision making” (Interview ES02, 2024).

“ […]the first kind of obvious one is additional government support programs for the industry. So either in the form of grants or as tax relief […] targeted towards this specific industry and the other one […] remove that fear of publishers from people because again, a lot or almost all the games that have been successful have been going through that route. So removing that fear from people would be quite, I think, quite powerful.” (Interview LA01, 2024).

“I would wish that the games industry would get support from the from the government on the commerce side and that our government would actually see it as a business and an industry on par with all the other industries in Norway that are supported. I think this is the key fight we're having.” (Interview NO03, 2024).

“Hire juniors. Because in order to people to make it in the business, we need more people starting of if we just hire the seniors, […] if we raise the enter barrier too high […] we will lose these people and they will go do other things. And then maybe they won't come back to games.” (Interview FI01, 2024).

“Basic income, everybody getting a block of money in the accounts every month is the best thing we can do for all kinds of creative industries.” (Interview FI03, 2024).

Other points are summarized in Table 12 grouping the answers by Country and indicating who was the interviewee that expressed that specific idea.

Research Question	Country	I would change...
If you could change one thing in the country ecosystem to help Indie Game Developers succeed, what would that be?	Estonia	-Ministry of Economics should take care of gaming industry. (ES01) -Establish video game development on the same level as the music or film industry to allow participation in the decision making (ES02) -Mantain and Improve the mechanisms already in place (ES03)
	Latvia	-Additional government support programs for the industry (LA01) - Remove the fear of Publishers (LA01) -Increase the number of Game Development Organizations (LA02) -Attract a AA or AAA game studio to the country (LA03)
	Norway	-Establish a Ministry of Technology to take care of gaming industry (NO01) -An incubator program specialized in Videogames (NO02) -A business focused approach for the industry from a governmental
	Finland	-Have more entry level positions, hire more juniors (FI01, FI02) -Basic Income to reduce income stress and allow experimentation(FI03)

Table 12. List of wishes that interviewees would like to change in their local ecosystem. (Self-Elaboration).

6.3.4.2 Societal Perception

The absence of a stable income in game development gives it an informal, hobby-like nature, which may explain why interviewee ES01 believes that the Estonian society perceives it as "not a real business" but rather a childish pursuit.

> *"I think the biggest challenge is the mindset. That making game is not a serious business." (Interview ES01, 2024).*

A similar perception might occur in Latvia, where LA02 mentioned the reticence from family members to study a second degree oriented to Videogame Development.

> *"If I am talking specifically about my family, they were skeptical about this idea, and sometimes there are some notes that, 'oh, at least you are in computer science' " (Interview LA02, 2024).*

This attitude can discourage young developers from pursuing game development as a career and rather focus on more traditional industries. However, this opinion is not shared by all interviewees. ES03, for example considers that the game development industry is gradually improving in the country. LA01 reflected that the tends to be a generational negative perception towards games by older generations.

6.3.4.3 Games as Cultural Artifacts

In Estonia, Latvia and Norway, videogames are handled under the corresponding Ministry of Culture, however in Estonia and Latvia traditionally established artistic fields, such as Music and Film, tend to reject the idea of including videogames under the same umbrella, as stated by ES01.

Interviewee ES02 also mentioned that game development is not always considered at the same level as the music or film industry, which means the sector lacks a unique voice in decision-making and cooperation with the government.

> *"Last year, there was a bit of a controversy in relation to the Culture Minister at the time she was sort of pushing games, as a piece, a relevant area of culture that needs to be well supported. And then she did get some backlash on that. […] to me, that was surprising because I felt that that was a settled debate." (Interview LA01, 2024).*

In Norway for example, the perception of Videogames as cultural pieces is fully embraced. Government support in Norway has allowed the creation of games focused on artistic vision and cultural impact, rather than solely on commercial success as per the comments of NO03. However, there's a balance in Norway between supporting commercial games and games with an artistic vision. According to the interviewee NO03, Norwegian games focus primarily on art and humanity, while Finnish games may be more commercially driven. A similar perspective is shared by the interviewees LA01 and NO02, who consider that the videogames in their respective countries have a heavy cultural background while lacking a business focus. A more commercial focus could help boost the weight of the industry and promote it even further, particularly among private investors.

