Towards a History of Finnish and Swedish Game Industry Platforms

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ABSTRACT

This paper looks at the history of game industry platforms in Finland and Sweden between 1979 and 2020 via 745 games. Both are relatively small countries where developers perform exceptionally well in a global market context. Developers and games developed in both countries are rather similar with some notable differences: Finnish developers focused on mobile games on Symbian in the 2000s, whereas Swedish developers focused on PC and console games, continuing a PC focus during the 2010s. The number of game companies has increased rapidly in Finland and Sweden since 2010 but peaked in Finland in 2014. From a platform studies perspective our data highlights rewarding historical insights about the dynamics of game industry platforms in Finland and Sweden with dimensions such as influence by demo scene, price of hardware/software (computers), mathematics education, third-party game engines, and finally higher education programmes in game development, consequently framing the data in socio-material perspectives on game industry platforms as application ecologies.

CCS CONCEPTS

• **Applied computing** → **Computer games**.

KEYWORDS

Finland, Sweden, Game industry history, platforms

ACM Reference Format:
Petri Lankoski, Mikolaj Dymek. 2023. Towards a History of Finnish and Swedish Game Industry Platforms. In *Foundations of Digital Games 2023 (FDG 2023), April 12–14, 2023, Lisbon, Portugal.* ACM, New York, NY, USA, 4 pages. https://doi.org/10.1145/3582437.3587214

1 INTRODUCTION

Although Latorre [22] claimed that "the analysis of contents and design trends in European video game production is virtually nonexistent", the history of the Nordic game industry has since then gradually evolved into an established field of inquiry, building on prominent contributions on a Nordic level (e.g, [2, 12, 24]), as well as with several other contributions on local Swedish (e.g. [23, 26]), Finnish (e.g., [13, 15]), Danish [19], Norwegian [9, 10] and Icelandic level [5]. Although neighbouring, Finland and Sweden present very different game industries prominently on the global stage – both share decades-long eminent positions as spearheads of the global game industry, market and medium. For two such relatively small countries (10 and 5.5 million inhabitants) they considerably overperform globally and belong to the top 10 highest-ranked game developer countries (based on the number of game developers) [1], or even the top 5 according to other industry sources [25], thus punching above their weight with massive industry exports and global industry impact. This paper aims to build on this body of research by complementing our own extensive empirical data (more than 700 data points) covering the Swedish and Finnish game industry during its first four decades.

2 THEORETICAL PERSPECTIVE

We approach the data set with a platform studies perspective. This approach "allows the investigation of how particular aspects of a platform's design influenced the work done on that platform" [4]. This approach has been proposed as an amalgamation of technology with cultural dimensions (e.g.[17, 21]). Approaching game development as any other (e.g. high tech, entertainment, digital, media, cultural, software) industry runs the risk of blackboxing (cf. [14]) which is what platform studies approach aims to avoid (cf. [4]). Platform studies explore how computing devices and software environments affect the characteristics of application software built upon them by focusing on programmability; the affordances and constraints of platforms; the connection of heterogeneous actors; and accessibility of data and logic through application programming interfaces (APIs) [21]. Previous game-related platform perspective research has shown that underlying development platforms influence creative game development processes [29, 30]. Understanding game design as a platform implies viewing it as part of sociotechnical systems where social dimensions are closely tied to different technologies, meaning that humans, artefacts, infrastructures, regulations and cultures form one system [16].

3 METHOD

Data was collected from multiple online databases between Mar and Nov 2022: MobyGames, IGDB, Games Database, and Wikipedia with 745 games. The data contains games released between 1979 and 2020 in Finland and Sweden. We collected data on game genres, game engines used in the game, platforms on which games were initially published, names of developers, developer nationality and types of graphics (3D, 2D, isometric, text), and the year of publication. Game engines were categorised with the following values: no engine, in-house and third-party. In-house engines are game engines that game companies have developed for their own use, third-party

FDG 2023, April 12–14, 2023, Lisbon, Portugal

ACM ISBN 978-1-4503-9855-8/23/04.
https://doi.org/10.1145/3582437.3587214

engine is engines that a developer can license or buy (e.g., Unity and Unreal).

