Learnings From The Case of Maple Refugees: A Story of Loot Boxes, Probability Disclosures, and Gamer Consumer Activism

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Figure 1: Truck protests organised by *Maple Story* players. Retrieved from: Maple Inven (Web forum), inven.co.kr/board/maple (Online post, 24 February 2021).

ABSTRACT

The article synthesises what we learned from reviewing the player activism of the "Maple refugee" incident and applies the insights to the European video game industry and commercial context. The Maple Refugee incident was perhaps one of the most disruptive video game incidents that occurred in South Korea in recent years. It saw tens of thousands of Korean players from the game *Maple Story* (Nexon, 2003) mobilised in unprecedented online and offline protests in Spring 2021. Together with players from other free-to-play (F2P) games, *Maple Story* players rallied against the industry norms of monetising with loot boxes and the industry self-regulatory approach to probability disclosures to address potential harms. This culminated in the social phenomenon of the proxy activism method of 'truck protests,' rallies of crowdfunded rented trucks displaying protest messages instead of people mass-gathering in public during the COVID-19 pandemic. Based on the English timeline of the incident collated by Park et al. (2023), we dive deeper into the case with a multidisciplinary group of experts from game studies, law, and human-computer interaction and highlight various issues present in this case: the regulation of loot boxes and probability disclosures, the social pillars of player activism, player trust and theorycrafting, and game production. The paper contributes to the deepening of the industry's understanding of F2P game business while diversifying the Western-centric discourse of the game research landscape by calling for further cross-cultural and cross-disciplinary inquiries into current video game issues.

CCS CONCEPTS

• **Information systems** → **Massively multiplayer online games**; • **Applied computing** → **Computer games**; *Law*; *Sociology*.

KEYWORDS

Loot boxes, Probability disclosures, Gamer and player activism, Video games, Monetisation, Videogaming law and regulation, Consumer protection

ACM Reference Format:
Solip Park, Maarten Denoo, Eva Grosemans, Elena Petrovskaya, Yaewon Jin, and Leon Y. Xiao. 2023. Learnings From The Case of Maple Refugees: A Story of Loot Boxes, Probability Disclosures, and Gamer Consumer Activism. In *26th International Academic Mindtrek Conference (Mindtrek '23), October*

Mindtrek '23, October 03–06, 2023, Tampere, Finland

ACM ISBN 979-8-4007-0874-9/23/10.
https://doi.org/10.1145/3616961.3616963

03–06, 2023, Tampere, Finland. ACM, New York, NY, USA, 12 pages. https://doi.org/10.1145/3616961.3616963

1 INTRODUCTION

In February 2021, a single patch note from the South Korean free-to-play (F2P) massive-multiplayer online role-playing game (MMORPG) *Maple Story* (Nexon, 2003) [65] (see figure 2) sparked unprecedented player activism in South Korea (henceforth Korea), an incident that later became known as the "Maple refugee" incident ("Maenan-min" in Korean). Players mobilised against the game's randomised loot box systems [88, 89], one of its core monetisation mechanics that buttressed its two-decades-long complex virtual game economy. Players view these systems as exploitative due to the probabilities of obtaining various outcomes being undisclosed but nonetheless cost them significant amounts of real-world money by creating false expectations. While calling themselves refugees from *Maple Story*, players revolted by mass exodus from *Maple Story* [49, 105], estimated to be up to 400,000 players though unverified sources. Through crowdfunding, internet and media campaigns, (truck) protests, and political rallies, players also advocated for the making of legislation to better regulate loot boxes in video games [54, 71]. This sentiment also spread to other Korean F2P players communities [44, 45, 48] and eventually led to the introduction of a new law requiring loot box probability disclosures, rather than relying only on industry self-regulation [44, 49, 69].

Figure 2: A screenshot of *Maple Story* (retrieved from Nexon)

The incident demonstrated the power of player mobilisation as a force that could challenge the game industry's business practices, and how not disclosing the probabilities for obtaining random rewards risks creating a vulnerable in-game economy and opportunities for conspiracy thinking among the player base [54]. The tumultuous nature of this incident also exposed a worrying scenario when the F2P [4, 53] and game-as-a-service [28, 92] business models are combined with the gamblification [1, 60] and commoditisation [62, 106] of gameplay.

Korea is known to be one of the first nations to widely adopt F2P game business models since the early 2000s [4, 38]. The market leader for this monetisation model, Nexon (also the company behind *Maple Story*)[1]. The company has vast experience in operating F2P games, and its core and loyal *Maple Story* fan base (adults between their 20s and 30s [2, 81]) has been playing *Maple Story* since childhood (i.e., for up to two decades). And yet, the company faced unprecedented player revolts, which eventually led to the adoption of legislation that has fundamentally impacted how the Korean game industry is regulated. So what went wrong? What could we learn from this case? And how can all of this be relevant to other emerging F2P game businesses in Europe?

This paper is a follow-up study of the timeline of the Maple Refugee incident [73][2] that brought together a group of multidisciplinary authors from game studies, law, and human-computer interaction to answer the question: *What insights can be derived from the South Korean Maple Refugee incident for the Western context?*

The authors have previously assessed recent European game industry and academic discourse, particularly on the topic of loot boxes and regulation [8, 25, 78, 97, 98]. We retrospectively explored secondary online sources from *Maple Story* players during the time of the incident, namely some of the game's biggest player web forums like Maple Inven (https://maple.inven.co.kr/), which is where players first aired their grievances and discussed the issues in the early phase of the incident. The authors looked into online posts, public statements, and press releases from the players. Moreover, we reviewed some of the highly profiled videos of *Maple Story* streamers' and game critics' recordings published between February and April 2021. Korean media (e.g., KBS and MBC) coverage of the incidents was also reviewed. The authors' first workshop was organised in November 2022 via the online meeting platform Zoom, which was recorded and noted for further reflection. We then continued the discussion remotely through Q1 2023 using a dedicated Discord server, freely reflecting and sharing views on the incident while contributing to the manuscript with perspectives from our various fields of expertise. Relevant news and updates coming from Korea since the incident were also monitored, especially those related to the new governmental intervention on the issue of probability disclosures [56, 69]. This paper summarises those discussions, with the aim of enriching both industry and academic knowledge.

Through a literature view, the paper first explores the existing studies that help in understanding the context of the incident. We then explain what happened during the Maple Refugee incident with a summary of the timeline collated in Park et al. (2023) [73]. Next, we discuss and apply insights derived from this Korean incident more broadly to video game regulation, player culture, and game production. We argue that the Maple Refugee incident is unlikely to remain an isolated case in the Far East. Similar conflicts between players and members of the industry about F2P monetisation could occur in any gaming market in the future, as the player

[1]Nexon (https://www.nexon.com/)) was founded in Korea in 1994, and went public on a stock exchange in Japan in 2005. As of writing, the company's headquarters is in Tokyo while its primary business operations, game development, and live service provision, including for *Maple Story*, are handled by its main office in Pangyo, a city near the South Korean capital city of Seoul [46]. It services 60 games in over 100 countries, most of which are F2P games. Well-known titles include *Maple Story*, *Dungeon & Fighter*, and *FIFA Online 4* [57].

[2]Available in the Open Science Framework https://osf.io/34vjz/?view_only=98cadaa3d1e0487c85072e0a9e2b9657

resistance (with public calls for regulatory intervention) against perceived corporate greed extends beyond the arbitrary boundaries of East and West or global North and South (e.g., global player resistance towards an internationally distributed F2P mobile game *Diablo Immortal* [10, 32] (see also [29, 30, 76]). Therefore, reflecting on this incident that happened in Korea, the country with a matured F2P game market, and with Nexon, the game company with one of the longest experiences in F2P monetisation mechanics [4, 38, 46], could be used to derive lessons for game developers and publishers in other regions using similar game business models. The cross-national and cross-disciplinary approach of this research also contributes to diversifying the game research discourse beyond the predominate, Western-centric narrative (see also [18, 95]).

2 LITERATURE REVIEW

2.1 Loot box regulation

Loot boxes are a type of in-game monetisation method that involves players spending real-world money in exchange for receiving random rewards [8, 21, 39, 101, 102]. They have been the subject of significant controversy: some have argued that loot boxes are structurally and psychologically similar to gambling [27]. Loot box spending is positively correlated with problem gambling severity [84, 108], meaning that companies are likely profiting disproportionately from vulnerable players experiencing gambling-related harms [14]. Therefore, many European countries have considered whether or not to regulate loot boxes. For example, Belgium has applied existing gambling law to attempt to 'ban' loot boxes [23, 63]; however, enforcement has been lacking such that loot boxes remain widely available for purchase in Belgium [98]. The Netherlands previously fined Electronic Arts for implementing allegedly illegal loot boxes in its *FIFA* games, but that enforcement action has since been overturned on appeal by the court. That judgment thus arguably rendered all loot boxes unregulable and therefore 'legal' under Dutch gambling law [99]. The UK recently decided not to impose legal regulation on loot boxes and to instead first try to rely on an industry self-regulatory approach focused on age assurance [33].