> *"in Norway, games are just not seen as proper business. It's been respected more and more as a form of art. But for some reason they still don't understand that there is money to make." (Interview NO02, 2024).*

Nonetheless, a highly profitable industry such as the Finnish one, steers away from the artistic endeavor a subject which should be balanced carefully, as the interviewee FI03 mentions

> "People don't really understand games to be anything else than money making machines necessarily. […] But it is a complex topic because at the same time, a

game company that makes games wants to become sustainable in the financial sense." *(Interview FI03, 2024).*

6.3.4.4 Lobbying and Governmental Support

Lobbying is essential for the game industry to gain recognition as a legitimate cultural and economic force. This influence can translate into favorable policy decisions, funding opportunities, and a decision-making role. Actively lobbying the government becomes a strategy to push for financial support, as well as considering videogame development to be on the same level as the music or film industry. This includes establishing official entities that the government can engage with directly, as mentioned by ES02 and NO01.

Lobbying efforts are crucial for securing financial support, such as subsidies and grants, which are vital for the survival and growth of game development companies. Additionally, in Estonia, a key challenge has been the perception of videogames as being closely linked to gambling, hindering their access to resources and support as mentioned by ES02. Separating the two industries in the eyes of the government and providing a unique representation for the industry.

The interviewee LA01 mentioned that the current taxation policy can pose problems for the growth of game development in Latvia, also affecting the amount of available talent. Game developers can achieve better awareness of policy makers if they unite to act together, reaching greater awareness of themselves, which is a role that some organizations such as GameDev Estonia, Neogames in Finland and Latvian Game Developers Association are taking.

Some of the interviewees also mentioned a general positive perception of improvement regarding the collaboration in the countries with Governmental representatives, although the changes take time to be observed.

> *"[..]now the game makers think that they are taken seriously. They are somebody, they were invited to the government level. So maybe there's also some extra motivation for them to continue." (Interview ES01, 2024).*
>
> *"[…]the problem and challenge that we have in Norway, it's still a problem, but a little bit less because we've been noisy, but basically, no one took game development seriously." (Interview NO02, 2024).*

6.3.4.5 Impact of Generative Artificial Intelligence in Videogame Development

Although the topic of Generative Artificial Intelligence was not originally included in the interview guide, interviewee NO01 discussed about it as a tool to facilitate and speed up the development, considering that AI literacy has become a mandatory skill among new aspiring developers.

> *"[..]if I was to start off again to do my own company, I will only look for AI people who are very, very clever utilizing AI tools. That would be my first criteria. Can you prompt out a 2D image into a 3D object? I will use programmers who are clever in using copilot or using programming tools to help sharpen up their code. At same time, they're good at understanding how game code works and how to structure them. But you know I will want them to also speed up their process.*
>
> *Don't tell me that is going to take me two days to get this character to jump. Please prompt it out and figure it out and apply that ASAP." (Interview NO01, 2024).*

Most of the interviewees were already completed, therefore it was not possible to ask all the other participants about their opinions, however, NO02 mentioned that remains skeptical regarding using AI for videogame development. Although the interviewee acknowledges the growing relevance of AI tools, particularly for automating repetitive tasks or supporting smaller teams, also highlights ethical concerns od AI-generated content, especially when it might involve using existing work without consent. It was also raised a general worry about how AI will impact the job market, particularly in the already struggling game developing industry.

7 Discussion / Conclusions

The concept of indie game development is often elusive, with researchers and authors describing it in varying, sometimes contrasting, ways. For some authors, like Garda & Grabarczyk (2016) "being indie" can imply an intrinsic creative and financial freedom even meaning the disconnection from any relationship with publishers, in a way, belonging to a counterculture that stands in opposition to the mainstream—represented in this context by AAA games and the large corporations behind them. Others, such as Browne (2015), describe indie development as inherently rebellious, metaphorically associating its origins with the post-punk movement and providing it with a rebellious and offbeat nature akin to cultural misfits.

The term indie game developer refers specifically to individuals and organizations that design and publish videogames independently, without financial or strategic backing from mid-sized or major publishers. To distinguish them from hobbyists, this definition includes the condition that their final product has commercial potential and can reasonably be brought to market.

The literature review highlights the significant scale of the global videogame market, estimated by 2023 at 166.9 billion euros worldwide and with an expansive player base, totaling 3,381 million players (Newzoo, 2024, p. 21). These factors make the industry an attractive and fast-growing sector across all regions. Moreover, the scalability of digital game products further enhances their appeal.

In Europe, strengthening competitiveness in this market has become a key objective, especially given the dominance of Asian and American developers. By 2023, only 18.33 percent of the global market was held by European developers (Newzoo, 2024, p. 21). Within the Nordic-Baltic region, the game industry presents a tangible opportunity to boost local economies, generate tax revenue, and create new employment opportunities. For example, in Finland, the industry contributed approximately €3.2 billion in 2021 (Hiltunen et al., 2023, p. 48).

