2022
WHITE PAPER
ON KOREAN GAMES

SUMMARY

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Introduction

In 2021, the domestic gaming market was worth KRW 20.9913 trillion, reflecting an 11.2% increase from KRW 18.8855 trillion in 2020. The domestic gaming industry had steadily grown over the last 10 years, except when it recorded a 0.3% decrease in 2013. It increased by 11.2% in 2021, compared to the previous year.

In terms of game production and distribution companies, based on sales in 2021, mobile gaming accounted for KRW 12.1483 billion(market share: 57.9%), which is the largest share of the entire gaming market this year following the previous year. PC gaming amounted to KRW 5.6373 trillion(market share: 26.8%), showing a slight increase compared to last year, and sales increased by 15.0% compared to the previous year.

Considering other platform games, console gaming had a market share of 5.0% and sales of KRW 1.52 trillion(3.7% drop), both of which decreased slightly compared to the previous year. The market share of arcade gaming was 1.3%, a slight increase compared to the previous year, and sales increased by 20.3% compared to the previous year to KRW 273.3 billion. Next, sales of computer game room operating business(PC bangs) increased slightly to KRW 1.8408 trillion from the previous year, but market share decreased slightly from the previous year to 8.8%. Gaming arcades had a market share of 0.2%, the same as the previous year, but sales slightly increased to KRW 39.6 billion.

The growth rate by sector increased year-on-year in general, but console gaming decreased slightly. First, in game production and distribution businesses, PC gaming, mobile gaming, and arcade gaming increased by 15.0%, 12.2%, and 20.3%, respectively, while console gaming decreased by 3.7%. PC bangs and gaming arcades increased by 2.4% and 8.6%, respectively.

In 2021, domestic gaming industry exports amounted to USD 8.67287 billion, a 5.8% increase from the previous year. Applying the 2021 average annual won-dollar exchange rate(sale standard rate) of KRW 1,144.42, as the Bank of

Korea announced, it is worth about KRW 9,925.4 billion. Imports were worth USD 312.33 million, a 15.3% increase from the previous year, equivalent to about KRW 357.4 billion.

The following outlines the key status of the domestic gaming industry and several issues affecting it.

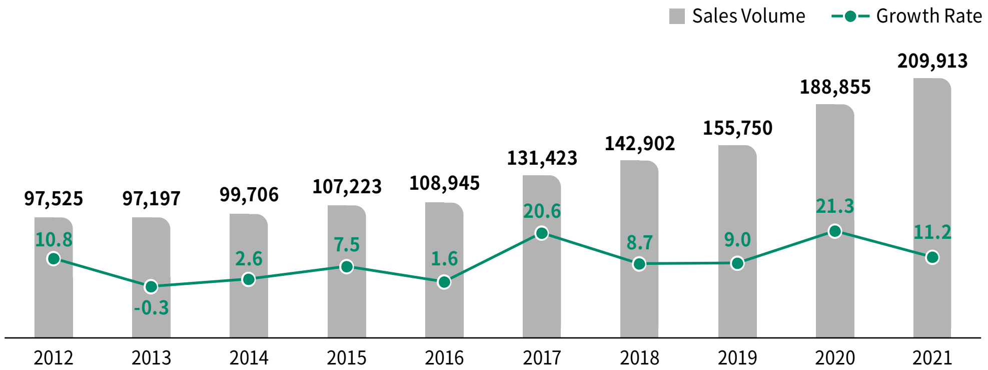
Part 1 Gaming Industry Trends in 2021

1) A 11.2% YoY growth in the domestic gaming market in 2021, amounting to KRW 20.9913 trillion in sales

In 2021, the size of the domestic gaming market was worth KRW 20.9913 trillion, an 11.2% increase compared to KRW 18.8855 trillion in 2020. The domestic gaming industry has been steadily growing in the past 10 years, except in 2013 when the market slightly slowed down. Despite market contraction due to COVID-19 in 2020, it grew by 11.2%, and the market size exceeded 20 trillion won for the first time.

Figure 1 Total Size and Growth Rate of the Domestic Gaming Market(2012~2021)

(Unit: KRW 100 mil., %)



2) The mobile gaming market amounts to KRW 12.1483 trillion, making up 57.9% of the total gaming industry sales

Now that high-quality games could be enjoyed easily anytime and anywhere with convenient accessibility to mobile devices and improvement in hardware specifications, the mobile gaming market steadily grew. In 2021, despite the increase in outdoor activities following the reduction of COVID-19, the market size of the mobile gaming market amounted to KRW 12.1483 trillion. This accounts for 57.9% of the total share of the domestic gaming industry, proving that mobile games are still a major axis of the domestic game market.

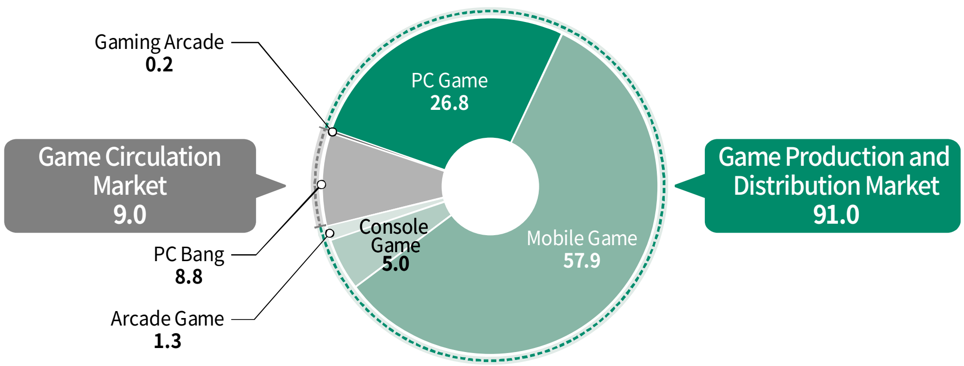
Console gaming sales in 2021 amounted to KRW 1.520 trillion, a 3.7% YoY drop, with a market share of 5.0%. Console gaming sales dropped due to the lack of popular games, such as < Animal Crossing: New Horizons> in 2020.

PC gaming and arcade gaming market sales increased by 15.0% and 20.3%, respectively, while their market shares increased by 0.9%p and 0.1%p, respectively, from the previous year. The market share of PC gaming in 2021 was 26.8%, while that of arcade gaming was 1.3%.

On the other hand, game circulation businesses, such as PC bangs and gaming arcades, have been recovering from the effects of COVID-19. PC bang sales were recorded at KRW 1.8408 trillion, a 2.4% increase from the previous year, while that of gaming arcade sales reached KRW 39.6 billion, an 8.6% increase of the prior year. The market share of PC bangs in 2021 was 8.8%, and that of gaming arcades was 0.2%.

Figure 2 Domestic Gaming Market Share by Field

(Unit: %)



3) Domestic game market growth expected to continue in the future

The size of the domestic gaming market in 2022 is expected to increase by approximately 8.5%, compared to 2021, and to amount to KRW 22.7723 trillion in value. As the impact of COVID-19 lessens, the game production and distribution markets are expected to continue to grow, focusing on mobile and arcade games. Moreover, circulation market, such as PC bangs and gaming arcades, is expected to continue its recovery while preparing for the endemic stage of COVID-19.

In 2022, the size of the PC gaming market is expected to decrease by 0.2%, compared to 2021, and to amount to KRW 5.6238 trillion in value. In the case of PC games, although new games are scheduled to be released one after another, it is expected to decrease slightly given that they grew significantly in 2021, considering the time difference before sales are reflected in the market. PC bangs are expected to steadily recover and record growth following 2021 as social distancing rules are eased. The mobile gaming market is expected to reach KRW 13.8559 trillion in sales in 2022, up 14.1% from the previous year due to its excellent accessibility and successive box-office hits.