China and Taiwan now require loot box probability disclosures by law [102]. Other countries require these through industry self-regulation [100]. Korea used to be one such country that favored an industry self-regulatory approach to monitoring loot box systems through the nationally-certified, industry-backed Game Self-governance Organization of Korea (GSOK) [34]. However, after public uproar, including the protests by *Maple Story* players, this requirement has since been put on a legislative footing: loot box probability disclosures will be required by law starting from 22 March 2024, as set out in the newly revised Article 33(2) of the Game Industry Promotion Act [69].

2.2 Social pillars of player activism

When researching game events, it is important to take into account other social pillars in the gaming ecosystem. Therefore, we identify two, partially overlapping categories of influential members in the game's player social groups that were also involved in the Maple Refugee incident: *streamers* of the game [35, 36] and players with high financial performance (often identifying, and referred to, as 'whales') [18, 76, 80].

Video game streaming has been on the rise in recent years with, for example, over 31 million daily visitors on Twitch[3], the world's most popular game streaming platform. Live game streams serve as meeting grounds for player communities to emerge, socialise, and participate [36, 58, 110]. Previous research has also indicated that players often turn to streamers when seeking information on video games [35]. It is, therefore, no surprise that streamers play an increasingly important role in the video game industry and are often used in the promotion of video games [94]. The authenticity of streamers and their proximity to their viewers enable them to successfully influence consumer choice and opinion. In Korea, high social motivation drives the popularity of live streaming and its gift-giving behaviours, known as "do-ne" (an abbreviation of the English word "donation"). These behaviours involve viewers voluntarily gifting streamers with either real money or virtual currency, in order to showcase their genuine follower-ship, thus transforming virtual social interaction into a commodity [106].

High-spending players are those who spend a significant amount of real money on games [7, 9]. It is known that game companies pay particular attention to high-spending players and their gameplay behaviors (e.g., spending history and gameplay hours) as these individuals are valuable resources for the company's revenue stream [107]. Some game streamers, but not all, are also high-spending players. To illustrate, the F2P mobile game *Diablo Immortal* [32] received huge attention from numerous game streamers upon its release, with some spending upwards of hundreds of thousands of US dollars on the game's loot box system in order to be 'better' at the game, gain online visibility, or to publicise the game's excessive monetisation scheme [79, 87].

2.3 Theorycrafting

"Theorycrafting" (also known as "rule mining") refers to one's attempt to "mathematically analyse game mechanics in order to gain a better understanding of the inner workings of the game [41]". It involves players, often those of online games, devoting their own independent play to study, experiment with, and discover the mathematical formulae underlying the digital games' system. This could include testing various virtual areas, levels, enemies, equipments, and abilities either by themselves (e.g., playing the same level multiple times) or through data mining of the source code using add-ons or mods [61]. It is often performed by the most dedicated players, ready to spend a great deal of their time and effort to master the game in a scientific manner [90] with the goal of discovering how to optimise their play tactics through so-called "research." Players also actively tend to share their crafted (or mined) rules on the internet, constructing a collective productive discourse about the game and even reshaping how the game should be played [75]. In the case of *Maple Story*, fan forums such as Maple Inven function as a primary community channel where players share the results of their experiments. Over the years, these communities accumulated numerous posts and manuals, which are often re-shared by game streamers, on how to defeat certain levels, where to obtain certain items, and what gears with which stats are more valuable during gameplay.

[3]See: Twitch Internal Data, https://twitchadvertising.tv/audience/ (Online company announcement, December 2022).

2.4 Imposed regional differences in game production

While games are often depicted as universally distributed creative commodities, in reality, it is also cultural production that operates regionally with a unique set of game design and business norms [26, 42, 50, 83]. Recently, as the games' virtual economies became more directly connected to real-world money, there have been more calls for regional regulation of game businesses and production that would affect only certain jurisdictions but must be separately addressed by companies (see also [14, 24, 60]). One such case in the West is Belgium's 'ban' on loot boxes, even though it has been poorly enforced on game publishing platforms in practice [23, 63, 97]). A similar case in Korea was the "Shutdown law" enacted in 2012 intending to reduce minor's excessive gameplay behaviours [3, 13, 68], which mandated all internet-connected games in Korea to disallow players under 16 from accessing games between 0:00 - 6:00 AM. This law has since been repealed and was no longer applicable from 2022.

Local game production stakeholders (e.g., game studios and developers) need to invest in a collective effort to establish broader strategies to comply with these state regulations, as previous attempts have proven largely unsuccessful [97, 98, 100]. However, it is also important to note that not all game productions are valued equally, but rather vastly distributed and stratified [11, 74]. The "shutdown law" in Korea, for example, imposed a significant entry barrier for small and medium-sized game studios and indie game developers that were not able to afford centrally-controlled player identity and age verification systems [3]. It also hindered foreign game publishers that did not wish to (or were not able to) comply due to financial reasons or other region-specific reasons (e.g., GDPR in Europe) [93]. Such regulation widens the industrial imbalance and wealth disparities in the game industry, arguably hindering innovation by stifling up-and-coming game startups [72].

3 WHAT HAPPENED

3.1 Maple Story

Founded in 1994, Nexon became one of the first online game companies to adopt the F2P business model, starting with the game *QuizQuiz* (1999) and the great success of *Crazy Arcade* (2001) [4, 22, 67]. The company then released the PC-based F2P MMORPG, *Maple Story*, a 2D side-scrolling adventure game, in 2003. The game uses various types of loot boxes and other in-game purchases involving randomisation as its primary income source and is regarded as one of Korea's longest-operating and most financially successful F2P games [2].

In *Maple Story*, players can improve their character through usual gameplay and by using in-game *Maple Story* currency or game currency purchasable with real-world money. There is also an in-game marketplace system, "Maple Auction," in which the players can trade items and check their market value on a real-time basis (see figure 3)[4]. The game allows for so-called "additional stat upgrades" ("Chuga Option" in Korean, abbreviated as the "Chu-op"), through which in-game equipment (e.g., weapons and armors) can be upgraded by adding randomised stats up to three times (e.g., additional attack damage to boss monsters and critical hit rates increase) by expending significant amounts of consumable in-game resources. It would cost a minimum of one million KRW (roughly 800 USD) to completely upgrade each piece of *Maple Story* equipment. As each character has 25 pieces of equipment, it would cost well over 20,000 USD to completely upgrade the entire in-game character. Notably, some randomisation processes in *Maple Story* also come with a small chance of destroying or downgrading the equipment. Therefore, it is realistic to speculate that the game's end-game gears could cost billions of KRW (or hundreds of thousands of USD). Additionally, there are a number of in-game items (e.g., in-game pets and cosmetics) that can be used only for a limited period of time after being purchased (e.g., 7-days or 30-days) and thus require reoccurring payments to possess continuously. Various items that are essential for competitive gameplay are only obtainable through loot boxes purchasable using real money.

Figure 3: Game streamer pjs9073 upgrading his equipment by consuming in-game items (left) and then going on to "Maple Auction" to check the equipment's new market price (right). Streamer pjs9073 was one of the high-spending *Maple Story* game streamers who later stopped streaming the game after the Maple Refugee incident.

Before the incident in 2021, Nexon never revealed the probabilities behind the Chu-op system or those of any other randomised monetisation mechanics in *Maple Story* [49, 71]. Players conducted years of theorycrafting experiments based on a mass amount of their collective data obtained by spending real money (such as the case shown in figure 4[5]), and building a community and market consensus on which certain additional stats are more challenging to acquire—and thus more valuable—than others that are more common and therefore deemed less valuable. If the acquired or upgraded equipment is deemed valuable in the market, the player can sell it at the Maple Auction to gain profit. They could even use 3rd party traders (e.g., virtual game currency trading platforms) to convert that profit into real money or vice versa.

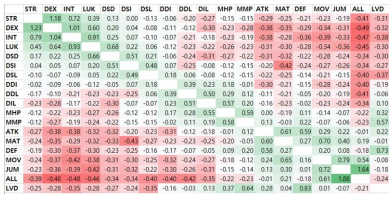
3.2 Maple refugee

On 18 February 2021, *Maple Story* announced the following patch update: "[Upon this patch,] all additional options that can be granted to items [Chu-op equipment stat upgrades] are *modified* to be granted *with the same probability*" (emphasis added)[6]. As the Chu-op system involves a significant amount of real-world money, changing such features meant that the in-game marketplace economy

[4]Retrieved from: YouTube (Video), https://youtu.be/H9InmTfUJ0A?si=nTvSzulk04T9snJU (Online stream, 8 October 2020).

[5]Retrieved from: Maple Inven (Web forum), https://www.inven.co.kr/board/maple/2304/19643 (Online post, 12 February 2020).

[6]See: Maple Story (Website), https://maplestory.nexon.com/Testworld/Update/435 (Online company announcement, 18 February 2021).