Analysis was performed using the statistical computing language R. Potential differences between Finland and Sweden were tested with the $\chi 2$ test and p-values were calculated using the Monte Carlo test. Each decade was tested separately to get a better overview of industry development. Poisson regression was used to compare counts when the actual proportions differences were not the focus of interest.

4 RESULTS

Based on our sample, in Finland, 122 developers and in Sweden 227 developers published a game between 1979 and 2020. Fig 1 shows the breakdown of the number of developers and the number of developers who publish a game by year. Some developers are counted multiple times due to name changes. For example, Swedish developer DICE started as Digital Illusions.

Early games were developed from scratch but in the 1990s some games in our data started using game engines. The earliest example in our data of a game using a third-party engine is *BadMUD* (Balanced Alternative Techniques, 1990-) built on the LPMud engine.

Death Rally (Remedy Entertainment, 1997) used an in-house engine. It might be one of our data's earliest examples of the departmentalisation of the engine and game content. However, in other games, this is somewhat hard to assess since game credits and our databases might not contain this detail. More companies started introducing proprietary in-house engines: Starbreeze Engine, EA's Refractor Engine, and Epic Engine are examples of those.

In the late 1990s, Macromedia Director (first released for Mac in 1987 and for Windows in 1994) was used in a puzzle and/or adventure game development: *Safecracker* (Daydream Software 1997) and *Kosmopolska* (TATI Mixedia 1997) are our earliest examples, both created by Swedish developers. According to our data in the 2000s, multiple companies increasingly started using proprietary in-house engines. Paradox developed Europa (strategy games engine) for their *Europa Universalis* (Paradox 2000) and Grind introduced Diesel, first used *Ballistic* (Grind 2001). Both engines were later used to develop multiple titles.

Finnish developer Fathammer launched 2002 a commercial version of its X-Forge mobile game engine. In 2000, more games in Finland and Sweden were developed using a variety of engines such as CryEngine, Gamebryo, Adventure Maker, and Game Maker. After 2008 Unity started to grow to be the most widely used third-party engine in our data. 32.5% of games were developed using Unity between 2017 and 2020. For comparison, Toftedahl and Engström [27] found that 13.2% of games on Steam (making Unity 2nd most popular engine) and 47.3% on Itch.io were developed with Unity.

There are no significant differences in engines used between Finland and Sweden 2020s ($\chi 2$=3, p=1), in the 2000s ($\chi 2$=6, p=1), and in 2010s ($\chi 2$=3, p=1). The 1980s was not tested as no engine was the only case and we can conclude that there is no observable difference.

Fig 1 shows platforms the games were published by Finnish and Swedish developers.

One major shift was when PCs (MS-DOS and later Windows machines) became popular platforms during the 1990s. Development on consoles and mobile phones (first on the Symbian platform) started clearly showing up during the early 2000s.

In the 1980s, games developed in Finland were made for VIC-20 and Commodore 64 systems whereas games developed in Sweden were made for Commodore, ZX Spectrum and Amiga ($\chi 2$=10.80, p=0.009). While in general, in the 1990s platform use was not significantly different ($\chi 2$=6.78, p=0.076), the notable difference during this period was that Swedish developers focused on console games while Finnish were not. During the 2000s, publishing platforms were diverging ($\chi 2$=53.78, p<0.0001): PC games and console games were more frequent by Swedish developers. During the same time, mobile (mostly Symbian) and handheld platforms were more popular among Finnish developers. In the 2010s platform profiles continue to be different ($\chi 2$=34.47, p=0.0005): Swedish developers published more on PC than Finnish, and Finnish developers more on mobile (mainly on Android and iOS). There are no significant differences in the number of initial platform releases between Finland and Sweden (β=0.03, p=0.70) but the number of platforms slightly increased over time (β=0.01, p=0.002).

1980s games with 3D graphics used wireframe graphics and allowed 90-degree turns. A couple of games using isometric graphics were developed by Swedish developers quite early after its introduction. Pseudo-3D was used in some Finish developed games also relatively early. In 1993, Finish developer Bloodhouse released *Stardust,* a space shooter game with 3D graphics, followed by *Superstardust* in 1995 by Remedy. Swedish Digital Illusions published *S40 Racing* in 1997. The increase in the number of 3D games happens around the time the third-party engines (supporting full 3D) started to gain ground. The shared of each type of graphics are shown in figure 2.