Table 1 Scale and Prospect of the Domestic Gaming Market(2020~2024)

(Unit: KRW 100 mil, %)

Type	2020		2021		2022(E)		2023(E)		2024(E)	
	Sales Volume	Growth Rate	Sales Volume	Growth Rate	Sales Volume	Growth Rate	Sales Volume	Growth Rate	Sales Volume	Growth Rate
PC Game	49,012	2.0	56,373	15.0	56,238	-0.2	54,789	-2.6	57,634	5.2
Mobile Game	108,311	39.9	121,483	12.2	138,559	14.1	150,891	8.9	164,489	9.0
Console Game	10,925	57.3	10,520	-3.7	10,078	-4.2	10,376	3.0	11,160	7.6
Arcade Game	2,272	1.6	2,733	20.3	3,030	10.9	3,283	8.3	3,604	9.8
PC Bang	17,970	-11.9	18,408	2.4	19,192	4.3	21,015	9.5	20,883	-0.6
Gaming Arcade	365	-48.1	396	8.6	625	57.6	816	30.6	808	-1.0
Total	188,855	21.3	209,913	11.2	227,723	8.5	241,170	5.9	258,578	7.2

The console gaming market showed a decrease of 3.7% compared to the previous year due to the absence of killer content. Sales of the console gaming market in 2022 are expected to record KRW 1.0078 trillion, down 4.2% from the previous year, but are expected to recover from 2023.

Meanwhile, the arcade game production and distribution business, and the gaming arcades that have been reduced due to COVID-19 are expected to grow by 10.9% and 57.6% YoY, approaching pre-COVID-19 market sales due to the lifting of social distancing rules.

4) Exports in 2021 amounting to USD 8.67287 billion, with a 5.8% YoY increase

In 2021, the domestic gaming industry's exports increased by 5.8% YoY, amounting to USD 8.67287 billion. If the 2021 annual sales standard of KRW 1,144.42 based on the KRW-USD exchange rate, which the Bank of Korea announced, is applied, it is approximately equivalent to KRW 9.9254 trillion. The import value also increased by 15.3%, amounting to USD 312.33 million, which is about KRW 357.4 billion.

Table 2 Export Status of the Domestic Gaming Industry(Last 7 Years)

(Unit: USD 1,000, %)

Type		2015	2016	2017	2018	2019	2020	2021
Export	Export Amount	3,214,627	3,277,346	5,922,998	6,411,491	6,657,777	8,193,562	8,672,865
	Rate of Change	8.1	2.0	80.7	8.2	3.8	23.1	5.8

Table 3 Import Status of the Domestic Gaming Industry(Last 7 Years)

(Unit: USD 1,000, %)

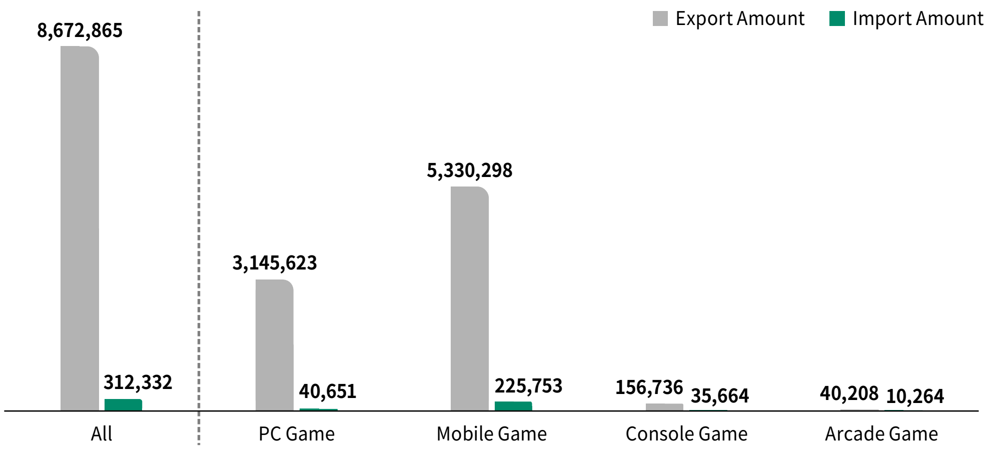
Type		2015	2016	2017	2018	2019	2020	2021
Import	Import Amount	177,492	147,362	262,911	305,781	298,129	270,794	312,332
	Rate of Change	7.2	-17.0	78.4	16.3	-2.5	-9.2	15.3

Among all the gaming platforms, the export scale of mobile games was the largest, worth USD 5.33030 billion. Next, the export scale of PC games amounted to USD 3.14562 billion. The export scale of console games amounted to USD 156.73 million, while that of arcade games amounted to USD 40.21 million.

In terms of import scale, PC gaming sales totaled USD 40.65 million in 2021, a 23.8% drop from the previous year. As of 2021, the arcade gaming platform generated the highest growth, USD 102.64 million in imports, an increase of 264.1% YoY. Mobile gaming related imports were worth about USD 22.575 million, while that of console gaming was about USD 35.66 million.

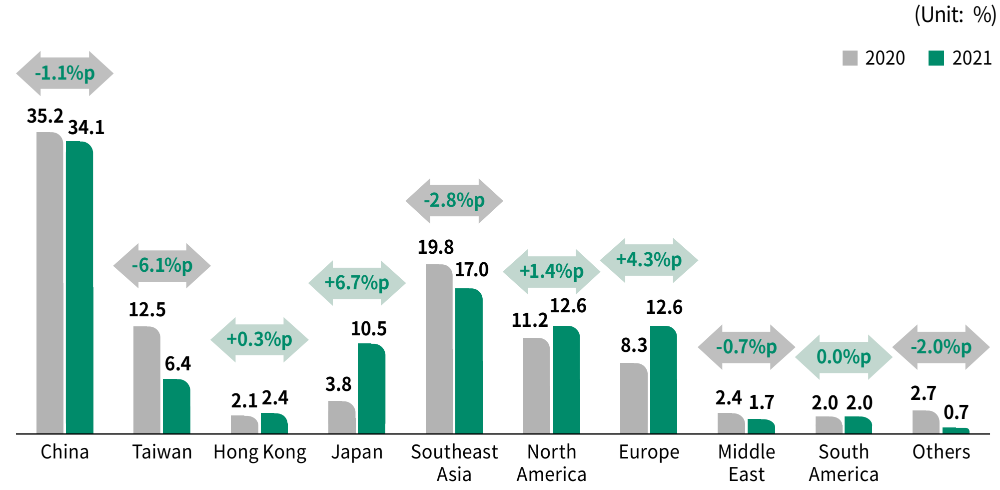
Figure 3 2021 Export/Import Scale by Domestic Gaming Platform

(Unit: USD 1,000)



In terms of the share of domestic gaming exports by country and region in 2021, the share of "China" was highest at 34.1%. This was followed by "Southeast Asia" with 17.0%, and "North America" and "Europe" with 12.6% each. Comparing it to the previous year, the export share to "Japan" increased by 6.7%p, while exports to "Taiwan" and "Southeast Asia" decreased by 6.1%p and 2.8%p, respectively.

Figure 4 Comparison of the Share of Domestic Gaming Exports by Country(2020~2021)



In terms of the share of domestic gaming exports by country and region in 2021, the share of "China" was highest at 44.0% for PC gaming exports. This was followed by "Europe"(20.5%) and "North America"(12.3%). The share of exports to "China"(-1.0%p), "Taiwan"(-10.6%p), "Hong Kong"(-0.4%p), "Middle East"(0.9%p), "South America"(0.8%p), and "Others"(-20.0%p) decreased, while those of "Japan"(+6.6%p), "Southeast Asia"(+0.3%p), "North America"(+3.3%p), and "Europe"(6.5%p) increased.

For mobile gaming exports, the share of "China" was highest at 29.2%, followed by the share of "Southeast Asia"(24.3%), "North America"(12.7%), "Japan"(10.5%), "Europe"(7.9%), etc. In comparison with 2020 figures, the shares of exports to "China"(-1.6%p), "Taiwan"(-3.7%p), and "Southeast Asia"(-4.4%p) decreased, while those of "Hong Kong"(+0.6%p), "Japan"(+7.0%p), "North America"(+0.5%p), "Europe"(+2.8%p), and "South America"(+0.6%p) increased.