	STR	DEX	INT	LUK	DSD	DSI	DSL	DDI	DDL	DIL	MHP	MMP	ATK	MAT	DEF	MOV	JUM	ALL	LVD
STR		1.18	0.72	0.39	0.13	0.00	-0.13	-0.06	-0.20	-0.27	-0.15	-0.15	-0.29	-0.25	-0.21	-0.23	-0.19	-0.41	-0.31
DEX	1.23		1.01	0.60	0.20	0.04	-0.08	-0.11	-0.12	-0.30	-0.23	-0.25	-0.38	-0.35	-0.29	-0.34	-0.31	-0.49	-0.32
INT	0.79	1.04		0.91	0.25	0.07	-0.10	-0.07	-0.21	-0.18	-0.23	-0.19	-0.38	-0.28	-0.36	-0.39	-0.31	-0.47	-0.38
LUK	0.43	0.64	0.93		0.68	0.22	0.06	-0.12	-0.23	-0.22	-0.26	-0.23	-0.31	-0.30	-0.28	-0.34	-0.36	-0.45	-0.30
DSD	0.17	0.22	0.25	0.66		0.51	0.21	-0.06	-0.24	-0.31	-0.27	-0.22	-0.31	-0.32	-0.22	-0.28	-0.24	-0.34	-0.30
DSI	0.04	0.05	0.07	0.20	0.51		0.48	0.07	-0.25	-0.08	-0.12	-0.15	-0.20	-0.42	-0.24	-0.27	-0.26	-0.34	-0.27
DSL	-0.10	-0.07	-0.09	0.05	0.22	0.49		0.18	0.06	-0.08	-0.12	-0.15	-0.22	-0.25	-0.14	-0.21	-0.15	-0.40	-0.37
DDI	-0.02	-0.09	-0.06	-0.12	-0.05	0.07	0.18		0.39	0.23	0.18	-0.01	-0.30	-0.21	-0.15	-0.28	-0.24	-0.40	-0.19
DDL	-0.17	-0.10	-0.21	-0.23	-0.23	-0.25	0.06	0.39		0.50	0.29	0.12	-0.11	-0.21	-0.05	-0.20	-0.19	-0.41	-0.06
DIL	-0.23	-0.28	-0.17	-0.22	-0.30	-0.07	-0.07	0.23	0.51		0.57	0.20	-0.16	-0.23	-0.02	-0.23	-0.24	-0.34	0.10
MHP	-0.12	-0.22	-0.23	-0.27	-0.26	-0.12	-0.12	0.17	0.28	0.55		0.59	0.00	-0.19	0.11	-0.14	-0.07	-0.22	0.32
MMP	-0.12	-0.27	-0.19	-0.24	-0.22	-0.15	-0.15	-0.02	0.11	0.19	0.58		0.13	-0.03	0.22	-0.07	-0.06	-0.23	0.57
ATK	-0.27	-0.38	-0.38	-0.32	-0.32	-0.20	-0.23	-0.31	-0.12	-0.18	-0.01	0.12		0.61	0.59	0.29	0.22	-0.01	0.22
MAT	-0.24	-0.35	-0.29	-0.32	-0.33	-0.43	-0.27	-0.23	-0.23	-0.25	-0.20	-0.05	0.60		0.27	0.70	0.40	0.19	-0.01
DEF	-0.19	-0.30	-0.37	-0.30	-0.23	-0.25	-0.16	-0.17	-0.07	-0.05	0.09	0.20	0.58	0.27		0.20	0.08	-0.18	0.73
MOV	-0.24	-0.37	-0.42	-0.38	-0.31	-0.30	-0.25	-0.32	-0.24	-0.27	-0.18	-0.12	0.24	0.65	0.16		0.79	0.54	-0.08
JUM	-0.23	-0.36	-0.39	-0.42	-0.31	-0.32	-0.22	-0.30	-0.28	-0.31	-0.15	-0.14	0.13	0.30	0.01	0.72		1.64	-0.18
ALL	-0.39	-0.48	-0.48	-0.46	-0.34	-0.34	-0.40	-0.40	-0.42	-0.35	-0.22	-0.23	-0.01	0.21	-0.18	0.61	1.88		-0.24
LVD	-0.25	-0.28	-0.35	-0.28	-0.27	-0.24	-0.35	-0.16	-0.03	0.13	0.37	0.64	0.28	0.04	0.83	0.01	-0.07	-0.21	

Figure 4: A chart made by an anonymous *Maple Story* player in February 2020, a year before the Maple Refugee incident. The chart lists estimated Chu-op probabilities based on the player's experiments with Chu-op odds and which combination of stats is more challenging to acquire and thus rarer (denoted in red) than others (denoted in white or green). This chart was later referenced among the players to refute Nexon's later disclosed probabilities.

would markedly fluctuate. The *Maple Story* developers later added that this update was intended to fix the in-game system, giving the impression that the Chu-op system has been running with some sort of technical bugs for many years in the past[7]. This meant that what the players have researched, or theorycrafted, was not something that the developers had originally intended. This infuriated the players, which eventually led to a player revolt.

The very next day, on 19 February 2021, a group of *Maple Story* players formed a task force team and began actively crowdfunding to coordinate a series of truck protests (see figure 5)[8], emulating what other Korean players of *Fate/Grand Order* (Aniplex, 2015) [5] did against its Korean publisher Netmarble back in January 2021 [104][9]. Also known as the "truck-meta," a truck protest is a form of proxy activism, as people could not gather on the streets due to the COVID-19 pandemic at the time. Instead, crowdfunding was used to rent and dispatch trucks with an LED screen displaying messages with the players' demands. By referring to themselves as "consumers [of the game]" in public statements[10], *Maple Story* players soon united and organised media campaigns and pressured parliamentary lawmakers to push through legislation to mandate companies to make probability disclosures for in-game purchases involving randomisation, such as loot boxes. These actions were taken in a matter of days and exclusively online, as the country was then under strict social distancing measures due to the COVID-19 pandemic. The amount of money (roughly 8,000,000 KRW or about 7,000 USD) spent to send truck protests every day to Nexon and Korea's national assembly building for a week, from the last week of February until early March, was crowdfunded within merely an hour after the task force team's announcement of the plan[11]. Such crowdfunding campaigns for truck protests continued every week until mid-March 2021[12]. In addition, individual players rented and dispatched LED trucks at their own expense[13]. The players also began an online campaign, the "0 KRW challenge", vowing that they would not spend money on *Maple Story* and sharing their in-game player ID and total in-game spending from January to mid-February 2021. The task force team then accumulated a list of campaign participants and estimated that Nexon would "lose" at least 1,082,721,970 KRW (roughly 815,000 USD) of revenue for the month of March[14]. This number continued to grow as the days went by and more reports of high-spending players quitting came in[15] [47].

Figure 5: *Maple Story* players' truck protest standing in front of the Nexon company headquarters in the city of Pangyo, Korea (8 March 2021) (left), and *Maple Story* truck protest sighted in front of the Korea's national assembly building (25 February 2021) (right).

Maple Story players' revolt quickly allied itself with other F2P game communities in Korea, whose players shared similar negative sentiments towards the game studios' exploitative monetisation strategies (e.g., *Lineage M* [64], *Fate/Grand Order* [5]). Players fought against the industry's decades-long advocacy for a voluntary free-market approach to making probability disclosures that saw the industry self-regulating its own behaviours rather than being regulated by law [34, 49]. Despite Nexon trying to appease its players by making several public statements promising in-game compensation, the situation continued to escalate.

This massive player mobilisation incident eventually pushed Nexon to publicly disclose the game's monetisation mechanics' probabilities on 5 March 2021[16]. This was the first time ever in Nexon's history that such information was published, thus representing a triumph of the players' activism. Nexon even further disclosed the relevant probabilities for most of their other games in the following weeks (e.g., for *FIFA Mobile* [6] and *Counter-Strike Online* [66]).

However, the disclosures revealed more exploitative design features in *Maple Story* that players were previously unaware of. The one that particularly angered the players was the maximum cap

[7] See: Maple Story (Website), https://maplestory.nexon.com/News/Notice/133192 (Online company announcement, 19 February 2021).
[8] Photo retrieved from: Inven news, https://www.inven.co.kr/webzine/news/?news=252666 (Online article, 8 March 2021) & Issue Today (News), https://www.etoday.co.kr/news/view/1998958 (Online news article 26 February 2020).
[9] *Fate/Grand Order* players in Korea rallied against the game's Korean publisher Netmarble, criticising the company's insufficient management of player relations and inadequately organised events. It is known to be one of the first Korean player revolt cases that adapted trucks protest method, which was once deemed as part of K-POP fan culture [104].
[10] See: Maple Inven (Web forum), https://www.inven.co.kr/board/maple/2299/6319399 (Online post, 19 February 2021).
[11] See: Maple Inven (Web forum), https://www.inven.co.kr/board/maple/2299/6380281 (Online post, 23 February 2021).
[12] See: Maple Inven (Web forum), https://www.inven.co.kr/board/maple/2299/6453932 (Online post, 1 March 2021).
[13] The number of these individually sent truck protests could not be verified.
[14] See: Maple Inven (Web forum), https://www.inven.co.kr/board/maple/2299/6378905 (Online post, 22 February 2021)
[15] See: Maple Inven (Web forum), https://www.inven.co.kr/board/maple/2299/6483761 (Online post, 4 March 2021).
[16] See: Maple Story website, https://maplestory.nexon.com/Guide/CashShop/Probability/RoyalStyle (Web page, 5 March 2021).

embedded in some of the Chu-op stats: most notoriously, the hidden ceiling for the highly sought-after "additional attack to the boss monsters" stat. Because relying on this particular stat was believed to be crucial for reaching the end-game, players felt that they were fooled by the company's manipulation all along into trying to obtain something that was ultimately unattainable. This shifted the discourse into a fundamental debate about the structure of the Korean game industry as a whole, which, in turn, gave rise to more media and legislative discussions [44, 49]. Public broadcasting channels in Korea, for example, began to report about the incident as if it is equivalent to game companies' systematically committing stock market manipulation in the virtual economy[17], labeling Nexon's actions as "probability manipulation"—the term that was widely used also among the *Maple Story* communities during the incident.