5 DISCUSSION AND CONCLUSIONS

It has been argued that the demo scene, a subcultural hobby graphics and sound application programming scene, has been important in the formation of the game industry in Finland and Sweden [11, 28]. For example, Finnish developers Bloodhouse and Remedy, or Swedish game pioneer Digital Illusions had notable demo scene members employed in their early days. In this sense, Finland and Sweden, are similar to the UK, where, according to Izushi and Aoyama [8], the game industry was also driven by the computer hobby scene. In the US and Japan, the game industry was more tightly connected to start-ups and/or old industries moving to games [8].

We observe that early games were developed on home computers which were relatively affordable platforms in Finland and Sweden where purchasing power allowed ownership of those types of machines by youth and young adults. Access to platforms is necessary for development but also there need to be payers owning the platforms. Both Finland and Sweden still at that time had a good education level, e.g., in mathematics in the 1980s and 1990s at least according to PISA's educational system evaluations results. Proficiency in mathematics is beneficial in game development where 3D graphics, for example, require an understanding of linear algebra.

The increase in the number of published games in the early 2000s (cf. fig 1) can partly be attributed to third-party game engines which speed-up game development and also simplify some of the most

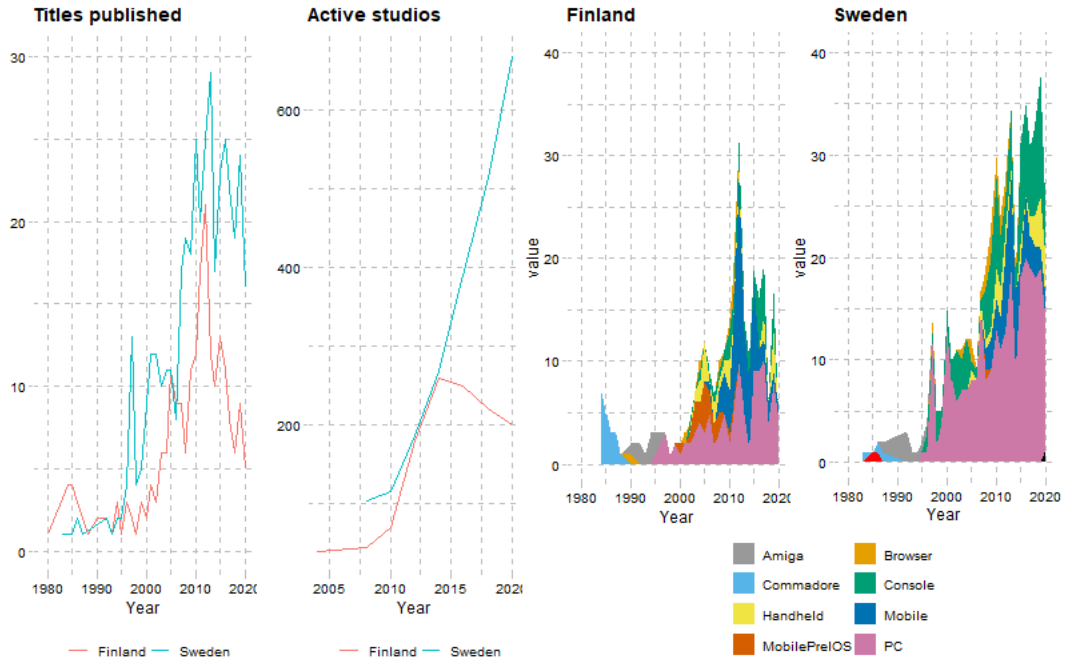

Figure 1: Number of developers publishing a game by year and the number of active game companies. The numbers of active game companies come from Neogames [18] and Dataspelbranchen. Platforms where games were initially published by year. One game can be published on multiple platforms. [6, 7] reports.