5) Korea possesses a 7.6% share of the global market

Through comparison by country as of 2021, Korea accounted for a 7.6% share of the global gaming market. Korea ranked in 4th place after the US, China, and Japan, ranking the same as the previous year. Countries ranked from fifth to tenth places included the UK, Germany, France, Italy, Canada, and Taiwan, respectively. The rankings from 1 to 9 are the same as in 2020, but the 10th place has been changed from Spain to Taiwan.

In terms of platforms, as of 2021, Korea ranked third after China and the US, with a 13.2% market share. In 2021, Korea ranked fourth with a 10.6% share of the global mobile gaming market, as it was in the previous year. The top three countries in the 2021 global mobile gaming market were China, the US, and Japan with the shares of 28.2%, 16.9%, and 11.8%, respectively.

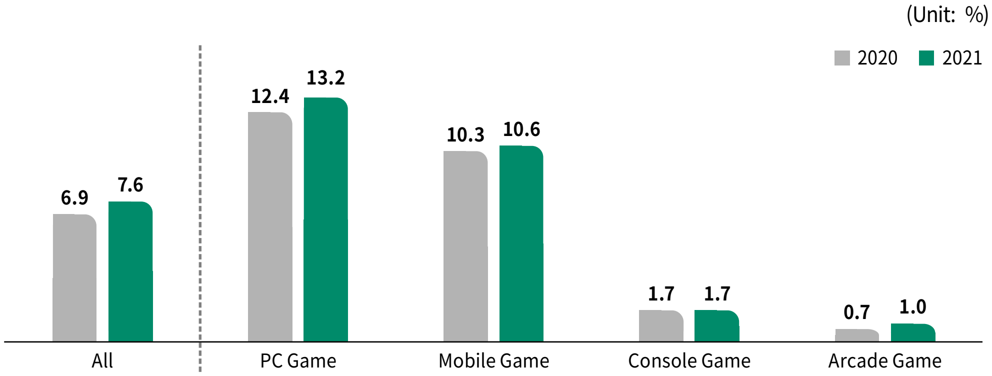
On the other hand, the shares of Korean console gaming and arcade gaming in the global market were 1.7% and 1.0%, respectively. However, in the case of arcade gaming, the global market share increased by 0.3%p in 2020 from 0.7%, a slight increase from the previous year.

Table 4 2021 Share of the Domestic Gaming Market in the Global Market(Based on Sales Volume)

(Unit: USD 1 mil. %)

Type	PC Game	Mobile Game	Console Game	Arcade Game	All
Global Gaming Market	37,243	100,234	55,140	27,142	219,758
Domestic Gaming Market	4,926	10,615	919	273	16,734
Market Share	13.2	10.6	1.7	1.0	7.6

Figure 5 Comparison of the Domestic Gaming Market Share in the Global Market



6) A total of 1,170 production/distribution companies, 9,265 PC bangs, 556 gaming arcades, and 81,856 workers

As of 2021, there were 1,170 game production and distribution companies. It was also estimated that there were 9,265 PC bangs and 556 gaming arcades. The total number of workers in the gaming industry in 2021 stood at 81,856, a 1.7% decrease compared to 83,303 workers in 2020. The number of workers in the game production and distribution business reached 45,262, making up 55.3% of the total number of workers. In contrast, the number of workers in the game circulation business stood at 36,594, making up 44.7% of the total number of workers.

The number of workers in the game production and distribution business in 2021 increased by 2.1% from the previous year. The number of workers increased across all gaming platforms, except for the PC gaming platform. The arcade game sector increased significantly by 22.1%, compared to the previous year. The number of workers in the game circulation business(PC bang and gaming arcade) decreased by 6.2% YoY, as the economy has not fully recover from the effects of business restrictions due to COVID-19. The number of workers in the PC bang business decreased by 6.3%, but that of gaming arcades increased by 2.0% YoY. The number of workers in the gaming industry decreased by 1.7% compared to the previous year. However, the number of workers in the game production and distribution businesses surpassed the number of workers in the game circulation business following 2020.

Table 5 Number of Gaming Industry Workers(2019~2021)

(Unit: Person, %)

Type		2019	2020	2021	2021 Composition	YoY Rate from 2020
Game Production & Distribution	PC Game	13,430	14,600	13,124	16.0	-10.1p
	Mobile Game	23,057	27,028	29,015	35.5	7.4p
	Console Game	1,348	1,110	1,204	1.5	8.5p
	Arcade Game	1,555	1,572	1,919	2.3	22.1p
	Subtotal	**39,390**	**44,310**	**45,262**	**55.3**	**2.1p**

Type		2019	2020	2021	2021 Composition	YoY Rate from 2020
Game Circulation	PC Bang	48,810	38,154	35,738	43.7	-6.3p
	Gaming Arcade	957	839	856	1.0	2.0p
	Subtotal	**49,767**	**38,993**	**36,594**	**44.7**	**-6.2p**
Total		89,157	83,303	81,856	100.0	-1.7p

7) The global gaming market in 2021 grew by 8.7% YoY

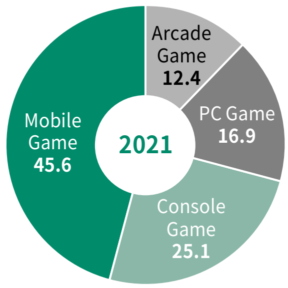
The size of the global gaming market in 2021 increased by 8.7% YoY, amounting to USD 219.758 billion. The mobile gaming and PC gaming markets increased by 11.1% each, leading to the growth of the global gaming industry. All platforms showed growth, with the arcade gaming market rising by 10.5%, and the console gaming market up by 2.2%.

The mobile platform, which has been maintaining its highest share in the global gaming market since 2016, occupied the entire gaming market with a 45.6% share, amounting to USD 100.234 billion, in 2021. Following the mobile gaming market, the console gaming market has a 25.1% share that amounted to USD 55.14 billion, while the PC gaming market has a 16.9% share, amounting to USD 37.243 billion, and the arcade gaming market has a 12.4% share, amounting to USD 27.142 billion.

The mobile platform game market share is expected to increase further to 48.6% by 2024 in the future global gaming market, following improvements in smartphone device performance and the expansion of high-speed wireless networks. However, the arcade gaming market is expected to decrease slightly to 11.6% in 2024 despite the recovery from COVID-19.

Figure 6 Global Gaming Market Share by Platform(2021/2024)

(Unit: %)

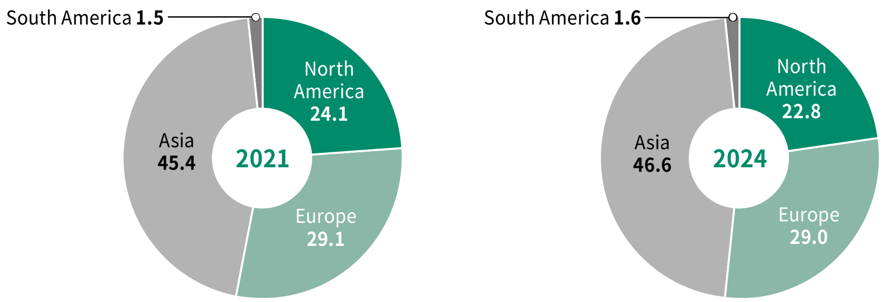


Source: PWC(2021), Enterbrain(2022), JOGA(2022), iResearch(2022), Play Meter(2016), NPD(2022)

In terms of the market share of each region in the global gaming market, it is expected that, by 2024, the shares of Asia and South America will slightly increase, while that of North America will decrease, compared to 2021. Based on the growth of mobile gaming in China and Korea leading the global mobile gaming market, the market share of the Asian region is expected to increase by 1.2%p, from 45.4% in 2021 to 46.6% in 2024. On the other hand, despite the growth of the gaming industry, North American market's growth in the global gaming market is expected to decrease by 1.3%p to 22.8% in 2024.