At the same time, due to mounting bitterness generated through fan posts mixed with mis- and mal-information, the player communities rapidly became polarised. Some began to question the legitimacy of those who first initiated the truck protests, based on whether they were truly committed 'consumers' of *Maple Story* who have already spent significant sums of money on the game, sparking the dispute between high-spending players versus the low-spending (and casual) players. This later culminated in online harassment and personal attacks on each other that permanently damaged the game's communities. In the midst of this war-like atmosphere, the hearing session between the *Maple Story* developers, represented by the company executives, and players was held and live-streamed on 11 April 2021, but ended with only bitter open-ended remarks and criticisms being hurled at the company (see figure 6)[18].

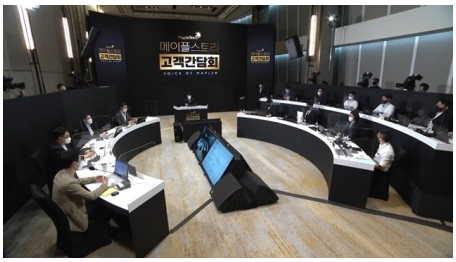


Figure 6: A screenshot of the hearing session between *Maple Story* developers and players, live streamed on 11 April 2021.

The incident sparked consecutive waves of mass migrations of *Maple Story* players to another F2P MMORPG, *Lost Ark* by Smilegate [82]—a game that had already disclosed (not all, but some) probabilities at the time of the incident, employed a less financially demanding monetisation scheme (e.g., no time-limited or obtainable through loot box-only purchases), and had the game's creative director more actively responding to players' demands. Migrating players began to call themselves "Maple refugee" and created fan images and memes online (see figure 7)[19]. *Lost Ark* later verified that its monthly active users increased by 427% (and daily active users increased by 306%) in March 2021 compared to the previous month [105], estimating that at least 400,000 additional new game accounts were created in *Lost Ark* between 24 February and 7 March 2021. However, it cannot be determined how much of these increases could be attributed solely to the mass exodus of players from *Maple Story* because other F2P games were witnessing truck protests at the same time (e.g., in relation to *Lineage M* by NCSoft). Nevertheless, this led to the surprising success of *Lost Ark* when other F2P MMORPGs in Korea performed poorly in 2021, with a whopping 2,638% year-over-year profit increase by the end of 2021, despite mounting infrastructure and labour costs [52]. In contrast, Nexon reported -18% year-over-year profit loss in 2021 [55].

Figure 7: A comical portrayal of the Maple Refugee incident, illustrated by an anonymous player. Two *Maple Story* players were represented as mushroom-like characters from *Maple Story* crying out with the sound of "Mae- (Meh-)" (the first syllable of the word 'maple') being welcomed by a green bean-like character from *Lost Ark*.

Player's consecutive waves of truck protests soon gained the mainstream media's attention, which further developed the movement into a political push to establish a justification for mandating probability disclosures by law [56, 103]). Since most *Maple Story* players were adult voters (as the game's core players are 20 to 30 year-olds with strong purchasing powers [12, 81]) the issue began to gain attention at the national parliamentary level. Just two years later, on 27 February 2023, a motion to partially amend the Game Industry Promotion Act was passed at the Korean National Assembly [69]. Coming into effect from 22 March 2024, this new law will obligate game companies to display the probabilities and relevant information relating to in-purchases involving randomisation [69]. Furthermore, the proxy activism method of the truck protest continues be popular even today in Korea, becoming a new normal of gamer activism even after the pandemic (see [45, 48]).

4 LEARNING FROM THE MAPLE REFUGEE CASE

The Maple Refugee incident should be regarded as a signal by F2P [4, 67] and game-as-a-service businesses [28, 31] that their monetisation models may not be sustainable. Better understanding Korean players' resistance to the game industry's business norms would be beneficial to global game companies and agencies as they are also facing similar conflicts elsewhere. Therefore, we discuss the

[17] See: Videomug - SBS NEWS (News, YouTube channel), https://youtu.be/hk-VYSEtJP8 (Video, 11 March 2021).
[18] See: Maple Story YouTube channel, https://www.youtube.com/live/_B-tUToiun8?feature=share (Video, 11 April 2021).
[19] See: Coconut-emoji (blogger), https://coconut-emoji.tistory.com/58 (Online post, 24 February 2021).

key lessons that could be learned from this case and their relevance to the European context.

4.1 Regulations on loot boxes

From a regulatory perspective, *Maple Story*, or rather Nexon, was arguably obliged by industry self-regulation, already in force *before the incident* in Korea, to make probability disclosures [49, 54]. Back then, Korea's self-regulation explicitly stated that where it is possible to enhance an in-game item directly or indirectly using real money, but there is a random risk of that item being lost during the process, then the relevant probabilities must be disclosed [34, 56, 103]. However, this was not done for the Chu-op system in *Maple Story*, which appears to be an obvious breach of self-regulation, but no enforcement actions have been taken. It is notable that the Korean self-regulation specifically included this type of randomised monetisation mechanic into its ambit separately from the *gacha mechanics* or the acquisition of characters, skins and other rewards through randomisation [95], which were governed by different sections of the self-regulation [34, 56]. This suggests that some distinction is being made between the two types of mechanics, similar to how Chinese regulation referred to both 'randomised pull mechanics (i.e., loot boxes and gacha mechanics in a more conventional sense)' and 'randomised fusion mechanics (i.e., intended to cover mechanics like the Chu-op system)' [96]. It is unclear whether it is helpful for regulatory purposes to distinguish between the two as both would constitute an in-game transaction with randomised elements, and the aesthetic elements that differentiate them are not necessarily psychologically relevant or objectively applicable by a regulator. There is indeed a debate in the academic literature as to whether different types of in-game purchases involving randomisation, such as 'loot boxes' and 'social casino games,' should be distinguished and treated separately [102, 109]. For example, the ESRB (Entertainment Software Rating Board) and PEGI (Pan-European Game Information), which provide age rating information in North America and Europe, respectively, do not distinguish between these subcategories and uniformly apply their self-regulation requiring games containing in-game transactions with randomised elements to be labelled with a warning to *all* such mechanics [97]. Further research examining and clarifying different types of randomised monetisation mechanics in video games is welcomed.

Besides industry self-regulation, consumer protection law more generally also applies to loot boxes. Indeed, Nexon was fined in 2018 by the South Korean Fair Trade Commission for failing to disclose the probabilities of obtaining random rewards from loot boxes sufficiently accurately. The enforcement action was taken because Nexon gave consumers the incorrect impression that various random rewards had the same probability of being obtained when in fact they had different probabilities [15, 16, 19]. It is interesting that enforcement action was taken when the disclosed probabilities gave an incorrect impression; however, failing to disclose probabilities at all—as occurred with the Chu-op system of *Maple Story* until the patch note and the ensuing incident—did not lead to enforcement actions being taken. This might well be due to the relevant regulator having shifted its focus to other issues, rather than actively deciding not to enforce the law. Enforcement actions should of course have been taken in both cases to ensure that consumers would have been fully informed and not misled. Various regulators of consumer protection law in Europe and North America all have powers to take enforcement actions against games for not disclosing probabilities and for disclosing inaccurate (or even intentionally false) probabilities. They should do so promptly as a way to minimise the potential harms of loot boxes and protect consumer rights that were already guaranteed by existing law [51].

A consensus between the industry and the public on how best to transparently handle player communication in relation to in-game monetisation mechanics involving randomisation would be mutually beneficial and is needed for the game-as-a-service business model to be sustainable, given the risks underregulation presents to consumer interests and overregulation presents to industry interests [78, 102]. There is also a need for future studies to assess industry practice (e.g., compliance) in response to regulatory requirements: for example, whether the requirement to disclose probabilities in the since amended Game Industry Promotion Act in Korea will, from March 2024 onwards [69], be duly complied with by companies and actually enforced by regulators when cases of non-compliance are identified.

4.2 Streamers and 'whales' in the Maple refugee context

The details of the Maple Refugee case also shed light on sociological processes at play in gaming communities. Notably, the mass transition away from *Maple Story* and towards other games appears to have been driven by strong social pressures. As mentioned before, two important social pillars must be taken into account: video game streamers on one hand, and high-spenders on the other.