The aim of this study is to analyze what are the most important challenges that indie game developers face in each of the countries and to highlight the role of the entrepreneurial ecosystem, along with the interplay between academia, industry, and government, in shaping the success of these developers in the region. The research questions have been answered based on the empirical study described in Chapter three and this section presents the conclusions and analysis of the results obtained.

7.1 Key Findings

From the interviews it was possible to identify as the main recurring obstacle the difficulty of securing adequate funding to support the development. In many cases, developers must rely on self-funding for prolonged periods of time, often agreeing to participate without guaranteed compensation and managing multiple jobs or side occupations to make ends meet. This factor constitutes an additional stressor for the developers and has a detrimental impact on their mental and physical well-being. Despite the existence of some programs in Finland and Norway that provide access to grants, these result insufficient to cover all the expenses generated by a development process that can expand over several years. To overcome this, the developers interviewed raised the importance of limiting the scope of the project. Regular communication with the audience was also highlighted as a key strategy for validating ideas and integrating user feedback throughout the development process.

The importance of mentorship programs, and networking opportunities is evident across the regions. Given the relatively small populations of the countries studied and the limited availability of a specialized workforce, finding suitable co-founders remains a significant challenge for many developers. This scarcity often limits the formation of teams with relevant skills and experience, which are essential for game development. There is a pressing need to consolidate networking and impulse connections within the local industry. Initiatives that encourage collaboration, such as industry events, mentorship programs, and online communities that, reflecting the strength of Communities of Practice, can reinforce knowledge sharing while offering a support network. Additionally, creating more opportunities for internships and entry-level positions can help integrate emerging talent into the ecosystem, ensuring a sustainable pipeline of skilled professionals and potential co-founders in the long term. The presence of a strong community, opportunities for collaboration, and knowledge sharing are crucial for independent developers.

The effectiveness and availability of the incubators and accelerator programs vary from one country to another. While Finland offers well-established support structures, other countries provide limited or generalized programs that may not adequately address the unique needs of game developers, which limits their ability to provide relevant guidance, mentorship, and resources. Game development involves distinct production cycles, distribution challenges, and audience dynamics that differ greatly from other tech or creative sectors. As such, for these initiatives to be truly beneficial, they must be designed with a deep understanding of the videogame ecosystem. Specialized programs can offer more targeted support, from navigating publishing relationships to understanding platform requirements and engaging with player communities. Enhancing the specificity and accessibility of these programs would greatly contribute to the growth and sustainability of the local game development scene. The interviewees FI02 and NO03 mention that the lack of accelerators and support for scale up organizations proves to be a limiting factor for the growth of the sector.

The type of support required by game developers greatly depends on the specific phase of their development journey. Solo developers often face challenges related to isolation, limited resources, and the need to acquire a wide range of skills across disciplines. At this stage, access to mentorship, early-stage funding, and networking opportunities can be crucial. Small teams, on the other hand, may benefit more from targeted business development support, guidance in project management, and assistance with visibility and marketing strategies and reaching to publishers. As teams grow and begin to scale up, their needs evolve further requiring support in areas such as team structuring, long-term financial planning, international market access, and investor relations. Recognizing that each stage brings its own set of challenges and priorities is essential for designing support systems, whether through public policy, industry programs, or educational initiatives that are truly responsive and effective. Figure 27 summarizes the needs that each group presents in regards of their own characteristics.

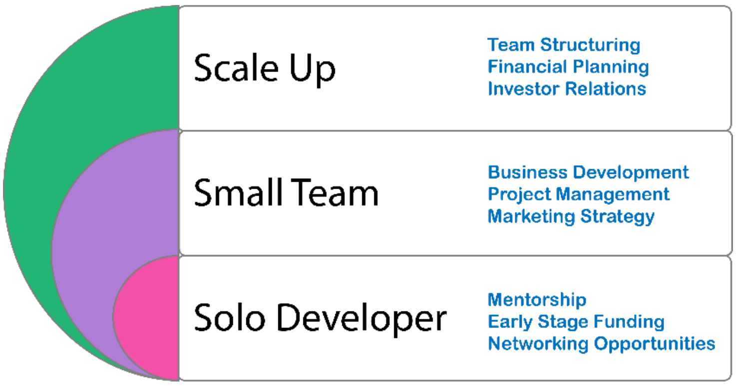

Figure 27. The needs of indie development teams in respect to their structure. (Self-Elaboration).

In Finland, for example, some public mechanisms such as Business Finland are available, and are perceived as a positive reference to replicate in their own countries by the interviewees from Estonia and Norway. However, this program is not accessible to individuals and in some cases the repayment of the loan can hinder the financial stability of the entrepreneurs as mentioned by the interviewees FI02 and FI03. It is crucial to warranty that there are support mechanisms across all the levels of maturity of the organizations and that the developers and companies can access these resources openly.

