

THE MOBILE GAMING MARKET: THE CURRENT STATUS AND FUTURE
COMPARED TO OTHER GAMING PLATFORMS



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YEDİTEPE UNIVERSITY
GRADUATE SCHOOL OF SOCIAL SCIENCES
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PLAGIARISM

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

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ABSTRACT

Today, smartphones have become a necessity for everyone. It is used by people of all ages, regardless of whether they are children or the elderly. For this reason, it is more accessible than other gaming platforms. Mobile games have become a platform where people can spend time comfortably while having fun in daily life and it has also become one of the most popular gaming platforms of our time. This thesis contains information about observing events that led to the significant development of mobile games especially cryptocurrency mining, chip crisis and COVID-19. Also, the thesis contains information about how it may follow a path compared to other gaming platforms in order to make a prediction about the improvement of the mobile game industry in the future. The topics mentioned in this thesis will be useful for many people such as game designers, developers and phone manufacturers to produce ideas that are suitable for them.

The first part of the thesis provides an in-depth analysis of how the mobile, PC and console platforms led to the emergence of games and how these events happened.

The empirical part of the thesis includes the interpretation of the developments of mobile, PC and console platforms over the years with the effect of cryptocurrency mining, chip problem and COVID-19 taking into account the graphics given in the figures. In addition, the empirical part composed of a quantitative questionnaire about to examine and analyze people's attitudes towards mobile games now and in the future.

The data analysis was done descriptively.

Keywords: Mobile Platform, PC Platform, Console Platform, Game Platforms, Smartphones, Comparison of Gaming Platforms, COVID-19, Chip Crisis, Cryptocurrency Mining

ÖZET

Günümüzde akıllı telefonlar herkes için bir ihtiyaç haline gelmiştir. Küçük ya da büyük fark etmeksizin her yaştan insan kullanmaktadır. Bu sebeple diğer oyun platformlarına göre daha erişilebilirdir. Mobil oyun insanların gündelik hayatta eğlenerek kolayca zaman geçirebileceği bir platform haline gelmiştir. Aynı zamanda çağımızın en popüler oyun platformlarından biridir. Bu yüksek lisans tezi mobil oyunların önemli ölçüde gelişmesine sebebiyet veren olayların özellikle kripto para madenciliği, çip sorunu ve COVID-19 konularının gözlemlenmesini ve ileri gelecekte olabilecek mobil oyun sektörünün gelişimine dair bir öngöründe bulunabilmek için diğer oyun platformlarına kıyasla nasıl bir yol izlediği ya da izleyebileceği ile ilgili bilgiler içermektedir. Bu tezde değinilen konular oyun tasarımcılarına, geliştiricilere ve telefon üreticileri gibi pek çok kesime kendilerine uygun fikirler üretebilmek adına fayda sağlayacaktır.

Tezin ilk kısmı, oyunların ortaya çıkmasını sağlayan mobil, PC ve konsol platformlarının nasıl bir gelişim yaşadığına ve bu olayların nasıl gerçekleştiğine dair özellikle kripto para madenciliği, çip sorunu ve COVID-19 konuları üzerinde durarak derinlemesine bir inceleme sunmaktadır.

Tezin ampirik kısmı mobil, PC ve konsol platformlarının gelişimlerinin kripto para madenciliği, çip sorunu ve COVID-19 konularının etkisiyle yıllara göre meydana gelen farklılıklarını tablolarda verilen grafikler göz önünde bulundurularak yorumlanmasını içermektedir. Ayrıca ampirik kısım, şimdi ve gelecekte insanların mobil oyunlara olan tutumlarını incelemeyi ve analiz etmeyi amaçlamaktadır. Bu yapılacak inceleme ve analiz anket çalışması yardımıyla oluşturulmaktadır.

Veri analizi tanımlayıcı bir şekilde yapılmıştır.