In the Maple Refugee case, video game streamers actively livestreamed their views on the 18 February 2021 patch note and conducted experiments on the newly updated Chu-op probabilities that could sway viewers' opinions. A qualitative review of some of the highly profiled game streamers who regularly used to play *Maple Story* between 2020-2021 revealed two distinctive patterns: streamers either actively conducted several live stream sessions criticising *Maple Story* and engaging in the online discourse, or they did not mention the incident and suspended all *Maple Story* related live streams either temporarily or permanently. Those who criticised the game were actively vocal about what are "good" and "bad" qualities of game businesses and labeled Nexon's practices in *Maple Story* as negative. Some streamers even prompted massive migration together with its subscribed viewers, while others remained to play *Maple Story* but were actively involved in the players' resistance (e.g., physically attending the hearing session with Nexon on 11 April 2021 or live streaming it). As such, streamers played a large role in spreading discontent among players, both directly through their own criticism (e.g., expressing their views on stream verbally or visually) and indirectly through providing a space for players to interact with each other (e.g., stream chat, donations, or subscriptions so as to express the viewer's support of certain views) [36, 40]. They acted as high-influence nodes in the social network as they have connections—or "edges" linking them to other players—and by extension, their disappearance from the network has ripple effects. Thusly, streamers (many of whom

were high-spending players) exerted significant influence over the revolt.

The revolt became a wildfire when a significant number of high-spending players quickly put up their items for auction after the 18 February 2021 patch note and boycotted making in-game purchases individually or as a group in a coordinated manner through the "0 KRW challenge." This caused the overall market value of those items to decrease greatly. The rarity, monetary cost, and labour required to get an in-game item are directly related to the social prestige associated with owning it [37]. It is therefore likely that the precipitous drop in item value diminished players' perceived emotional and financial investment in *Maple Story*, and increased their willingness to switch to a new game, in this case, predominantly to *Lost Ark*.

It is important to note that some of the high-spending players of *Maple Story* were also streamers, with their own direct channel and fan-base to help spread their voices. There were several instances of well-known *Maple Story* streamers either spending their own money or receiving donations from players to do experiments on newly introduced random odds of Chu-ops between 18-25 February 2021. These were then followed by live streams showing their "bankruptcy" moments (i.e., auctioning off their once highly valued items at significantly decreased prices), which further swayed other players' views on the matter during and even after the incident (see figure 8)[20][21].

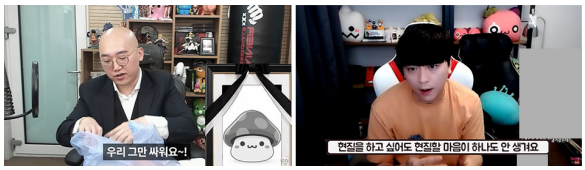


Figure 8: A screenshot of the former *Maple Story* streamer NODOLLY dressed up in a black suit next to the black-and-white portrait of *Maple Story* logo (the mushroom character), demonstrating a Korean traditional 'funeral' of the game on early March 2021, at the peak of Maple Refugee incident (left). A screenshot of another *Maple Story* streamer Pangeyo expressing his frustration, claiming, "I don't feel like spending money on this game (*Maple Story*)" several months after the incident, on December 2021 (Right).

The heavy influence of high-spending 'whales' on the player community also explains why *Maple Story* players' mobilisation did not escalate into a complete abolishment of the controversial Chu-op system itself. Rather, players remained to confront the game company's insufficient response to the market fluctuation. Meaning, what angered the invested players was the fluctuation of the in-game market, the crumbling social prestige of once-valued items and the company's reprehensible provision of inaccurate information or omission of material information, but not the free market concept of player trading or the adoption of randomised in-game purchases. There were also online disputes between, and harassment of, the players during the revolt over who is the truly committed "consumers" of *Maple Story*, suggesting a belief that those who spent more money may speak more loudly about their consumer rights. The Maple Refugee case shows a potential fallout when the commoditisation of gameplay based on real-world socio-economic status is normalised [17, 31, 106] even in a virtual game world.

Together, these two groups of streamers and high-spenders likely helped set in motion a negative feedback loop. Players saw other high-status players sharing negative views about the game and selling off in-game assets, which both signalled the weakened economic commitment to the game by players and an actual exodus from the game. This indicates how online opinions can be swayed, escalated, and spread quickly beyond control. Future research should further compare the Maple Refugee case with other similar incidents, which could broaden our knowledge and awareness of the respective behaviours of different player social groups and reveal the effects of the embedded commoditisation of gameplay and social actions by players.

4.3 The issue of trust and prevention of theorycrafting

The Maple Refugee case was compounded by a clash of differing views. What eventually sparked the players' revolt was the fact that uncertainty, on a micro-level, cannot be easily removed from the minds of players who have particular expectations, desires, and frustrations. On a surface level, the disclosure of probabilities in *Maple Story* proved to be an immediate clash between the players' preexisting *theory* and the actual *reality* underlying the in-game system.

The convergence of video games and gambling [24, 59, 60] has led to concerns that video game players are increasingly exposed to content that does not follow the 'skill-oriented' logic of their preferred medium, and that they may develop miscognitions related to their influence on the course or outcome of a random in-game event as a consequence. But *Maple Story* players were intrinsically motivated by a desire for intellectual satisfaction to construct a belief system around that persistent uncertainty through theorycrafting [41, 75], in an attempt to "optimise their gameplay" [90] and lessen constraints created by, for example, random number generations (RNG).

Things changed, however, when the instability of that uncertainty was highlighted by the fact that it could be changed by the corporation at will (i.e., "probability manipulation"). Instead of a manifestation of fandom, the Maple Refugee incident turned player's theorycrafting into a state of participatory surveillance [90] towards the authority on the matter, which in this case, is Nexon itself. Eventually, the player base proved to be a regulatory actor, leading to parliamentary action in Korea [69] (for a similar case in the West, see [77]).

So how can the industry do better then? Certainly, the game companies may consider improving their communication towards players, specifically through clarifying how chance is used in games with loot boxes. It is evidently clear that any doubts, theorycrafting,

[20] See: NODOLLY (Game streamer), https://youtu.be/QL427cOo78M (Video, 10 March 2021).
[21] See: Pangeyo (Game streamer), https://youtu.be/srmL2bbP6qk (Video, 30 December 2021).

and subsequent player subversiveness all stem from the information players were initially given (or not sufficiently provided with). A similar Western example is the *FIFA* series [85], which includes a cryptic notice stating that openings are "dynamically generated," implying that probabilities may be subject to change without explaining exactly how. In general, the way the odds of obtaining random rewards in loot boxes are disclosed have been found lacking, both in terms of them being difficult to find and providing insufficient information [100, 102]. RNG in games are also not held up to the same regulatory standards as those of traditional gambling devices, which often must be externally audited. The details of these RNG processes in video games are also not shared with researchers, policymakers, and other stakeholders. Future studies should include in-depth case studies of F2P players, focusing on their views on the game industry's current status and tactics of player communication (e.g., bug reports, bot reports and feedback), co-creation, and participatory cultures.

4.4 The risk of complex digital business models to game production

Another aspect of the Maple Refugee incident is the potential risk of the ever-growing complexity of F2P business models to game production and design, which require delicate collaboration and cooperation between dozens or even thousands of individuals. *Maple Story* is, as of the date of writing this paper, a nearly two-decades-old MMORPG with a complex economy. Similar to various other F2P games [4, 21, 67], its economy operates using multiple currencies (both in-game only and those purchasable using real-money), loot boxes and other randomised products, and many more highly complex systems that are beyond the scope of this paper. Furthermore, the game's economy flourishes with various third-party services for trading, game boosting, bots industries, etc. The complexity surrounding the game's virtual economy accumulated over many years means that every new game design and business decision (e.g., updates and patches) must fully account for its potential effect on the whole in-game economy, in addition to ever-changing state regulation in different countries. This further increases the risk that one tiny mistake from the developer could cause devastating consequences for the players' real money investment in the game, further exacerbating the complexity involved with the volatile operating conditions of game businesses [20, 30, 42, 43].

This also draws attention to concerns about imbalances found within the industry, such as wealth disparities. The increasing complexity of digital business models, including loot boxes, has led to calls for regulations and public safeguards to ensure consumer and player protection [31, 51, 100]. However, the question is: would all game companies—not just big corporations like Nexon—be able to cope with the fact that even a small design choice risks massive disruption of the in-game economy? Bigger and more established corporations (like Nexon) have more reserved resources to manage the risks and minimise the potential damage to their business. In contrast, emerging studios will likely struggle to navigate these difficult design choices or even comply with the bare minimum required by law (e.g., making probability disclosures or removing loot boxes [98, 100]) [86, 91].

Another alarming aspect is the worrying consequences of online harassment from the angered players directed both towards Nexon workers and between the players during the incident. Although our current study cannot verify the impact of the incidents on Nexon's worker's and player's mental health, it is fair to speculate that both may have experienced increased stress and decreased morale. For instance, the hearing session between Nexon and players that was live streamed on 11 April 2021 showed several moments of both *Maple Story* developers and players in visible distress (e.g., stuttering, cracking voice, deconcentration, and reacting emotionally). Moreover, Nexon workers who were first exposed to angered players (e.g., customer phone line, player relation, and quality assurance staff) were in one of the most vulnerable positions in the company, with the precarious conditions for their labour being less appreciated [11, 70, 74, 111] and them not being not directly consulted in relation to the company's business decisions. Therefore, it is important for these systematic issues to be addressed through collaborations between governments, industry, and academia so as to provide industry-wide safety nets for emerging game studios and vulnerable game workers. This would help ensure the economic and social sustainability of the game industry in the long run.