The work does not conclude with the release of the game; increasing the game's visibility emerges as a significant task, particularly concerning budget constraints and the marketing skills required to promote a product in an already saturated market. This challenge is even more pronounced for developers who are not affiliated with a publisher. While publishers play a crucial role in supporting game promotion, several interviewees appeared hesitant to seek publisher partnerships for their completed projects, often without being able to clearly articulate the reasons behind their reluctance. However, one interviewee (LA03) highlighted that finding the right publisher can significantly enhance a project's chances of success. At the same time, they observed that many developers are wary of "predatory publishers," fearing that such partnerships might compromise their creative independence. This approach is similar to what is described by Crogan (2018, p. 17) when discussing about the counterculture of being indie and how the developers must constantly endure external pressure without succumbing to the “commercial mainstream”.

However, the role of a publisher should not be equated solely with a controlling entity. Instead, publishers should be deemed as partners who can provide valuable support and help expand a project's reach to new audiences and markets, without compromising the integrity or vision of the product. Therefore, it is essential that developers approach the selection of a publisher with careful consideration, ensuring that the terms of the agreement align with the team’s goals and values. This is reflected in the words of NO03, that mentioned the long process the team sustained when selecting the right publisher for their most recent game. In some cases, NDA and legal agreements precludes developers to speak openly about the terms of the contracts they engage, and this only benefits predatory publishers that can take advantage of the more unexperienced developers. In these cases, specialized and accessible legal support can be crucial for the decision-making process (Josef et al., 2022, p. 166-168)

Game developers often face challenges related to business skills, marketing knowledge, and understanding the global market. Strengthening these abilities could be managed from the academical perspective, offering basic business management courses as stated by NO02. However, not all the developers start their journey within the classroom, and it is frequently perceived that formal education is not a requirement for being a game developer, as referred by ES01. In traditional studios these tasks related to business management are commonly handled by one or more producers with a set of skills and knowledge that allows them to cover the needs of the organization and coordinate through third parties whenever specialized support is required. However, among indie studios, the role of producers is rare.

The authors Whitson et al. (2021) present compelling arguments regarding the role of the producers in the indie ecosystem: in the pursuit of a more personal relationship with the art and craft, a more egalitarian and horizontal structure is established with the core development team defined in the triad of programmer, artist and designer, and in some cases even embedded in a single individual. This minimal team, now voluntarily stripped away from a producer, has then to assume the responsibilities related to marketing, human resources and networking and struggling to handle the production processes, taking over extensive and unsustainable workloads and in many cases failing to achieve their original goals. It is perhaps the own role of the researcher of this study as producer that makes evident that this could be one of the principal issues that smaller teams face. The task could be given then to support mechanisms to help train producers and allow the indie developers to understand the relevance of the role and the impact on the team's success.

Gaining recognition for videogames as a legitimate cultural product and a profitable business denotes a complex obstacle for developers, because it requires a shift in the societal perception that can only be promoted but ultimately is out of their control. The studied countries have demonstrated a different perception regarding videogames: while in Norway they are perceived as cultural artifacts and receive support by the Ministry of Culture and the Norwegian Film Institute, however in Latvia and Estonia the situation is contrasting. However, being part of the cultural identity is not a panacea. Norwegian interviewees NO01 and NO03 denoted that the relegation of games as only cultural artifacts ousts them of profitability opportunities and hinders the opportunity of growth.

Authors such as Rasmussen et al. (2018) have studied in depth the impact of the interest groups in policy changes. One significative focus should be given to the analysis of the current perception of the videogame industry, and discuss mechanisms to help shift to a more positive tone. However this process is slow and can be easily affected by the shifts of the ruling party. The interviewee LA01 for example, referred that the personal interest of the Minister of Culture in Latvia was publicly criticized in the media. However the role of Academia cannot be dismissed: by steering away the focus from the negative perspectives to positive applications, supporting and encouraging students and enthusiasts to actively participate in research and bring the media attention to the benefits of game development.

Among the studied countries, only Finland hosts several AAA studios actively engaged in the local game development ecosystem. In contrast, countries like Norway, Latvia, and Estonia are characterized by ecosystems composed almost entirely of individuals and small development teams. Although Finland has a long history of relevant government support for game development, Norway also benefits from good state funding compared to Latvia or Estonia, yet there's a concern that the industry becomes too dependent on this funding (NO03) and lacks the support of the private sector. These differences are somewhat reflected in disengaged actors, perceived as isolated and not connecting with each other. This is where the power of the "Communities of Practices" can be more beneficial and serve as a cornerstone for a Fellowship that would consider the particularities of each region, yet would seek after the shared knowledge and common benefits.