Figure 7 Global Gaming Market Share by Region(2021/2024)

(Unit: %)



Source: PWC(2022); Enterbrain(2022); JOGA(2022); iResearch(2022); Play Meter(2016); NPD(2022)

Part 2 Major Issues in the Domestic Gaming Industry in 2021

1) Termination of the Shutdown Law

In November 2021, some amendments to the [Youth Protection Act], which included the termination of the compulsory game shutdown law, were passed in the National Assembly. The mandatory game shutdown law is a system that prohibits the provision of Internet games to youth under the age of 16 during late-night hours, from 0:00 to 6:00 am. It was introduced with the revision of the Youth Protection Act in 2011 to ensure the youth's right to sleep and to prevent excessive immersion.

In 2021, the government selected the improvement of the game shutdown law as a regulatory challenge task. In the past 10 years, the game environment has changed significantly, including mobile games that are not subject to the game shutdown law replacing PC games. The media that youth can use late at night has become diversified, such as social network services(SNS), online video service(OTT), YouTube, and so on.

After reviewing effective youth protection measures, the game shutdown law was abolished and would be unified with a "game time selection system," in which parents and children autonomously control game usage time. The game time selection system allows a person under the age of 18 or a legal representative to set the desired game usage time according to Article 12-3 of the [Game Industry Promotion Act(Game Industry Act)]. The government decided to support the youth and their guardians by increasing the convenience of the existing game time selection system, instead of forcibly preventing all youth from accessing games. The Game Culture Foundation has a game time selection system applying to each game at once to increase accessibility and to handle civil complaints. The service is scheduled to be implemented through a website, and through a mobile application in the future. Moreover, it plans to produce and distribute materials as guides to the contents and characteristics of the games enjoyed by the youth, and distribute a game utilization guideline that introduces the "parental control function" provided by platform operators, such as Google and Apple.

The government strengthened the Game Rating and Administration Committee's post-management function and introduced a post-management system to block elements that are harmful to the youth. Meanwhile, amendments to the law, including the disclosure of probability-type item information and the blocking of harmful advertisements, were also promoted, but were not passed within the year.

The termination of the game shutdown law is meaningful because the shadow regulation that tied up the gaming industry has disappeared in 10 years. Continuous attention and support are required so that the game time selection system, which is the only system to prevent teenagers' excessive immersion in games, can function as a minimum stabilizing measure that controls the youth's game use time.

2) Truck protests and probability-type items

In 2021, an unprecedented power structure between users and game companies were formed in the gaming industry. This is the effect of the emergence of the "truck protest," which expresses mass dissatisfaction beyond the level of protest through the community or customer center.

This is the method of gamers to convey their opinions by sending trucks that are equipped with a display, instead of using loudspeakers in groups. The voices of the younger generation expressed through the truck protest did not stay within the gaming industry. Yet, they spread through video media, such as social network services(SNS) and YouTube.

The truck protest appeared when the complaints about the lack of communication between game companies and users and the fatigue on random items exploded all at once. Netmarble's <Fate/Grand Order> users launched the trend in January 2021. Users who were angry with Netmarble's way of operating the first event of the new year raised money with the community, rented a truck, and started a truck protest in front of the Netmarble building for the first time against the industry. Since it was the first time it was done in the gaming industry, it drew attention. Eventually, Netmarble replaced the head of the Korean version of <Fate/Grand Order>, and recruited additional service personnel.

Since then, a mood has been formed among individual users to take collective action against huge game companies. Users have sent trucks to Gravity, NCSoft, and Nexon because of a collapse in communication with game companies.

The truck protest intensified with Nexon's <MapleStory> controversy over manipulating probability-type items in February. It has been confirmed that the company left errors unattended in <MapleStory> without notifying users of the probability of acquiring some random items. In the end, Nexon announced its apology and decided to develop a system that allows users to check on their concerns regarding probability.

The Fair Trade Commission launched an investigation regarding revising the Game Act, which includes disclosing probability-type item information. It drew political attention, and a member of the National Assembly joined the protest. Amendments targeting probability-type items were proposed. Self-regulation operated autonomously by the industry, was met with backlash. The argument that probability disclosure should be legislated, focusing on the National Assembly, gained strength. The industry announced a stronger self-regulation plan but failed to win public sentiment.

The truck protest is meaningful because it conveyed the voices of general users to game companies. Moreover, "truck cheer" appeared to show support for game companies contrary to the truck protest. In February 2021, Smilegate's <Lost Ark> users sent a coffee truck to the development team, and during the same period, Com2uS's <Tiny Farm> users donated the money they collected for the protest to solve the problem through talks with the game company.

3) Rise of monetizable games, play-to-earn games

The gaming industry, which has experienced a strong backlash against probability-type items from users and politicians, has increased the search scope to find a new driving force. It attempted to launch a new industry using artificial intelligence(AI) and digital human technologies accumulated through adjacent industries, such as entertainment and game development. The most popular among them was the P2E(Play to Earn) game that uses blockchain technology, especially non-fungible tokens(NFT).

P2E is the concept of making money while playing games. It is a system that allows goods used in the game to be exchanged for utility coins and converted into actual cash at the exchange. In existing games, users rent items from game companies, so when they quit or move on to other games, they are not compensated for the amount and time they invested. However, P2E drew attention to the concept of enabling users to own items and retain their value.

In the gaming industry, small and medium-sized game developers were the first to respond to P2E games. It approached users through marketing by advocating that users could have in-game goods. Since users can earn money by playing games, it was received favorably by being labeled as the future of games after exhibiting productivity at the level of being responsible for living in some countries, where the basis for actual economic activity is poor.

Since the emergence of cryptocurrency, games have been evaluated as optimal where such currency can be used. The economic ecosystem was built with virtual goods or game money in the virtual world. Game users are also relatively familiar with the characteristics of cryptocurrency as they deal with game items and game money. However, since the business model based on probability-type items was firmly established, and the game company owned the goods in the game, they were not active in introducing cryptocurrency and NFT.

In the domestic gaming industry, Wemade and Com2uS Holdings-Com2uS were the most active. Wemade set a goal of launching 100 games on its own platform, Wemix. It established a plan to build a game ecosystem with Wemix as the key currency. Com2uS Holdings and Com2uS presented a vision to grow into the world's best blockchain game platform, changed their corporate structure and constitution to coins and metaverses, and combined existing intellectual property(IP) and new games with NFTs. Companies with more than KRW 1 trillion sales also joined, while Nexon, NCSoft, Netmarble, Krafton, and Kakao Games introduced P2E to their IPs. In Korea, however, the distribution of such P2E games is impossible due to the prohibition on gift-giving and promotion of speculation under the current Game Industry Act.

There was also unfriendly attention toward P2E. Opinions were divided even within the industry. Concerned about the phenomenon of recklessly jumping into P2E to expand the business model(BM), it was pointed out that it was merely adding coins to the existing probability-type item game. There was a conflict between the view that highly regarded it as the "future of the game" and would change the game company's profit model paradigm, and the one that interpreted it as the second coming of "Sea Story." Users' opinions were divided. Those who positively view P2E games emphasized economic feasibility, while others who viewed P2E games negatively compared the structure, in which profits are generated only when there are more users, to Ponzi schemes. This is because it has a structure, in which users who enter first attract users and then get out.

4) Salary increase relay in the gaming industry

There has been a fever of rising developer salaries in the gaming industry. After Nexon announced a lump sum annual salary increase of KRW 8 million and an initial salary of KRW 50 million for developers in February, major game companies continued to announce annual salary increases. NCSoft raised the starting salary to KRW 55 million, and the annual salary for development workers by KRW 13 million. They also removed the starting salary limit. Krafton raised the initial salary of the development staff to KRW 60 million, making the industry annual salary increase process a social phenomenon. Netmarble and Gamevil(now Com2uS Holdings) also raised annual salaries by KRW 8 million each. Neowiz raised the annual salary by KRW 6 million, regardless of development and non-development positions. Moreover, game companies, such as Pearl Abyss, Smilegate, JoyCity, and Vespa, also raised the annual salary of development and non-development positions all at once.