Anahtar Kelimeler: Mobil Oyunlar, Oyun Platformları, PC Platformu, Konsol Platformu, Mobil Platform, Akıllı Telefonlar, Oyun Platformlarının Karşılaştırılması, Çip Krizi, COVID-19, Kripto Para Madenciliği

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LIST OF ABBREVIATIONS

YoY – Year of Year

SEGA – Service Games

PS – PlayStation

PC – Personal Computer

SPC – Statistical Process Control

IBM – International Business Machines

NES – Nintendo Entertainment System

SSD – Solid State Disk

CD – Compact Disc

GPU – Graphics Processing Unit

CPU – Central Process Unit

ASIC – Application Specific Integrated Circuit

AMD – Advanced Micro Devices

USA – United States of America

VR – Virtual Reality

1.INTRODUCTION

This thesis, explains how mobile games have evolved compared to other gaming platforms today and a prediction about how mobile games can improve in the future. In the first part, a literature review is conducted, accompanied by academic research, on how mobile games have changed from past to present and what progress has been made. In addition, other gaming platforms (PC, Console, etc.) are examined and analyzed within the scope of the research.

The first part of the thesis subsequently includes the comparison of mobile games with other gaming platforms by stating their similarities and differences.

The second part of the thesis is a statement about how far the mobile gaming platform can develop in the future, taking into account the positive and negative opinions of the people in the game industry.

1.1. Definition

In this part, the main terms for the understanding of the thesis will be defined and discussed.

1.1.1. Definition of The Term ‘Mobile Platform’

In our time, smartphones have become a necessity for everyone. It is used by people of all ages, regardless of whether they are children or the elderly. For this reason, it is more accessible than other gaming platforms. Mobile games have become a platform where people can spend time comfortably while having fun in daily life and it has also become one of the most popular gaming platforms of our time.

The first telephone device to transmit conversations to each other was the device developed by Alexander Graham Bell and Charles Sumner Tainter and called the 'radiophone'. The scientists successfully accomplished the first mutual sound transmission in 1880. The development of the phone has accelerated considerably after this success.

Afterwards, the first long telephone line was established in 1892 and the first mainland telephone calls were made in 1915. In 1960, intercontinental telephone calls began for the first time via satellite and at the 1984, Motorola's Engineer Martin Cooper developed the first handheld phone named Motorola DynaTAC. This phone weighed more than a kilogram and became popularly known by the nickname 'the brick'. The Brick soon became a must-have accessory for those in good standing. In 1994, IBM launched the first smart phone called Simon Personal Communicator (SPC). With this development, the smartphone market started to improve alongside mobile phones. The widespread use of telephones in the early 2000s arose from the need for people to communicate with each other quickly and easily. In 2008, a large part of the world's population started to use phones. As telephone technology developed, the doors of the virtual world were opened to mobile devices as well as to the PC platform. In addition, the prevalence of phones depends on the camera, which is one of the most important parts of the phone.

The first camera was added to phone in May 1999 in Japan. It was originally called a "mobile video phone" but within a few years all phones added a camera feature and this nickname became history. Before the camera feature on phones became widespread, people had to use a digital camera and a computer at the same time to be active on social media. Accordingly, the fact that phones have cameras has enabled people to prefer using phones instead of digital cameras and computers when using social media. In the beginning, browser games played on social media on the computer, with the increase in the use of social media over the phone in course of time, electronic media sales platforms have transformed such browser games into applications and made available to users. In this manner, the phone platform has officially entered the gaming community.

1.1.2. Definition of The Term 'PC Platform'

Computers are an indispensable part of the modern world. The history of the PC platform goes back to the 1970s, when the first personal computers were developed for hobby purposes by enthusiasts. These early machines were generally sold as user-assembled kits and were often used for educational and hobby purposes rather than serious computing tasks. The PC platform, which is one of the most

popular platforms today, initially emerged as devices aimed only at processing simple numerical data and solving mathematical operations. However, over time, with the development of electronic circuits and the invention of microprocessors, modern computers have emerged. Today, computers have become fast and powerful devices that can perform millions of operations per second. In other words, its processing capabilities have increased over time and have taken its current form. Computer technology is advancing rapidly. In short, "A computer is an electronic machine that can perform arithmetic and logical operations with the data it receives from the user, keep the results of these operations in its memory, and access the information stored in its memory whenever desired" (Bayındır, 2007). The computer has changed many functions from past to present. At the present, computers can be used in all areas. These areas range from games to education and physic. Computers are available in different types according to their functions.