Success is a concept that varies in definition depending on the perspective of the individual: for some, success is encapsulated in the game reaching a sales target, while others would define success as being recognized in award ceremonies. It is precisely this personal definition of success that developers should begin to reflect upon: this individualized understanding of success should serve as a guiding framework, helping developers make informed decisions when selecting partners, applying to incubator programs, and directing their efforts in ways that align more meaningfully with their long-term goals and core values.

7.2 Recommendations

The myriads of challenges that indie game developers face in the Nordic Baltic countries might seem overwhelming, and the efforts that the NoBaN network would implement can be easily lessened if not handled with diligence and in coordination with each other. Some recommendations to evaluate are presented in this section, which might require consideration and assessment regarding the scope.

1. Comprehensive map of Resources available

As a starting step to align the efforts across the board a map of the different resources available in the region is required, including financial resources such as grants and loan schemes available for the local developers and their requirements. It is important to identify which mechanisms are available for single developers versus those that require a registered company. In a similar way, identifying mentorship and educational programs will provide specific guidance to independent developers and improve the chances of success in both local and international markets. This will also allow to identify the current gaps and blind spots in the ecosystem.

2. Strengthening Funding Structures Tailored to Indie Developers

It is evident that are required funding mechanisms for indie developers, in particular programs accessible for early stage teams and individuals. One focus could be encouraging sponsorship opportunities from established organizations as micro grant programs to support prototypes and proof of concept phases, also facilitating the use of some funds to marketing efforts and distribution

3. Communication and cooperation channels beyond Academia

The initiative of NoBaN Network represents a steppingstone in the procuring of a solidified industry across the region, however the cooperation should involve other actors in addition to the Academic institutions, stimulating the participation of industry representatives and government authorities alike to discuss common issues and draft initiatives to alleviate them. Only active participation among all stakeholders can facilitate real solutions to impulse the industry. A Nordic-Baltic Indie Fellowship initiative would help promote cross-border mentorship, skill sharing, and collaboration.

4. Develop Specialized Incubators and Accelerators for Game Development

Generic startup incubators often lack the domain expertise needed by game developers. Considering the experiences in Finland, promote the establishment of incubators and accelerators with specific focus in the industry. Ideally these programs should be codesigned with input from active members of the game community to reflect the realities of game production cycles and offering mentorship regarding development, publishing, monetization strategies, user acquisition, industry specific legal and business consultation. However these should encourage developers to articulate their personal success goals to help them align their strategies with their personal values instead of external expectations.

5. Support the emergence of Producers in Indie Teams

Institutions should recognize the need for producers as a core component of sustainable indie development, especially for scaling teams. One way to impulse it is by introducing training programs and mentorship opportunities focused on the producer role in indie studios, covering topics such as project management, budgeting and business planning, marketing and publisher relations.

6. Promote Legal and Contractual Literacy

Establish accessible legal support channels to help indie developers have a better understanding of publishing agreements, IP rights, NDAs and investment contracts. This could be achieved through legal clinics for game developers or partnerships with universities and legal firms, helping prevent exploitative practices and enhancing negotiation power.

7. Recognize Games as Both Cultural and Economic Drivers

Promote the collaboration between ministries of culture, education, and economic development to create a more supportive policy environment and actively pursue the acknowledgement of the artistic, educational, and economic value of games. Encourage students to pursue research aimed to raise public awareness about the positive impacts of game development and in innovation, digital literacy, youth employment might help shift the focus of the media to more positive outcomes.

7.3 Some recent updates in the Ecosystem

The process of research is slow paced and usually some updates are known before the study is complete. The final sections of this study were being written by April 2025, and by then several new initiatives were made public in the countries studied. Among the updates, in Estonia the organization Game Dev Estonia established a Pre-Incubation program alongside Tallinna Ettevõtlusinkubaatorid oriented to give support to aspiring game developers offering in person training and mentorship sessions that involved topics such as game design, project management and marketing strategies (Tallinna Ettevõtlusinkubaatorid, 2025). In Finland, Metacore Games launched a six months full time internship program called Press Play that would allow students and entry level candidates to apply to a paid internship within the company (Metacore, n.d.). Another relevant Finnish company, Supercell launched a paid 16-week program called “Spark” which is oriented for both individuals and teams to work in a project and potentially be hired a the end of the process (Supercell, n.d.-b). Additionally, Remedy is supporting the initiative “The Rookie Awards 2025” by providing two mentorship slots in a four week virtual sessions focused on Environmental Art (The Rookies, n.d.). Regarding financial support, IGDA Finland is offering a

10,000 Euros grant to registered companies with a vertical slice or demo available alongside mentorship and marketing support (IGDA, n.d.-a).