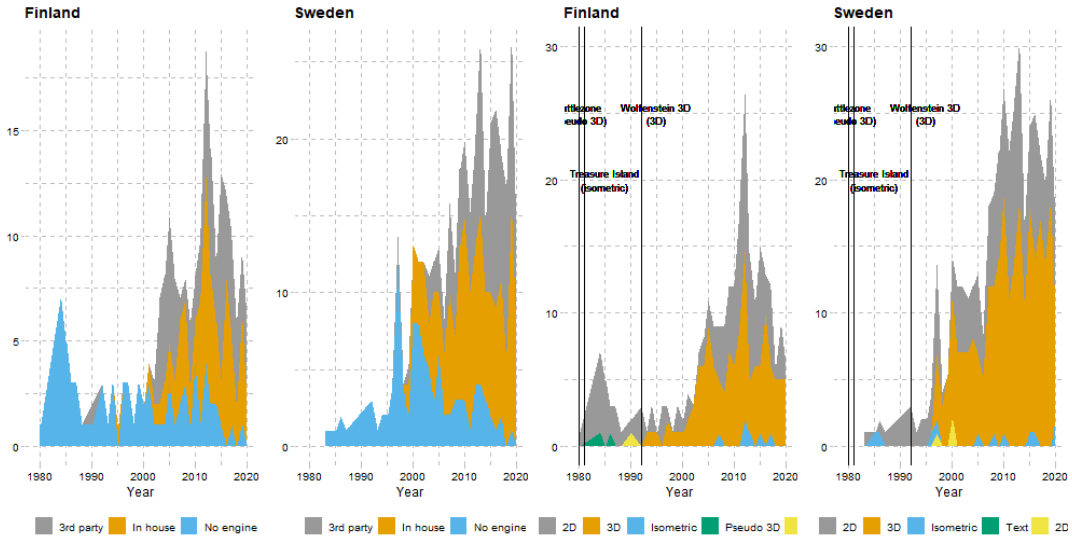

Figure 2: Engines (Development platforms) used in developing games and graphics in published games. Vertical lines mark a publication of a well know early game using that graphics mode. *Battlezone* (1980) with Pseudo 3D, *Treasure Island* (1981) with an isometric view, and *Wolfenstein 3D* (1992) with a full 3D.

challenging aspects of development (such as fast 3D rendering). The increase has been steady in Sweden with an exception for the 2009 recession and in Finland during the 2014 recession in Finland. We can hypothesise that game higher education programmes in development contributed to the steeper increase of game companies and published titles in Sweden compared to Finland from 2014 (cf. fig 1 and 2).

Higher education in game development started in Sweden in 2001 (cf. [3]). In Finland, it started later in 2005/2006. This began a process of establishing new knowledgeable people into the game industry.

Notably, the number of programmes and graduates is smaller in Finland than in Sweden, which might explain some differences between the countries.

From a platform studies perspective, our data combined with earlier research highlights rewarding historical insights about the dynamics of game industry platforms in Finland and Sweden with dimensions such as influence by demo scene, price of hardware/software (computers), mathematics education, third-party game engines, and finally higher education programmes in game development. A categorisation of these dimensions is constituted by material tools (computers, game engines), cultural (demo scene) and public (mathematics education, economic climate/recessions) - a framing from material towards more abstract levels of immateriality. This is in line with Bogost and Monforth's [4] claim that the notion of *platform* is not only about hardware, but involves numerous socio-material layers with entanglements [20] between different layers and levels. As Plantin et al [21] put forth, platform studies are evolving from programmability to application ecologies, what this entails, to a certain extent, is that the focus of platform studies should encompass a wider context beyond programmability by including associated cultural levels. Our empirical data arguably indicates that this is reflected in both the Finnish and Swedish game industry cases. On a programmability level, our data indicates historical perspectives on Finland and Sweden in terms of computer systems and third-party game engines. A pivotal contribution is constituted by the application ecologies level as our data confirms entangled historical links to the Finnish and Swedish demo scenes, as well as situates the ecologies of game engines and their programming/design with mathematics education, economic climate/recessions to the historical onset of higher education programmes in game development in Sweden and Finland.

Our data constitute a valuable contribution to the history of the Nordic game industry in general and form a platform studies perspective in particular. For future research historical platform studies of other Nordic countries, but also other geographical cluster areas of the global game industry could be expanded in order to further industry perspectives on game industry platforms.

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