The series of salary increases in the gaming industry stemmed from a move to find developers with outstanding abilities. This is because new technologies, such as metaverse, have emerged, and related services have spread not only to start-ups and information and communication(IT) industries, but also to all fields like finance and distribution, resulting in a significant shortage of development personnel. Game companies and unicorn startups like Karrot

Market and fintech companies like Toss Bank and KakaoBank have begun hiring IT talent with stock options and bonuses.

In addition to the shortage of developers, there is analysis of the prevalent decision to raise salaries began when the gaming industry emerged as a non-face-to-face beneficiary since the advent of COVID-19 in 2020. In fact, Nexon opened an era of KRW 3 trillion in annual sales for the first time in the industry, with sales of KRW 3.13 trillion in 2020. Netmarble recorded KRW 2.4848 trillion in sales, with a 14% increase from the previous year. NCSoft’s annual sales were KRW 2.4162 trillion, exceeding KRW 2 trillion for the first time since its founding. There is also an interpretation that the company chose an annual salary increase as a strategy to compensate insiders and increase the scale by securing development positions.

As a result of the annual salary increase, the labor cost of the top 5 companies based on the market capitalization of listed game companies in 2021 increased by 42%. The average salary per person at Krafton, NCSoft, Netmarble, Pearl Abyss, and KakaoGames was KRW 110.32 million, a 42% increase from the previous year(KRW 77.59 million). During the same period, total wages increased by 39% from KRW 62.58 million to KRW 86.84 million.

As the wage gap widened, there were concerns about the lack of employment at small and medium-sized game companies. It was also pointed out that polarization accelerated as mid-sized companies disappeared. Large game companies started recruiting talent by acquiring small developers one after another. It was a strategy to secure human resources while also acquiring IP.

The salary increase relay eventually led to a deterioration in the performance of game companies. There was no new production after labor costs rose. Large game companies withstood the shock, but small and medium-sized game companies encountered difficulties. In February 2021, Vespa received a notice from the KOSDAQ HQ, particularly a “concern about the designation of management stock” due to business losses exceeding 50% of its equity capital after the annual salary increase. In August, it released <Time Defenders> in Japan in advance, but it was unsuccessful at the box office, and failed to turn the situation around.

5) The era of 3N+SK2

As the burden of labor costs following the annual salary increase relay and stagnancy in the release of new games due to the controversy over probability items coincided with the performance of existing large game companies, a growing power emerged. A new term called 3NSK2 appeared by taking the first English letters of Nexon, NCSoft, Netmarble, Smilegate, KakaoGames, and Krafton.

KakaoGames, which succeeded in being listed in 2019, ranked first in sales for 17 weeks with <Odin: Valhalla Rising>(Odin), ending the era of leading intellectual property rights of <Lineage>. Its sales in 2021 were about KRW 1.125 trillion, an increase of about 104% compared to the previous year, achieving the highest performance ever. The operating profit increased by approximately 72% YoY to KRW 114.3 billion, and the net income increased by approximately 671% YoY to KRW 520.3 billion. The 2021 annual performance recorded the highest sales and operating profit since its founding, based on the sales of existing mobile and PC games, with the launch of the new <Odin> and other sales performance in the non-game sector. Due to the continued growth of subsidiaries such as Kakao VX, other sales increased by about 140% YoY to around KRW 150.5 billion, contributing to the overall increase in sales after breaking the record.

Krafton, another axis of emerging powerhouses, succeeded in listing on the KOSPI in 2021 after the global box-office success of <Battleground>. <Battleground Mobile> was popular in China, India, and the Middle East. Encouraged by its popularity in India, Krafton established an Indian corporation and made aggressive investments. As the first among domestic game companies, Krafton invested KRW 100 billion in India alone before going public. In addition to game companies, Krafton also invested in various fields, including e-sports, game streaming, and web novel platforms, such as NOWDIN Gaming(e-sports company), Loco(game streaming), Pratilipi(web novel platform), 3One4(initial VC fund), Tamatem Games(Middle Eastern mobile game distributor), FRND(social platform), Nautilus Mobile(game developer), etc. It attempted to build a game ecosystem based on intellectual property rights(IP), such as holding a local e-sports competition with its <PUBG Mobile India>. It was also a strategy to solidify Krafton's intellectual property(IP) ecosystem by entering emerging markets with India as the focus, leading to the Middle East and Africa.

With Krafton's listing, precedents such as Pati Games, Action Square, Vespa, and ThumbAge rose and fell, raising concerns about "one-hit wonder" game companies. It pointed out that Krafton has <Tera>, but its box-office hit was only <Battleground> IP. Conscious of this, Krafton put forward "PUBG Universe" as a new strategy, following the acceleration of IP convergence within the content industry, including <The Bird that Drinks Tears>. PUBG Universe expands the powerful IP created through games to various entertainment areas. It presented a blueprint to maximize its potential by reproducing the Battleground story with the theme of "survival" as media, platforms, and contents.

Smilegate was evaluated to have risen to the ranks of Korea's leading game companies both in name and reality, posting sales of KRW 1.4345 trillion in 2021, and recording more than KRW 1 trillion in annual sales for two consecutive years. Smilegate's growth potential was expected to be high. This is because <Lost Ark> recorded more than KRW 1 trillion in annual sales for two consecutive years, though achievements gained from entering the global stage were not included. Smilegate also achieved results in platform construction not implemented by other large game companies. The sales of Smilegate Stove, a group affiliate in charge of the stove platform, increased by 222.9% YoY to KRW 74.63 billion. Smilegate Stove, which had been in the red until the previous year, also turned black with an operating profit of KRW 2.86 billion. Based on this development, the Smilegate Group was not only evaluated for establishing a value chain comprising of PC game - mobile game - platform - social contributions, but also for being listed among large game companies.

6) E-sports being recognized as a sport/industry

In December 2021, the Korea e-Sports Association(KeSPA) regained its associate member status after four years after being approved by the Korea Sports &

Olympic Committee(KSOC)'s board to join as an associate member. Since then, the private sector, such as the association, started a project that could recognize e-sports as an official sports category. The government has started working to establish standards for e-sports to take the lead in the international e-sports stage.

Becoming a member of KSOC has been a long-cherished project of KeSPA. The association, which received quasi-affiliation approval from KSOC in 2015, lost its associate membership in 2017 because it failed to meet the newly established standards. Later, e-sports was selected as a demonstration event at the Jakarta Palembang Asian Games in 2018, and temporarily acquired associate membership in 2018. And then, in 2021, it was promoted as an associate member after fulfilling the requirements of an associate member of the Korean Sport & Olympic Committee(being an associate member of 9 or more city and provincial sports associations).

KeSPA, which obtained associate member status, signed a joint marketing program agreement with KSOC. After getting permission to use the national brand and image at the Hangzhou Asian Games, KeSPA started to promote e-sports to the public. Moreover, it initiated systematizing e-sports national team-related systems, such as player selection, national team training, and marketing campaigns. It laid the foundation to expand further Korea's influence in the international e-sports world, such as entering the Olympics and turning domestic games into e-sports.

In 2021, e-sports took a step forward in terms of policy. The "Esports Championships East Asia Seoul 2021" was hosted by the Ministry of Culture, Sports, and Tourism, and supervised by the Esports Championship East Asia Organizing Committee. The championship is the first national e-sports competition led by three governments and was planned to promote friendship among Korea, China, and Japan through e-sports and secure global leadership. About 130 players and executives from Korea, China, and Japan and about 50 key figures attended the event. <League of Legends>, <PUBG: Battlegrounds>, <Clash Royale>, and <PES2021> were selected as official events, and <Dungeon Fighter> was selected as a demonstration event. The Korean government decided to promote the international standardization of e-sports to secure global leadership, and chose this championship as the starting point.