7.4 Reliability and Validity of the Research

A fundamental aspect to address when presenting research findings is to discuss the quality of the data, the suitability of the methods used and how accurately these elements represent the reality of the problem (Adams et al., 2014, p. 245). In quantitative research, the concept of reliability refers to the replicability of the results while the validity represents the accuracy of the results (Golafshani, 2015). Although the approach and implementation differ due to the distinct nature of the data and methods, the same level of diligence should be applied in both quantitative and qualitative research. Diverse opinions are drawn in the literature, from preserving the same terminology used in quantitative studies (Long & Johnson, 2000) to entirely replace them with new concepts such as *consistency, neutrality*, *truth value,* and *applicability* as described by Noble and Smith (2015).

These last authors, drawing on the work of Lincoln and Guba (1985) reframe the concept of Reliability as *consistency* and *neutrality* which emphasize that the research process should be traceable and replicable by others: although the researcher's position may influence the study, it is essential that the participants' voices remain distinguishable from the researcher's interpretations. Validity is then reinterpreted as *truth value* and acknowledges the existence of multiple realities. It also recognizes that the researcher's perspective may introduce bias yet aims to clearly and accurately present participants' viewpoints. Finally, *applicability* in qualitative research reflects the extent to which findings can be transferred to other contexts, mirroring the idea of generalization in quantitative research. Table 13 contrasts the terminology used in quantitative research and the alternate version in qualitative research.

Based on this, Noble and Smith (2015) present a collection of strategies that can be implemented to warrant the trustworthiness of the results in quantitative research. The factors that apply to the present study are described as follows.

Regarding the aspect of truth value, twelve participants from four different countries were interviewed, each of them contributing to one or multiple sectors within the indie game development ecosystem. The researcher only knew personally two of them before the interviews and besides having a general understanding of their current roles, was unaware of their personal perspectives in regards of indie game development and the state of the industry, therefore it wouldn't be possible to predict their observations.

Quantitative Research Terminology	Alternative Terminology Associated with credibility of Qualitative Research	
Validity: The precision in which the findings accurately reflect the data.	Truth Value	- Recognises that multiple realities exist. - The researchers' outline personal experiences and viewpoints that may have resulted in methodological bias. - Clearly and accurately presents participants' perspectives.
Reliability: The consistency of the analytical procedures, including accounting for personal and research method biases that may have influenced the findings.	Consistency	-Relates to the 'trustworthiness' by which the methods have been undertaken and is dependent on the researcher maintaining a 'decision-trail' -The researcher's decisions are clear and transparent. -Ultimately an independent researcher should be able to arrive at similar or comparable findings.
	Neutrality / Confirmability	-Achieved when truth value, consistency and applicability have been addressed. -Engagement with participants and methods are linked to the researcher's philosophical position, experiences and perspectives. -These should be accounted for and differentiated from participant's accounts.
Generalisability: The transferability of the findings to other settings and applicability in other contexts.	Applicability	-Consideration whether findings can be applied to other contexts, settings or groups.

Table 13. Differences in terminology used to evaluate credibility if research findings. (Adapted from Noble and Smith, 2015).

The diversity of backgrounds, experiences and roles provided a varied sample which allowed to voice different perspectives and find common ground among the opinions of the individuals contributing to the field of Game Development and captures a more comprehensive view of the current landscape. Such diversity enriches the analysis by highlighting common challenges, emerging trends, and unique opportunities specific to the Nordic Baltic context.

The interviews were recorded, and although the transcriptions were automatically handled by the software Microsoft Teams, the researcher did a manual revision on all the recordings to validate that the transcriptions were accurate and correct potential errors made by the software. These recordings were later revisited during the coding process alongside the handwritten notes that the researcher took during the interviews. When presenting the results, unaltered excerpts were included helping illustrate the perspectives as offered by the participants.

In respect of consistency and neutrality, the research process has been described in detail including the limitations and decisions made. A resource that was implemented early on the process and that quickly shown its value was the research journal which helped to gather thoughts and ideas, especially after the interviews, and was constantly revisited during the coding and analysis phase. This also served the purpose of retracing the process and allowed the researcher to have a more vivid recollection of the steps taken during the study.

Since this process was handled by a single researcher, it was not possible to rely on peer coding or conclusion building to minimize the potential bias. All the original recordings, redacted transcriptions and coded material are kept by the researcher and could be analyzed by other investigators if required. Regarding the applicability of the study, although the context of the Nordic Baltic Network is particular to the four countries that form part of it, the context provided allows to assess if the findings and can be extrapolated to other regions and communities to benefit from the conclusions of the research. In that regard, it is considered that the current research complies with strategies that support its credibility.