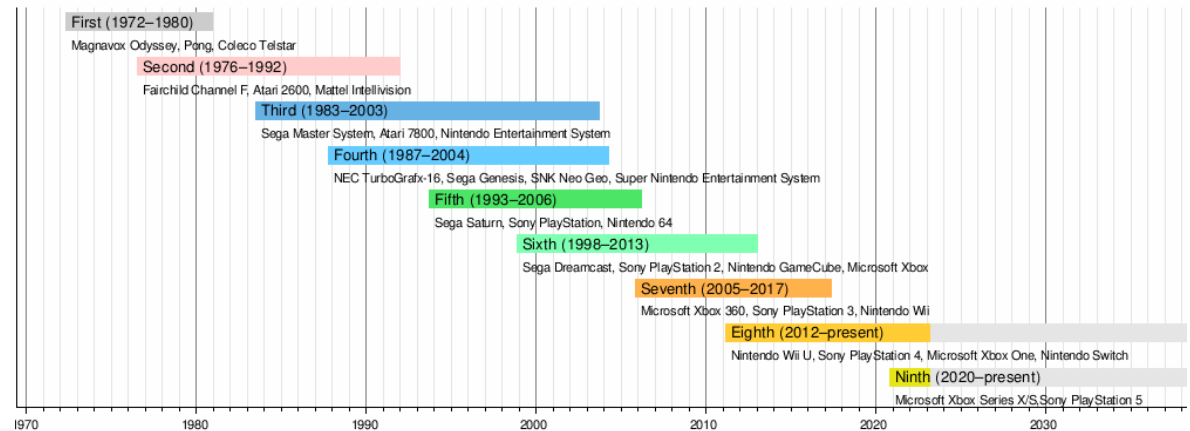
Apart from these types of portable devices such as desktop computers and laptop computers, there are also different types on an even larger scale, such as server computers and supercomputers. While we used to be able to do all our work from a single computer, today there are computers specially produced for many different fields such as architecture, drawing, processing and games. In the current time, computers can only be used in their own fields. The fact that the computer has become a necessity for every human being has brought branding with it. At the present, a high-quality computer that cannot run all current games costs \$2000 because it is the product of a certain big brand, while a normal-quality computer that can run every current game and with an ordinary brand can cost \$800. Of course, which product to buy is left to the consumer's own choice and ideals, without any coercion. Technologies such as artificial intelligence, deep learning and big data are further improving the functionality of computers. In addition, the emergence of new technologies allows computers to become more faster, powerful and efficient.

A computer you can buy for \$1,000 today is far more powerful than the \$10 million worth of mainframe computers in the 1970s. The reason for these prices is that the computer, which used to be very rare and in the luxury category, has become a necessity that can be easily purchased by everyone at the present. The fact that computers have become a device that can be easily purchased by everyone and that people's access to information has shortened significantly has enabled humanity to

make many advances in a short time. However, the rapid development of the age with the use of computers has also revealed some risks. Cyber security threats, hackers and viruses have created quite dangerous situations such as seizing people's private information and making transactions from bank accounts. Solutions such as cyber security and antivirus software have started to be produced for users who want to protect themselves from the aforementioned disturbing situations. Certainly, depending on how much protection you want to be protected, as with computers, many different company options have emerged and have adjusted their prices accordingly. In our time, the PC platform remains one of the most important and ubiquitous computing platforms in the world. Despite competing with other platforms such as mobile devices and game consoles, PC continues to be the platform of preference for many businesses, gamers and professionals. The PC platform has come a long way since its humble beginnings in the 1970s and is showing no signs of slowing down to maintain on its way.

1.1.3. Definition of The Term ‘Console Platform’

The console platform is a computer-inspired entertainment device that allows you to play games with external devices and connections, such as gamepad and television. The first seeds of the gaming world were planted with the introduction of computers, whose origins date back to 1947. Looking at the development stages of the console platform, it is seen that it has gone through a 9-Stage development process.