During the e-sports championship, a game culture festival, a side event, was also held. Many game companies and related organizations participated, and held a cultural event festival consisting of a variety of programs, such as game experience, game literacy education, orchestra performance, e-sports player fan meeting, flea market, character photo zone, and small and medium-sized business game showcase.

7) <Lost Ark>, which reminded the gaming industry of the importance of communication with users

Smilegate's <Lost Ark> became successful through active communication with users. Smilegate's RPG <Lost Ark>, which was created after seven years of development and an investment of KRW 100 billion, received bad reviews at the beginning of its release due to its graphic downgrade, automatic combat items, and balance. It also continued to expose unstable parts in terms of operation, but it overturned the evaluation with a promised update.

A twist occurred when it introduced 31 of the 36 update items as promised at the first anniversary celebration event. Excluding two long-term update items and offline regular meeting support that could not be implemented due to the impact of COVID-19, the implementation rate is 90%. In addition to simple content updates, various challenging system changes in a large-scale multi-user online role-playing games(MMORPG) were carried out, such as equipment acquisition, growth mechanism, sailing, and gathering. A user reacted when the said promise was kept. After the Season 2 update, the number of daily visitors increased by 122%, new users increased by 542%, and returning users increased by 213%.

There have also been cases where the company removed content users disliked. The company decided to give up 17% of <Lost Ark> sales, and reinvest it into the game. Keum Kang-seon, the general director of Lost Ark, received applause from users when he said, "We will give up on the military commander rewards feature that caused inflation in the game. As much as sales in other areas have increased, we will give it up cleanly and reinvest it in Lost Ark." Moreover, Smilegate sent developer letters or met and communicated with users in game. In response, users even produced a cheering advertisement and delivered it to the development team.

Though there have been various cases of users criticizing game companies, it is unusual for them to give a gift of advertisement to express their gratitude. The company's operating direction that puts importance on the game operation by actively reflecting user opinions and the value of user return was analyzed as a major factor. Users gave high evaluations on the service and the development and operation direction of Smilegate, which has continuously communicated with them.

Smilegate did not stop there, but took the lead in expanding positive influence by establishing a user-participating donation culture. In a situation where interest in corporate social responsibility is growing, and an increasing number of people are going through difficult times due to COVID-19, Smilegate's move to expand the good influence of games has raised another topic in the gaming industry.

8) Gaming arcades establishing a foothold to rebound as a family-friendly leisure space

In 2021, a foothold was established to leap forward from the stagnant arcade industry. In Korea, point-rewarding arcade gaming has been legally banned since 2007. Since then, the arcade gaming industry has been in decline to this day. While arcade gaming occupied a 12.4% share in the global gaming market in 2021, its share in the domestic gaming market was only 1.3%. Moreover, while the non-face-to-face gaming market grew rapidly due to COVID-19, the arcade gaming industry suffered severe stagnation. The industry's sense of deprivation was even greater, as the operation of gaming arcades across the country was suspended, and overseas exports were delayed or canceled.

Point compensation-type arcade gaming refers to a game in which, after a user enjoys a game in a gaming arcade, the game results according to ability are accumulated as points, and can be converted into products suitable to the score. In the US, China, Japan, and European countries, gaming arcades have long been established as family entertainment centers, just like fast food franchises, restaurants for children's events, and adult-oriented public restaurants. Thus, in order to revitalize the arcade gaming industry, which was in a slump, the government initiated a pilot project for point compensation-type arcade gaming by utilizing the regulatory sandbox system on April 17, 2021.

The arcade gaming industry has high expectations to create a new leisure culture by being reborn as a leisure space for families and couples. Arcade gaming distributors and developers also expressed their gratitude, believing that they would be able to increase their export competitiveness by securing a domestic test environment to advance into overseas markets. In the long term, the pilot project for point compensation-type arcade gaming can expect the development of games out of various contents through the convergence with K-pop, dramas, and movies by taking advantage of the characteristics of an indoor complex cultural space, and the revitalization of the point compensation product industry.

9) Slow popularization of cloud gaming

In 2021, IT giants such as Microsoft, Google, Nvidia, Sony, Amazon, and Tencent challenged the field of "cloud gaming," but its popularization was far-off.

Cloud gaming drew attention as a platform that satisfies the volume of PC/console gaming and the accessibility of mobile gaming. It was expected to create a new gaming market by combining with 5G communication and subscription business models, but its popularization proved difficult in 2021.

Microsoft announced in November that it would lower the price of the Korean service, "Game Pass Ultimate," which supports cloud gaming for the first time by trying to lower the entry barrier. It was analyzed as the company's strategy to disseminate cloud games in Korea by lowering subscription prices.

Microsoft showed interest in the Korean market from the time it tested a cloud game named "Project xCloud." It observed the trend by selecting Korea as one of the test countries, with the US and the UK. It acknowledged that Korea is suitable for testing cloud games and promoting the game pass brand with its high penetration rate of smartphones and PCs, although the base of support for the Xbox console is weak.

However, apart from Microsoft, other companies seemed to withdraw their footing. Google Stadia was willing to expand by successfully entering the Apple ecosystem, but eventually abandoned its own development, and gave up on platform expansion after all. Google announced that it had decided to suspend the operation of its internal development organization due to the high-cost structure of game development. Sony chose the subscription economy over cloud gaming, and Tencent and Amazon failed to commercialize it.

The establishment of a stable service foundation was slow, and the lack of content supply and demand delayed cloud gaming development. In Korea, all three mobile telecommunication companies announced their entry into the cloud gaming market, but network quality, the core of cloud gaming, failed to catch up. A game where victory or defeat was determined by frame was virtually impossible to run. There are two types of 5G: 3.5 GHz, a low frequency band, and 28 GHz, an ultra-high frequency band. The maximum speed of 28 GHz is 20 times faster than Long Term Evolution(LTE) 4G, and the latency is short. However, due to the short reach and the need to install more base stations, domestic carriers provided 5G services at 3.5 GHz, resulting in delays.

The problem with the supply and demand of titles also got in the way. Since there were no killer titles, it fell out of interest. Also, the fact that the subscription to an old game was mandatory was against the propensity of domestic game users who prefer to collect titles. Core game users, who are expected to enter cloud gaming first, have not been interested because they already have high-end PCs and consoles. As a result, more time seems required before the growth, profitability, and business feasibility of the cloud gaming market are verified in many ways.

10) The gaming industry's first step for ESG management

In 2021, game companies started ESG management in earnest. ESG is an abbreviation of environment, social, and governance, and has recently emerged as a new paradigm for corporate value. The key is to achieve sustainable development through eco-friendliness, social responsibility, and ethical governance in all corporate activities.

In the beginning, NCSoft established the "ESG Management Committee" for the first time as a domestic game company in March to strengthen sustainable management. Five months after the launch of the ESG Management Committee, NCSoft published the "NCSoft ESG Playbook," a sustainability management report containing the company's ESG management vision and achievements. The report contains the management vision and detailed activities established around the company's corporate value of "PUSH, PLAY." Later, Pearl Abyss, Com2uS Group, and Netmarble also established ESG Management Committees.

The key point of game companies' ESG management is protecting the environment(E) sector. According to the ESG rating evaluation by the Korea Institute of Corporate Governance and Sustainability(KCGS), the gaming industry received B or higher overall in society(S) and governance(G), but most of them received D in environment(E). Efforts to protect the environment and prepare standards that meet external evaluations must be pushed, but it is not easy to apply them in real life. Game development and service require enormous electricity. Thus, game companies are looking for leads in the new headquarters. Netmarble and Com2uS set a policy to build an eco-friendly office building in consideration of the ESG environment sector.

However, some pointed out that ESG activities in the gaming industry remain in a declaratory sense. Donations or volunteer activities in fields unrelated to gaming are the next things after game companies practice social responsibility and influence through games.