5 CONCLUSION

The player revolt against the randomisation and loot box systems implemented in *Maple Story* culminated in crowdfunding, media campaigns, and political rallies, including proxy demonstrations of truck protests that lasted for more than a month. It has also resulted in an estimated 400,000 Korean online game players' mass exodus from *Maple Story*, one of the longest-serving and most successful games in Korean history, which severely impacted the game company's business. This paper, therefore, reviewed the Maple Refugee player revolt incident that was started by Korean players of *Maple Story* (Nexon, 2003) in Spring 2021 and attempted to synthesise the lessons that could be learned by other video game markets beyond Far East Asia, such as how to better regulate and service video games.

While the paper serves as the first work to analyse the Maple Refugee case in English and apply it to a European game context, it also has limitations. Firstly, we only used secondary online sources (from the company, players, and media) relating to the incident, which may be incomplete and biased, thus affecting our interpretation. Future research may consider directly engaging with the stakeholders involved with the incident (e.g., interviewing *Maple Story* players and streamers and workers at Nexon). Secondly, certain factors involved with the incident might be unique to Korea. Further studies could take a comparative perspective and explore (dis)similar cases from other countries.

What is remarkable about the Maple Refugee incident is how *Maple Story* players united and mobilised within a matter of days and eventually pressured the game studio into disclosing probabilities relating to the game's core monetisation mechanics, which have been kept secret by the company for more than a decade since the game's release. The player activism also led to a new law that mandates loot box probability disclosure in South Korea from 22 March 2024 [69], demonstrating the power of players in affecting policy and enacting change. This case demonstrates the importance

of transparent communication by companies towards their players, and in particular that of making probability disclosures. How that is handled could either disrupt or uplift a game service. Game companies should be cautious with the management of their long-term game-as-a-service models, acknowledging that as the scale of the game's in-game market and monetisation increases—like it did in *Maple Story*—so does the company's responsibility to build trust with its players (including with streamers and high-spending players). The Maple Refugee incident also shows that streamers and high-spending players are two crucial social pillars that sway, escalate, and spread online opinions. On the game production side, the ever-growing complexity of monetisation systems, especially those involving real-money trading, presents higher risks and compliance costs. The more games become a service, the more companies should carefully monitor the game's market stability to 'satisfy' their players who have invested their real money. Therefore, we call for more comprehensive discussions, that take into account both player and industry perspectives, on how to establish and support sustainable game business practices.

ACKNOWLEDGMENTS

We would like to express our appreciation to Dr. Nick Ballou for his contributions of valuable insights and encouragement.

REFERENCES

[1] Brett Abarbanel. 2018. Gambling vs. gaming: a commentary on the role of regulatory, industry, and community stakeholders in the loot box debate. *Gaming Law Review* 22, 4 (2018), 231–234. https://doi.org/10.1089/glr2.2018.2243 Publisher: Mary Ann Liebert, Inc., publishers.

[2] Korea Creative Content Agency. 2023. *2022 | White Paper on Korean Games.* Technical Report.

[3] Heechan Ahn. 2011. 'Shutdown law' sparked small business to crumble leading to investment shortages. https://news.nate.com/view/20111226n22608?mid=n0606

[4] Kati Alha. 2020. *The Rise of Free-to-Play: How the revenue model changed games and playing.*

[5] Aniplex. 2015. Fate/Grand Order. https://www.fate-go.jp/ Korean live-service since 2017 by Netmarble; https://fgo.netmarble.com/.

[6] Electronic Arts and Nexon Korea. 2016. FIFA Mobile.

[7] Janarthanan Balakrishnan and Mark D. Griffiths. 2018. Loyalty towards online games, gaming addiction, and purchase intention towards online mobile in-game features. *Computers in Human Behavior* 87 (2018), 238–246. https://doi.org/10.1016/j.chb.2018.06.002

[8] Nick Ballou, Charles Gbadamosi, and David Zendle. 2022. The hidden intricacy of loot box design: A granular description of random mone-tized reward features. In *DiGRA"22 &ndash Proceedings of the 2022 DiGRA International Conference: Bringing Worlds Together.* http://www.digra.org/wp-content/uploads/digital-library/LB_features_Digra_final.pdf

[9] Brian C. Britt and Rebecca K. Britt. 2021. From waifus to whales: The evolution of discourse in a mobile game-based competitive community of practice. *Mobile Media & Communication* 9, 1 (Jan. 2021), 3–29. https://doi.org/10.1177/2050157920934509

[10] Justin Carter and 2023. 2023. Activision Blizzard fined €5000 by PEGI for Diablo Immortal loot boxes. https://www.gamedeveloper.com/business/activision-blizzard-fined-by-pegi-for-diablo-immortal-loot-boxes

[11] Aleena Chia. 2022. The artist and the automaton in digital game production. *Convergence* 28, 2 (April 2022), 389–412. https://doi.org/10.1177/13548565221076434

[12] Eunsang Choi. 2023. 20th Anniversary of Maple Story is hear - The secret behind the game's long-serving lifespan. https://www.gametoc.co.kr/news/articleView.html?idxno=72551

[13] Jiyun Choi, Hyunseok Cho, Seungmin Lee, Juyeong Kim, and Eun-Cheol Park. 2018. Effect of the Online Game Shutdown Policy on Internet Use, Internet Addiction, and Sleeping Hours in Korean Adolescents. *Journal of Adolescent Health* 62, 5 (May 2018), 548–555. https://doi.org/10.1016/j.jadohealth.2017.11.291

[14] James Close, Stuart Gordon Spicer, Laura Louise Nicklin, Maria Uther, Joanne Lloyd, and Helen Lloyd. 2021. Secondary analysis of loot box data: Are high-spending "whales" wealthy gamers or problem gamblers? *Addictive Behaviors* 117 (June 2021), 106851. https://doi.org/10.1016/j.addbeh.2021.106851

[15] Korea Fair Trade Commission. 2018. Case: Nexon Korea Co., Ltd.'s violation of the Electronic Commerce Consumer Protection Act. Decision no.2018-152.

[16] Korea Fair Trade Commission. 2018. *Case: Violation of the Electronic Commerce Act by three companies, including Netmarble Games Co., Ltd.* Technical Report 20180402. Korea Fair Trade Comission, Electronic Commerce Department. Case no.2017Electronic0209.

[17] Mia Consalvo and Christopher A. Paul. 2018. 'If you are feeling bold, ask for $3': Value Crafting and Indie Game Developers. *Transactions of the Digital Games Research Association* 4, 2 (2018). https://doi.org/10.26503/todigra.v4i2.89 Number: 2.

[18] Mia Consalvo and Christopher A. Paul. 2019. *Real Games: What's Legitimate and What's Not in Contemporary Videogames.* MIT Press.

[19] Seoul High Court. 2019. Seoul High Court 2019.8.29. Sentencing 2018 NU53070 verdict. https://legalengine.co.kr/cases/CLvo9T0MrhEmaej8sa5gqQ

[20] Amalia Creus, Judith Clares-Gavilán, and Jordi Sánchez-Navarro. 2020. What's your game? Passion and precariousness in the digital game industry from a gameworker's perspective. *Creative Industries Journal* 13, 3 (2020), 196–213. https://doi.org/10.1080/17510694.2019.1685302

[21] Myriam Davidovici-Nora. 2013. Innovation in business models in the video game industry: Free-To-Play or the gaming experience as a service. *The Computer Games Journal* 2, 3 (Dec. 2013), 22–51. https://doi.org/10.1007/BF03392349

[22] Myriam Davidovici-Nora. 2014. Paid and Free Digital Business Models Innovations in the Video Game Industry. *Digiworld Economic Journal* 94, 2 (June 2014), 83.

[23] Pieterjan Declerck and Nadia Feci. 2022. *Mapping and analysis of the current regulatory framework on gambling(-like) elements in video games.* Technical Report.

[24] Paul Delfabbro and Daniel King. 2015. On finding the C in CBT: the challenges of applying gambling-related cognitive approaches to video-gaming. *Journal of Gambling Studies* 31, 1 (March 2015), 315–329.

[25] Maarten Denoo, Bruno Dupont, Bieke Zaman, Eva Grosemans, and Steven Malliet. 2023. Making Complexity Measurable in Practice: A Formal Analysis of Gamble-Play media. *Games and Culture* (May 2023). https://doi.org/10.1177/15554120231175615

[26] Mark Deuze, Chase Martin, and Christian Allen. 2007. The Professional Identity of Gameworkers. *Convergence: The International Journal of Research Into New Media Technologies* 13 (2007), 335–353. https://doi.org/10.1177/1354856507081947

[27] Aaron Drummond and James D. Sauer. 2018. Video game loot boxes are psychologically akin to gambling. *Nature Human Behaviour* 2, 8 (2018), 530–532. https://doi.org/10.1038/s41562-018-0360-1

[28] Louis-Etienne Dubois and Johanna Weststar. 2022. Games-as-a-service: Conflicted identities on the new front-line of video game development. *New Media & Society* 24, 10 (Oct. 2022), 2332–2353. https://doi.org/10.1177/1461444821995815

[29] Nick Dyer-Witheford and Greig De Peuter. 2009. *Games of Empire: Global Capitalism and Video Games.* University of Minnesota Press.