7.5 Benefit for the Author and Society

The development of this project has been a meaningful journey for the researcher, both personally and academically. This process facilitated in depth research of a topic that is considered vital to the videogame industry such as Indie Game Development. Engaging with a wide range of sources and scholarly articles was crucial in forming an informed perspective, and the process of reflection through extensive notetaking and revisiting the research journal, allowed the researcher to refine and deepen their understanding over time.

One of the most rewarding aspects of this journey was the opportunity to interview renowned developers and academics from different backgrounds and hear directly about their experiences representing a privilege and it is the researcher’s hope that this work honors their contributions and serves as a valuable resource for future researchers and general readers alike.

Conducting a Thematic Analysis of the interviews presented a significant challenge, as it was the researcher’s first time applying this method. However, the guidance of the Thesis Supervisor as well as the support from peers embarked on similar projects helped guide the process and acquire the necessary skills to complete it satisfactorily.

7.6 Research Limitations and Further Research

One of the main limitations in this study has been the restricted timeframe established by the structure of a Master’s degree, alongside the complexity of investigating a topic that spans four different countries. The process, which began in May 2024 with the topic refinement and the development of the Literature Review revealed different variables and inflection points that affect the developers in each of the countries.

The original methodology was designed as a mixed-methods approach. It proposed a first phase consisting of interviews to inform the Qualitative segment, followed by a Quantitative phase involving a survey to corroborate and triangulate findings. However, due to time constraints, the research was redefined as a purely Qualitative Study, culminating in practical recommendations for relevant stakeholders.

Although the current set of interviews is considerably varied, the study could have benefited from having the perspective of government authorities as well as publishers or investors. Including these voices would have provided a more comprehensive understanding of the broader ecosystem and its challenges.

As a practical output of this research, a workshop was planned involving members of the NoBaN Network. Its purpose was to present the research findings, draw country-specific conclusions, and collaboratively draft an Action Plan aimed at addressing identified challenges. While this workshop could not be carried out within the project’s timeframe, it is presented here as a key recommendation for future engagement.

The workshop is designed to have a duration of 2,5 hours and although it is recommended to be held in person, can also be facilitated online. During the session, participants would be introduced to the study’s findings and then divided into four breakout groups, each representing a different country. Group assignments can be randomized using Microsoft Teams to ensure balanced and unbiased participation. Each group should be given access to an online collaborative whiteboard platform such as Miro or similar.

Participants, now divided into country-specific groups, can begin engaging in focused discussions and idea-sharing related to their assigned context. The workshop includes three core group activities. In the first activity, groups are asked to review a list of challenges identified during the interviews and assign priorities to them. They are also invited to choose one of the three goals most frequently mentioned by interviewees as being a crucial step toward improving their local ecosystem. For the second activity, participants are randomly reassigned into new groups and tasked with creating a Root Cause Diagram based on the top three challenges selected earlier. This exercise helps uncover underlying factors and patterns contributing to the issues. Each group is then asked to identify the three root causes they believed accounted for 80% of the problem's impact, which they mark as key targets on their whiteboard. In the final activity, following a third reshuffling of the groups, participants are asked to collaboratively draft an initial Action Plan aimed at addressing those high-impact causes.

The workshop is not only a participatory exercise but also a platform for regional collaboration and mutual understanding among stakeholders. By encouraging dialogue and problem-solving across country contexts, it holds the potential to foster regional strategies, shared learning, and long-term partnerships. Its flexible format makes it adaptable for future replication in other regions or expanded with additional stakeholder categories such as policymakers or educational institutions.

Future research could expand on this study by implementing the proposed survey gathering valuable quantitative data to complement and strengthen the qualitative insights presented here. Comparative studies across additional countries or regions would also be valuable in identifying patterns and divergences that could inform both academic analysis and industry policy.

The following tools with components of Artificial Intelligence have been used in the elaboration of this Thesis. Their usage has been limited to the supportive role indicated.

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Appendix 1: Interview Guide

General Challenges:

Can you describe the biggest challenges you face as an independent videogame developer in the your country?

What specific obstacles do you encounter in different stages of game development, such as concept creation, design, production, and marketing?

Financial and Resource Constraints:

How do funding and resource limitations impact your ability to develop successful games?

What strategies do you use to overcome these financial challenges?

Technical and Creative Challenges:

What are the key technical challenges you face during game development?

How do creative constraints (e.g., limited team size, skills) affect your game development process?

Market and Competition:

How do you perceive the competition in the videogame industry in your country?

What are the main challenges you face in bringing your game to market and achieving commercial success?