Part 3 Game Utilization Characteristics

1) Overall game play rate

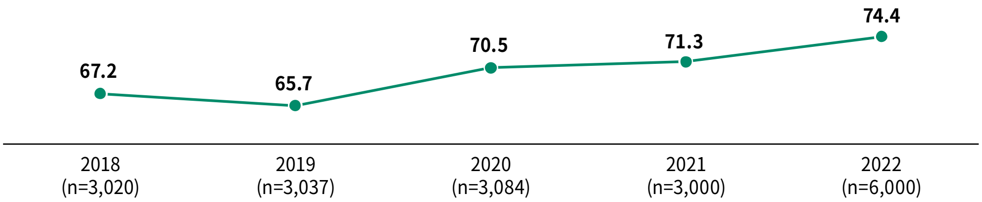
According to a survey on the general public(n=6,000) ages 10 to 65 years old regarding game usage since June 2021, 74.4% among them played games. The mobile gaming platform(84.2%) received the highest usage rate among those exposed to games(n=4,462). In terms of usage, PC games achieved 54.2%, console games, 17.9%, and arcade games, 9.4%.

Moreover, 99.0% of the respondents(n=4,462) with experience in playing games usually accessed the Internet. When game users were asked about the device that they used to log on to the Internet for purposes other than work/academics, the response rate showed that 90.4% use “smartphones,” 59.4% use “desktop PCs,” 54.3% use “laptops/netbooks,” and 35.9% use “tablet PC.”

Figure 8 Game Utilization

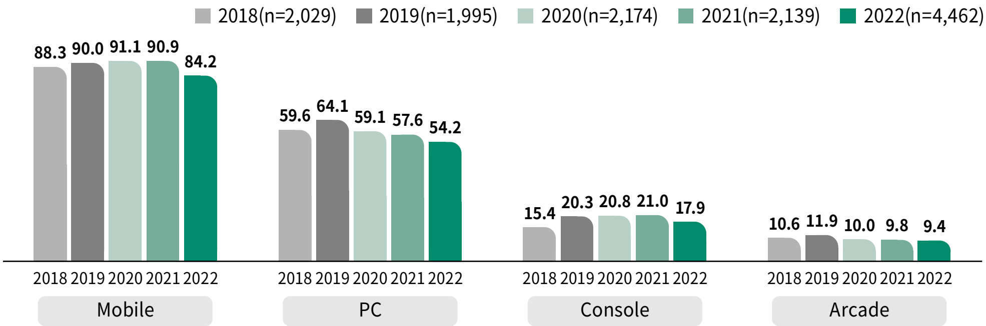
▪ Overall Game Utilization(2018~2022)

(Unit: %)



▪ Utilization by Platform(2018~2022)

(Unit: %, multiple responses)



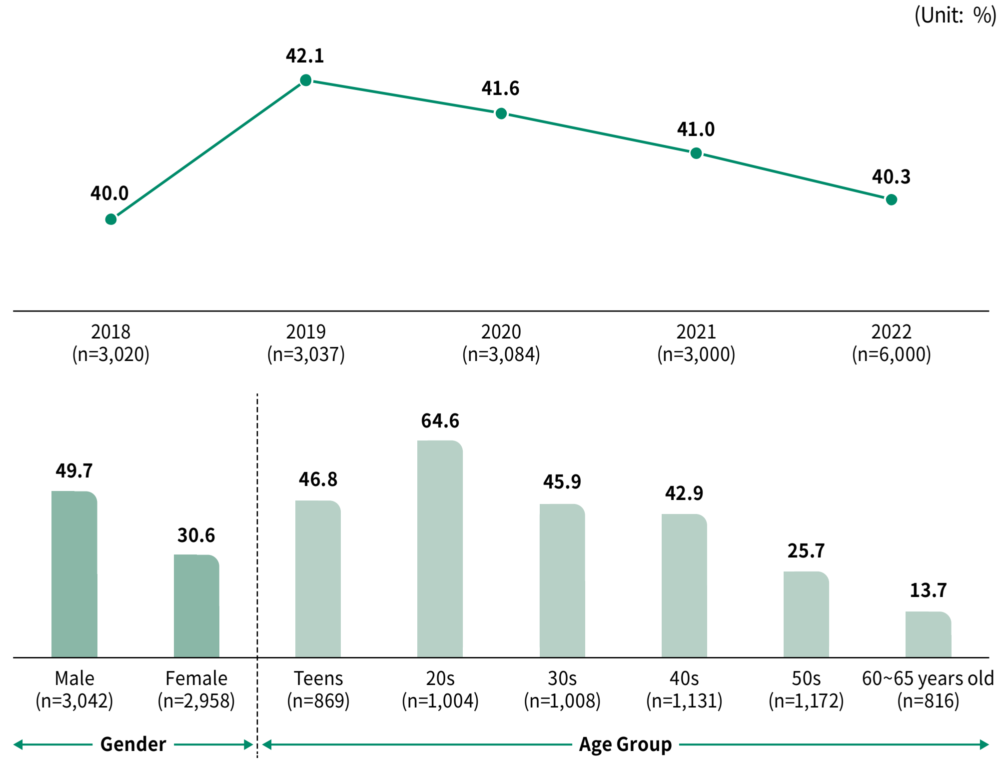
2) Game utilization rate by platform

(1) PC game

The recent(after June 2021) utilization rate of PC games[1] for all respondents (n=6,000) was 40.3%, a 0.7%p decrease from the utilization rate of PC games in 2021, which was 41.0%.[2]

Looking at the characteristics of the respondents, the PC game utilization rate among males was significantly higher than that among females and was comparatively higher among those in their 20s and below. The PC game utilization rate has declined since 2019, and the trend continued in 2022.

Figure 9 PC Game Utilization



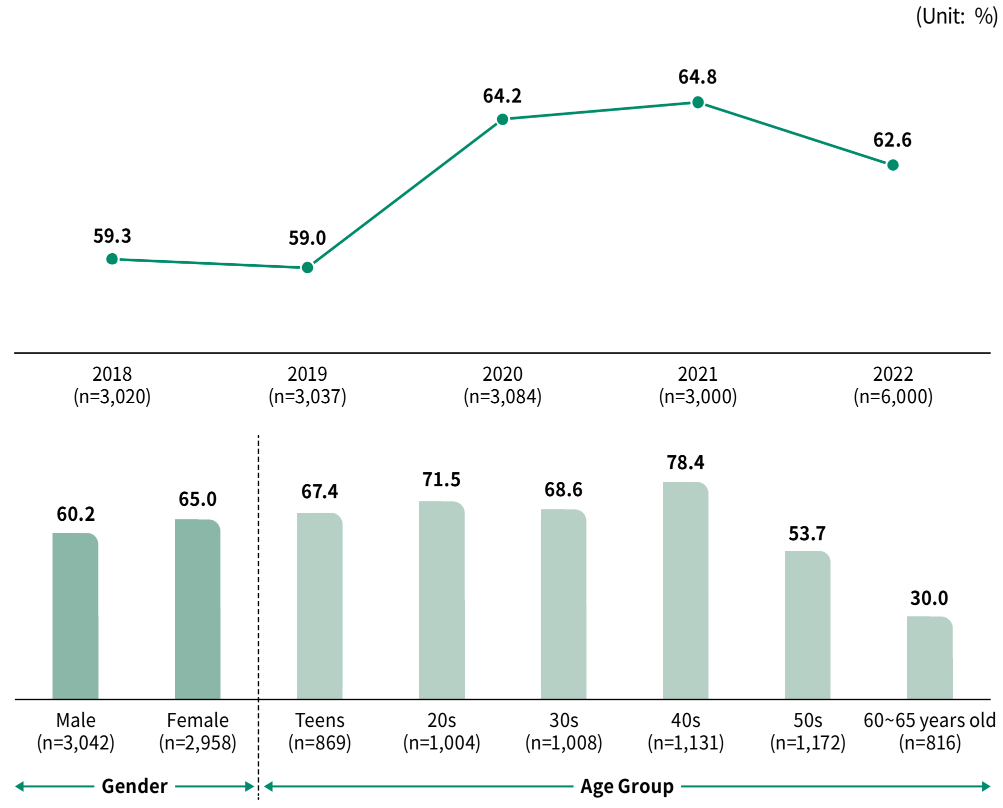
1) Games installed to a PC after they were downloaded from the Internet, or purchased as a game software package. Web browser-based games, which do not need a client program, are included as well.
2) Since the decrease is smaller than the sample error range(±1.3%p, 95% confidence level), it requires attention to derive interpretation.