[30] Nick Dyer-Witheford and Greig De Peuter. 2021. Postscript: Gaming While Empire Burns. *Games and Culture* 16, 3 (May 2021), 371–380. https://doi.org/10.1177/1555412020954998

[31] Ahmed Elmezeny. 2021. *The Complete Cost of Play: An Ethnography of Commercialization in Free-to-Play Game Culture.* Cuvillier Verlag.

[32] Blizzard Entertainment. 2022. Diablo Immortal.

[33] UK Government. 2022. *Consultation outcome: Government response to the call for evidence on loot boxes in video games.* Technical Report. Government Digital Service, United Kingdom. https://www.gov.uk/government/consultations/loot-boxes-in-video-games-call-for-evidence/outcome/government-response-to-the-call-for-evidence-on-loot-boxes-in-video-games

[34] GSOK. 2018. *Self-regulatory enforcement standards for a healthy game culture.* Technical Report. Game Self-governance Organization of Korea. http://www.gsok.or.kr/?kboard_content_redirect=89

[35] Juho Hamari and Max Sjöblom. 2017. What is eSports and why do people watch it? *Internet Research* 27, 2 (Jan. 2017), 211–232. https://doi.org/10.1108/IntR-04-2016-0085

[36] William A. Hamilton, Oliver Garretson, and Andruid Kerne. 2014. Streaming on Twitch: Fostering Participatory Communities of Play within Live Mixed Media. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '14).* Association for Computing Machinery, New York, NY, USA, 1315–1324. https://doi.org/10.1145/2556288.2557048 event-place: Toronto, Ontario, Canada.

[37] Oliver Hinz, Martin Spann, and Il-Horn Hann. 2010. Prestige Goods and Social Status in Virtual Worlds. *ICIS 2010 Proceedings - International Conference on Information systems.* (Jan. 2010), 190. https://aisel.aisnet.org/icis2010_submissions/190

[38] Dal Young Jin. 2010. *Korea's Online Gaming Empire.* MIT Press. https://books.google.dk/books?id=H21v3d-ErXMC

[39] Hui-Seon Jo and Seoung-Ho Ryu. 2019. Critical analysis about the game self-regulation bill: A study about the structure and regulation of Double loot box. *Journal of Korea Game Society* 4 (Aug. 2019), 49–64. https://doi.org/10.7583/

JKGS.2019.19.4.49
[40] Mark R. Johnson and Jamie Woodcock. 2018. Conversation, Discourse and Play: Interaction and Moderation in Twitch.tv Live Streaming. In *DiGRA '18 – Abstract Proceedings of the 2018 DiGRA International Conference: The Game is the Message*. DiGRA.
[41] Faltin Karlsen. 2011. Theorycrafting: from collective intelligence to intrinsic satisfaction. In *DiGRA'11 - Proceedings of the 2011 DiGRA International Conference: Think Design Play*. http://www.digra.org/wp-content/uploads/digital-library/11301.06109.pdf
[42] Brendan Keogh. 2023. *The Videogame Industry Does Not Exist: Why We Should Think Beyond Commercial Game Production* (1 ed.). The MIT Press. https://doi.org/10.7551/mitpress/14513.001.0001
[43] Aphra Kerr. 2017. *Global Games: Production, Circulation and Policy in the Networked Era*. Taylor & Francis.
[44] Jaeseok Kim. 2021. Mabinogi truck protesters point out "political game misunderstanding" through parliamentary inspection. https://www.thisisgame.com/webzine/news/nboard/4/?n=135190
[45] Joohwuan Kim. 2022. Kartrider game players are now doing truck protests against Nexon's sudden closer of the game's service. https://www.yna.co.kr/view/AKR20221222111100017
[46] Jae-hoon Kim and Ki-joo Shin. 2015. *PLAY: From gamer kids to global corporation, the story of Nexon's people* (1 ed.). Minumsa.
[47] Keunwook Kim. 2021. '0 won challenge' is hitting Nexon, and it's hitting hard. High-spenders have locked their wallets. https://www.news1.kr/articles/4221053
[48] Seungjoo Kim. 2022. No truck, but a horse wagon. South Korean gamers protest against Uma musume Pretty Derby. https://www.thisisgame.com/webzine//nboard/4/?outkey=zkcaebvn6rxg3m4ur1382qdqd9zmwy9fq8s438tf&page=22&n=156801
[49] Sungjoo Kim. 2023. Exploded anger of gamers led to legalization of probability disclosure. https://www.thisisgame.com/webzine/news/nboard/11/?amp;n=58699&page=3&n=168306
[50] Annakaisa Kultima. 2018. *Game Design Praxiology*. Doctoral dissertation. Tampere University. https://trepo.tuni.fi/handle/10024/103315
[51] Deirdre Leahy. 2022. Rocking the Boat: Loot Boxes in Online Digital Games, the Regulatory Challenge, and the EU's Unfair Commercial Practices Directive. *Journal of Consumer Policy* 45, 3 (Sept. 2022), 561–592. https://doi.org/10.1007/s10603-022-09522-7
[52] Doohyun Lee. 2022. 2021 was the year of 'Lost Ark', operating profit increased by 4419%. https://www.inven.co.kr/webzine/news/?news=270577
[53] Dong-Eun Lee and You-Ho Lee. 2015. A Study on the Free-to-Play Model for Digital Games. *Journal of Korea Game Society* 15, 6 (2015), 107–120. https://doi.org/10.7583/JKGS.2015.15.6.107 Publisher: Korea Game Society.
[54] Hyunsoo Lee. 2021. Gamers are turning against the game companies. From truck protests to a petition to the national assembly. https://www.etnews.com/20210219000057
[55] Junghen Lee. 2022. Korean games in the time of difficulties. Can they fly again? https://magazine.hankyung.com/business/article/202202234826b
[56] Sang-heon Lee. 2020. Proposal for All amendments to the Game Industry Promotion Act. https://likms.assembly.go.kr/bill/billDetail.do?billId=PRC_E2I0I1I2R1N4M1C5J5H2O3E3R4M1O3
[57] Nexon Ltd. 2023. Nexon - IR releases. https://ir.nexon.co.jp/en/
[58] Zhicong Lu, Haijun Xia, Seongkook Heo, and Daniel Wigdor. 2018. You Watch, You Give, and You Engage: A Study of Live Streaming Practices in China. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18)*. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3173574.3174040
[59] Joseph Macey and Juho Hamari. 2020. GamCog: A measurement instrument for miscognitions related to gamblification, gambling, and video gaming. *Psychology of Addictive Behaviors: Journal of the Society of Psychologists in Addictive Behaviors* 34, 1 (Feb. 2020), 242–256. https://doi.org/10.1037/adb0000526
[60] Joseph Macey and Juho Hamari. 2022. Gamblification: A definition. *New Media & Society* (March 2022). https://doi.org/10.1177/14614448221083903 Publisher: SAGE Publications.
[61] Torill Elvira Mortensen. 2010. Training, Sharing or Cheating? Gamer Strategies to Get a Digital Upper Hand. *E-Learning and Digital Media* 7, 1 (2010), 79–89. https://doi.org/10.2304/elea.2010.7.1.79
[62] Torill Elvira Mortensen. 2018. Anger, Fear, and Games: The Long Event of #GamerGate. *Games and Culture* 13, 8 (2018), 787–806. https://doi.org/10.1177/1555412016640408
[63] Peter Naessens. 2018. Research report on loot boxes. *Belgian Gaming Commission* (2018). Dostupnona:https://www.gamingcommission.be/opencms/export/sites/default/jhksweb_nl/documents/onderzoeksrapport-loot-boxen-Engels-publicatie.pdf
[64] NCsoft. 2017. LineageM. https://lineagem.plaync.com/
[65] Nexon. 2003. Maple Story. https://maplestory.nexon.com/ Studio: Wizet.
[66] Nexon. 2008. Counter-Strike Online.
[67] David B. Nieborg. 2015. Crushing Candy: The Free-to-Play Game in Its Connective Commodity Form. *Social Media + Society* 1, 2 (July 2015), 2056305115621932. https://doi.org/10.1177/2056305115621932
[68] South Korean Ministry of Gender Equality and Family. 2022. Youth Proection Act. https://www.law.go.kr/LSW/eng/engLsSc.do?menuId=2&section=lawNm&query=adolscent&x=0&y=0#liBgcolor3
[69] National Assembly of South Korea. 2023. Game Industry Promotion Act. https://www.law.go.kr/
[70] Anna Ozimek. 2021. Supporting the Global Digital Games Industry: Outsourcing Games Production in Poland and Estonia. In *Topologies of Digital Work: How Digitalisation and Virtualisation Shape Working Spaces and Places*, Mascha Will-Zocholl and Caroline Roth-Ebner (Eds.). Springer International Publishing, Cham, 51–76. https://doi.org/10.1007/978-3-030-80327-8_3
[71] Guang-seok Park. 2021. Interview with the Maple Story player task force team behind the truck protests. https://m.inven.co.kr/webzine/wznews.php?idx=252666
[72] Soyeon Park. 2014. Small and medium-sized businesses are concerned over the government's proposal to update the Shutdown Law. Here's why. https://zdnet.co.kr/view/?no=20140902103101
[73] Solip Park, Nick Ballou, Maarten Denoo, Eva Grosemans, Elena Petrovskaya, Yaewon Jin, and Leon Y. Xiao. 2023. Learnings from the case Maple Refugee: A story of free-to-play, probability, and gamer consumer activism. In *DiGRA'23 - Extended Abstracts on the 2023 DiGRA International Conference*. Digital Games Research Association, Seville, Spain.
[74] Solip Park, Annakaisa Kultima, Miikka J. Lehtonen, and Jeanine Krath. 2022. Everywhere but Nowhere: Development Experiences of the International Game Developers in Finland during the Covid-19 Pandemic and Remote Work. *Proceedings of the ACM on Human-Computer Interaction* 6, CHI PLAY (2022), 233:1–233:14. https://doi.org/10.1145/3549496
[75] Christopher A. Paul. 2011. Optimizing Play: How Theorycraft Changes Gameplay and Design. *Game Studies* 11 (2011).
[76] Christopher A. Paul. 2020. *Free-to-Play: Mobile Video Games, Bias, and Norms*. MIT Press.
[77] Matthew E. Perks. 2021. Regulating In-Game Monetization: Implications of Regulation on Games Production. *Game production studies* (2021), 217.
[78] Elena Petrovskaya and David Zendle. 2022. Predatory Monetisation? A Categorisation of Unfair, Misleading and Aggressive Monetisation Techniques in Digital Games from the Player Perspective. *Journal of Business Ethics* 181, 4 (Dec. 2022), 1065–1081. https://doi.org/10.1007/s10551-021-04970-6
[79] Luke Plunkett. 2022. Dude Spends $6,000 On Diablo Immortal, Gets No 5-Star Legendary Gems. https://kotaku.com/diablo-immortal-gems-legendary-spend-economy-loot-box-b-1849043437
[80] Mike Rose. 2013. Chasing the Whale: Examining the ethics of free-to-play games. https://www.gamedeveloper.com/business/chasing-the-whale-examining-the-ethics-of-free-to-play-games
[81] Ji-yeon Shin, Jung-seok Lee, Young-seong Ho, and Eun-jae Lee. 2022. *Korean MZ Generation Game Usage Behavior Report 2022*. Technical Report IR2022-01. 20slab. https://www.20slab.org/Archives/38142
[82] Smilegate. 2018. Lost Ark. https://lostark.game.onstove.com/
[83] Olli Sotamaa and Jan Švelch (Eds.). 2021. *Game Production Studies* (1 ed.). Amsterdam University Press.
[84] Stuart Gordon Spicer, Chris Fullwood, James Close, Laura Louise Nicklin, Joanne Lloyd, and Helen Lloyd. 2022. Loot boxes and problem gambling: Investigating the "gateway hypothesis". *Addictive Behaviors* 131 (2022), 107327. https://doi.org/10.1016/j.addbeh.2022.107327
[85] EA Sports. 2022. FIFA 23.
[86] Sam Srauy. 2019. Precarity and Why Indie Game Developers Can't Save Us from Racism. *Television & New Media* 20, 8 (2019), 802–812. https://doi.org/10.1177/1527476419851081 Publisher: SAGE Publications.
[87] Paul Tassi. 2022. 'Diablo Immortal' Player Spends $100K To Max His Character, Now Too Powerful To Matchmake. https://www.forbes.com/sites/paultassi/2022/08/07/diablo-immortal-player-spends-100k-to-max-his-character-now-too-powerful-to-matchmake/
[88] Anonymous user. 2021. 3rd Maple Story player public statement and fundraising for truck protest. https://www.inven.co.kr/board/maple/2299/6380281
[89] Anonymous user. 2021. Maple Story player public statement - 2nd revision. https://www.inven.co.kr/board/maple/2299/6319399
[90] Karin Wenz. 2013. Theorycrafting. *Information, Communication & Society* 16, 2 (March 2013), 178–193. https://doi.org/10.1080/1369118X.2012.738695
[91] Jennifer R Whitson, Bart Simon, and Felan Parker. 2018. The Missing Producer: Rethinking indie cultural production in terms of entrepreneurship, relational labour, and sustainability. *European Journal of Cultural Studies* (2018). https://doi.org/10.1177/1367549418810082
[92] Ulf Wilhelmsson, Wei Wang, Ran Zhang, and Marcus Toftedahl. 2022. Shift from game-as-a-product to game-as-a-service research trends. *Service Oriented Computing and Applications* 16, 2 (June 2022), 79–81. https://doi.org/10.1007/s11761-022-00335-7