Support Research Question 1

Interaction with Academia:

Have you collaborated with universities or academic institutions during your game development process? If so, what challenges did you encounter?

In your opinion, how could academic institutions better support independent game developers?

Industry Relationships:

What challenges do you face in building relationships with industry partners, such as publishers, technology providers, or other developers?

Can you provide examples of any industry collaborations that were beneficial or challenging for your development process?

Government Support:

How have government policies or programs impacted your ability to develop and market your games?

What challenges do you face in accessing government support or funding for game development?

Triple Helix Interaction:

How do you perceive the interaction between academia, industry, and government in your country?

What are the barriers to effective collaboration between these sectors that you have experienced?

Support Research Question 2

Entrepreneurial Ecosystem:

What challenges do you encounter in navigating the entrepreneurial ecosystem in your country?

How do factors like access to funding, mentorship, networking, and incubators affect your development process?

Access to Resources:

What resources (financial, technical, or human) do you find most difficult to access as an independent developer?

How does the availability (or lack) of resources in your country impact your ability to bring a game to market?

Market Entry and Success:

What challenges have you faced in entering and succeeding in the market?

How do you identify and connect with your target audience, and what barriers do you encounter in this process?

Support Structures:

What kind of support structures (e.g., accelerators, incubators, government programs) are available to you, and how effective do you find them?

What improvements could be made to the entrepreneurial ecosystem to better support independent developers like yourself?

Appendix 2: Introduction Message to Interviewees

Request of Interview for Master Thesis Research - Indie Game Industry in Norway

Rodriguez Castañeda Irislis MGBE23S
To: [redacted]

Reply | Reply all | Forward

Mon 12/16/2024 3:18 PM

Hello [redacted]

My name is Iris Rodriguez and I am a student of Game Business Management at KAMK in Finland. I am currently working on my Master's Degree Thesis focused on Indie Game Developers across Baltic countries and the challenges they face when they are developing their projects. I received your contact through my Thesis Supervisor Tanja Korhonen.

It would be invaluable to have the opportunity to interview you for my thesis and ask you a few questions about the current state of the industry and what aspects should be considered to impulse further development.

Would you be willing to participate in the interview? It is estimated in about 45 minutes and the participation is voluntary and anonymous.

This week I have the following slots available, but I can also accommodate to your availability or plan a session after the holidays.

Tuesday December 17th 16.00
Tuesday December 17th 17.00

Wednesday December 18th 15.00
Wednesday December 18th 16.00
Wednesday December 18th 17.00

Thursday December 19th 17.00
Thursday December 19th 18.00

Thanks in advance for your help and support on this research!

Best Regards

Iris Rodriguez
+358 [redacted]

Appendix 3: Declaration of Consent for the Collection and processing of personal data

KAMK • University of Applied Sciences

Declaration of consent for the collection and processing of personal data for scientific purposes

1. The research is developed by Irislis Rodriguez under the supervision of Professor Tanja Korhonen from Kajaani University of Applied Sciences (Finland) as part of the Master's Thesis program. The purpose of the work is to investigate the situation of the video game development ecosystem in the Baltic countries.
2. Participation in this study is entirely voluntary, and you may withdraw at any time by notifying the researcher. If you withdraw after data collection has begun, your data may still be used in anonymized form for research purposes. Anonymized data will not be deleted once collected.
3. During the interview, you will be asked questions about the video game development ecosystem in your country. The interview will be conducted via Microsoft Teams, and your responses will be recorded for transcription. By agreeing to the recording, you also consent to using Microsoft Teams' automated transcription tool.
4. Personal data will be stored separately from the recordings/transcripts and will only be accessible to the author
5. You will be provided with the transcribed information for your revision via email. The transcribed data will not contain your name or contact information and any mention of your name in the transcribed documents will be replaced with an alpha-numeric code.
6. The researcher will validate the transcription, and no one else will have access to the video recordings. The thesis supervisor will have access only to the anonymized transcripts.
7. Personal contact data will be stored separately from the recordings/transcripts and are only accessible to the author
8. Data storage details:

   Video recordings: Stored for 6 months.

   Transcripts: Stored for 2 years.

9. Personal data that will be collected: Name; Email; Video recordings. Personal data that will be published in the final document open to the public: Opinions and perspectives.

Contact details of the responsible person: Irislis Rodriguez
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I agree to be interviewed within the process of the mentioned Master's thesis. I acknowledge receiving information, read and understood it. I confirm that I was allowed to ask questions.
I hereby consent to the processing of my data collected as described in the form of original recordings of the interview and its transcription by the author of the Thesis for scientific purposes.

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Name Interviewee

____

Date / Signature