(2) Mobile game

The recent(after June 2021) utilization rate of mobile games[3] of all respondents(n=6,000) was 62.6%, a 2.2%p drop from the utilization rate of mobile games in 2021, which was 64.8%.[4]

Looking at the characteristics of the respondents, the mobile game utilization rate among males was higher than that among females by 4.8%, and by age, those in their 40s had the highest utilization rate. It was found that the mobile game utilization rate increased from 2020, and decreased in 2022.

Figure 10 Mobile Game Utilization



3) Games in the form of apps used through portable devices such as smartphones and tablet PCs(iPad, Galaxy Tab, etc.) (Games using general mobile phones(feature phones) other than smartphones are excluded from this target.)

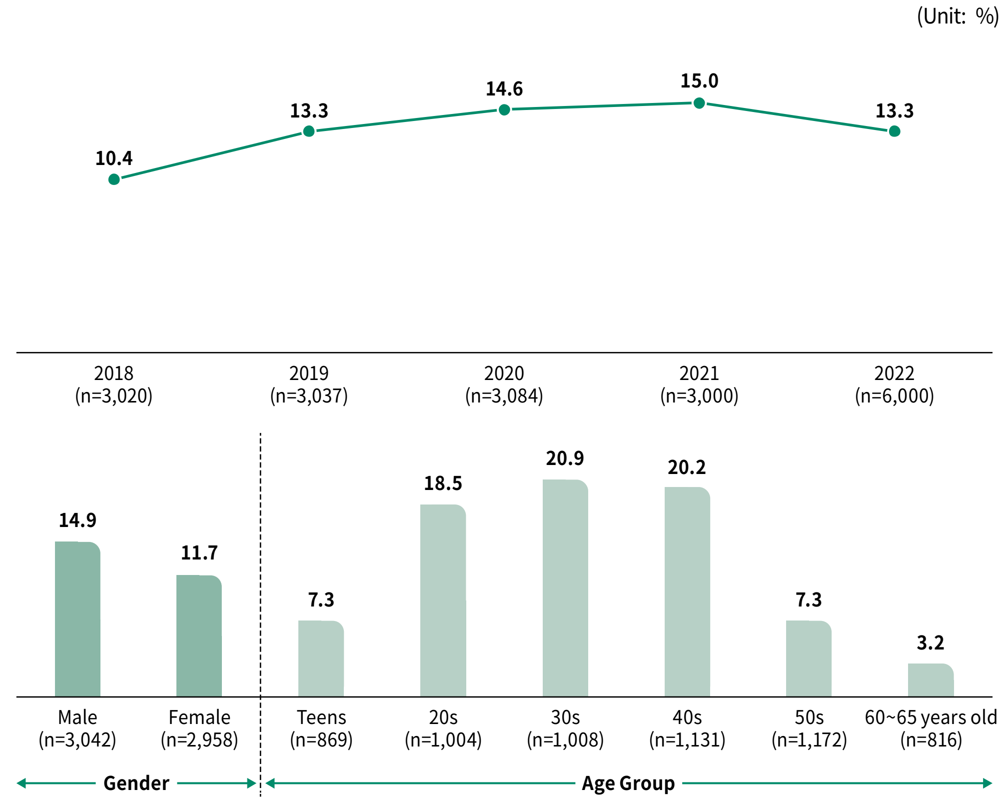
4) The sampling error range is about ±1.3%p at the 95% confidence level.

(3) Console game

The recent(after June 2021) utilization rate of console games[5] of all respondents (n=6,000) was 13.3%, a 1.7%p drop from the utilization rate of console games in 2021, which was 15.0%.[6]

By characteristics of respondents, males appeared higher than females, and it showed that the utilization rate of console games was relatively high among those in their 30s compared to other age groups. The console game utilization rate steadily increased from 2018, but decreased in 2022.

Figure 11 Console Game Utilization



5) Includes games played on game consoles(Playstation, Xbox, etc.) connected to a TV or a display screen, as well as portable consoles(PS Vita, Nintendo Switch, etc.)

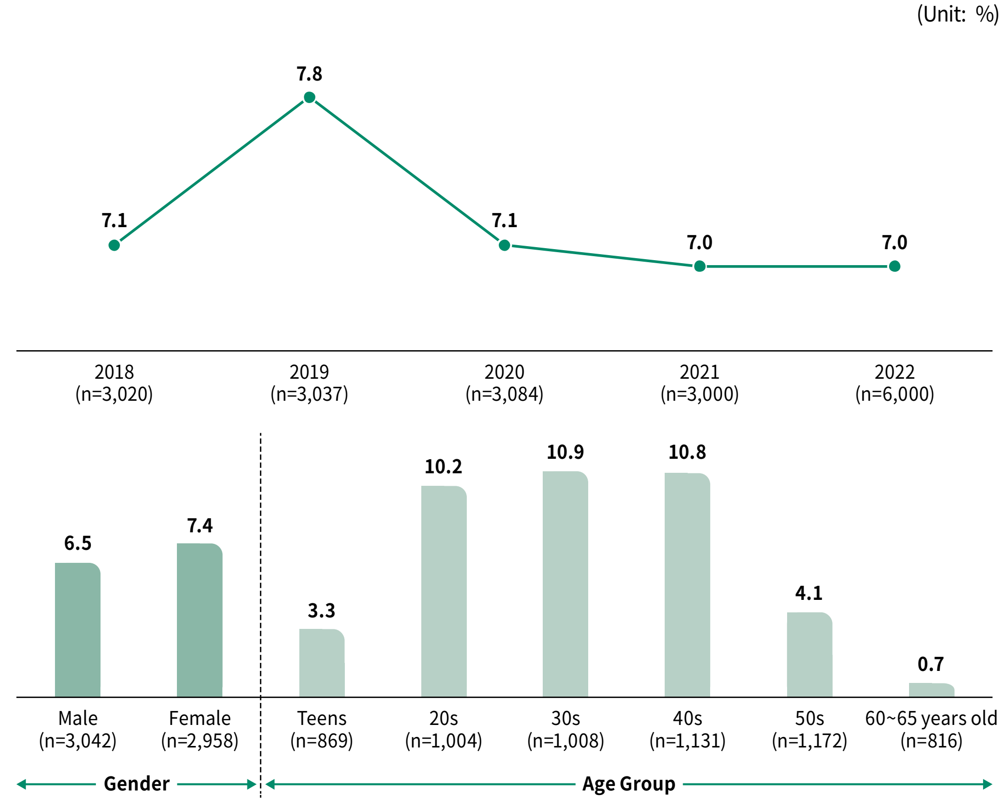
6) The sampling error range is about ±1.3%p at the 95% confidence level.

(4) Arcade game

The recent(after June 2021) utilization rate of arcade games[7] of all respondents (n=6,000) was 7.0%, which is the same as that of 2021.[8]

By characteristics of respondents, males appeared higher than females, showing that the utilization rate of arcade games was relatively high among those in their 20s to 40s compared to other age groups. The arcade game utilization rate decreased from 2020, but in 2022, it was the same as the previous year.

Figure 12 Arcade Game Utilization



7) Refers to video games played at a facility commonly referred to as an arcade.
8) The sampling error range is about ±1.3%p at the 95% confidence level.

2022 WHITE PAPER ON KOREAN GAMES

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