[93] Hayley Williams. 2021. Minecraft Gets A 19+ Age Restriction In South Korea. https://www.gamespot.com/articles/minecraft-gets-a-19-age-restriction-in-south-korea/1100-6493636/

[94] Jamie Woodcock and Mark R. Johnson. 2019. The Affective Labor and Performance of Live Streaming on Twitch.tv. *Television & New Media* 20, 8 (2019), 813–823. https://doi.org/10.1177/1527476419851077 Publisher: SAGE Publications.

[95] Orlando Woods. 2022. The affective embeddings of gacha games: Aesthetic assemblages and the mediated expression of the self. *New Media & Society* (Jan. 2022), 14614448211067756. https://doi.org/10.1177/14614448211067756

[96] Leon Y. Xiao. 2022. Drafting video game loot box regulation for dummies: a Chinese lesson. *Information & Communications Technology Law* 31, 3 (Sept. 2022), 343–381. https://doi.org/10.1080/13600834.2022.2088062 Publisher: Routledge.

[97] Leon Y. Xiao. 2023. Beneath the label: unsatisfactory compliance with ESRB, PEGI and IARC industry self-regulation requiring loot box presence warning labels by video game companies. *Royal Society Open Science* 10, 3 (March 2023), 230270. https://doi.org/10.1098/rsos.230270

[98] Leon Y. Xiao. 2023. Breaking Ban: Belgium's Ineffective Gambling Law Regulation of Video Game Loot Boxes. *Collabra: Psychology* 9, 1 (Jan. 2023), 57641. https://doi.org/10.1525/collabra.57641

[99] Leon Y. Xiao and Pieterjan Declerck. 2023. Paid Video Game Loot Boxes are Not Gambling Under Dutch Gambling Regulation? Shifting the Goalpost in Electronic Arts V Kansspelautoriteit. https://doi.org/10.2139/ssrn.4346122

[100] Leon Y. Xiao, Laura L. Henderson, and Philip Newall. 2021. What are the odds? Lower compliance with Western loot box probability disclosure industry self-regulation than Chinese legal regulation. https://doi.org/10.2139/ssrn.3934941

[101] Leon Y. Xiao, Laura L. Henderson, and Philip W. S. Newall. 2022. Loot boxes are more prevalent in United Kingdom video games than previously considered: updating Zendle et al. (2020). *Addiction* 117, 9 (2022), 2553–2555. https://doi.org/10.1111/add.15829

[102] Leon Y. Xiao, Laura L. Henderson, Yuhan Yang, and Philip W. S. Newall. 2021. Gaming the system: suboptimal compliance with loot box probability disclosure regulations in China. *Behavioural Public Policy* (July 2021), 1–27. https://doi.org/10.1017/bpp.2021.23

[103] Dong-soo Yoo. 2021. Proposal for Partial Amendment to the Game Industry Promotion Act. https://likms.assembly.go.kr/bill/billDetail.do?billId=PRC_K2K1C0Q3B0P3M1V0R3Z6K3B1G1Z9K6

[104] Seoho Yoon. 2021. Fate/Grand Order incident. Players say they shall no longer lying flat. https://www.inven.co.kr/webzine/news/?news=249914

[105] Seoho Yoon. 2021. Lost Ark's number of users increased by 306%. https://www.inven.co.kr/webzine/news/?news=253672

[106] Eun Yu, Chanyong Jung, Hyungjin Kim, and Jaemin Jung. 2018. Impact of viewer engagement on gift-giving in live video streaming. *Telematics and Informatics* 35, 5 (2018), 1450–1460. https://doi.org/10.1016/j.tele.2018.03.014

[107] David Zendle. 2020. How do loot boxes make money? An analysis of a very large dataset of real Chinese CSGO loot box openings. https://doi.org/10.31234/osf.io/5k2sy

[108] David Zendle and Paul Cairns. 2018. Video game loot boxes are linked to problem gambling: Results of a large-scale survey. *PLOS ONE* 13, 11 (2018). https://doi.org/10.1371/journal.pone.0206767

[109] David Zendle, Paul Cairns, Rachel Meyer, Stuart Waters, and Nick Ballou. 2022. Response to Xiao et al.: If everything is a loot box, nothing is. *Addiction* 117, 9 (2022), 2555–2556. https://doi.org/10.1111/add.15976

[110] Franziska Zimmer and Katrin Scheibe. 2019. What Drives Streamers? Users' Characteristics and Motivations on Social Live Streaming Services. https://doi.org/10.24251/HICSS.2019.306

[111] Jan Švelch. 2021. Developer Credit: Para-Industrial Hierarchies of In-Game Credit Attribution in the Video Game Industry. *Games and Culture* (2021), 15554120211034408. https://doi.org/10.1177/15554120211034408