Figure 1*Stages of The Console Platform*

Source: (Stages of the console platform, 2007, March 7)

With the Magnavox Odyssey console, which is Brown Box's first home type console, the console platform first entered the market in 1972. Magnavox Odyssey, which is the most important of the first generation consoles, caused the birth of ATARI, which played a major role in the spread of console games. The console platform, which became popular with ATARI, has transitioned to a new generation.

Figure 2*Magnavox Odyssey*

Source: (Magnovox Odyssey, 2022, March 10)

Products considered as the 2nd generation began to appear in 1976. The game console that ATARI released in this generation is the Atari 2600, which was very popular in the past. In the beginning, only games could be played with consoles, but with the release of ATARI 2600, media formatting feature was added to consoles with 8-Bit technology. With the media format achievement, game designers have succeeded in making games more attractive and colorful.

Figure 3

ATARI 2600



Source: (ATARI 2600, 2023, April 20)

In 1983, with the emergence of 3rd generation consoles, some new companies started to come forward. The NES, the Nintendo Entertainment System, which we hear today, was thrown into the console world with NES. Unlike ATARI, Nintendo has taken a place in users hearts and achieved great sales figures by offering more beautiful graphic visuals in 8-Bit.

Figure 4*NES*

Source: (NES, 2023, March 8)

In 1988, other companies that saw the great success of Nintendo by passing ATARI started to launch various devices in order to gain a place on this platform. These devices are considered as 4th generation consoles. 8-Bit technology is left behind and a new type of graphics system 16-Bit, has been transitioned. SEGA tried to defeat Nintendo with their new console called Mega Drive 16-Bit, but Nintendo in turn provided a great competition in the market by launching a 16-Bit SNES model. In addition, admirable places such as arcade halls have entered into quite difficult situations with the release of such new consoles because they have offered an innovation that will bring the excitement of arcade halls to homes.

Figure 5*SNES*

Source: (SNES, 2023, April 7)

In 1993, the console platform passed to 5th generation. Innovations in the computer platform have also started to be seen on the console platform. We can easily say that the biggest innovation among them has been 3D technology. Even though ATARI presented a new 5th generation device, it has not been able to hold on to the market. Playstation 1 model made by Sony, one of the most popular game console companies today, came out in 1994. PS1 has gained such a huge advantage against consoles from other companies that many game makers have decided to make games just for PS1.

Figure 6

PS1



Source: (Wikipedia, 2007, March 7)

In addition to 32 and 64-Bit technologies, thin discs called CDs, which have more storage space than others and do not take up as much space as cassettes, have begun to be used. After PS1, which gained a great advantage in the console world, SEGA released new 128-Bit consoles to the market, by causing the 6th generation to start in 1998.

Figure 7*PS2*

Source: (Wikipedia, 2022, March 10)

Figure 8*Xbox*

Source: (Wikipedia, 2007, March 7)

However, Sony took over the throne from SEGA by putting forward the Playstation 2 model in 2000 without making the SEGA's move unrequited, and broke the record for the highest sales figure, which still maintains its top spot, by selling 160 million PS2 consoles.

At the same time, the Xbox console, developed by Microsoft, emerged in 2001. Although not as high as Playstation, Xbox, which has a large sales figure, started the eternal rivalry with PS on these dates. When we come to the time considered as the 7th generation, companies such as ATARI and SEGA have lagged behind. In this period, the great rivalry between PS and Xbox continues with all its harshness. Microsoft succeeded in surpassing Sony by releasing the Xbox 360 in 2005, but it didn't take long for Sony to make a strong comeback. In 2006, Sony released the Playstation 3, which defies the years and still has users today.

Figure 9*PS3*

Source: (Wikipedia, 2007, March 7)

Figure 10*Xbox 360*

Source: (Wikipedia, 2007, March 7)

In addition, Nintendo did not stay idle and aroused curiosity in people by launching the Nintendo Wii console, which works with motion sensors. The Wii unexpectedly achieved huge sales figures. The 7th generation hosted such advanced technology that the 1080p resolution technology we use today was used for the first time in these consoles.

Figure 11*Nintendo Wii*

Source: (Wikipedia, 2007, March 7)

Figure 12*Nintendo Switch*

Source: (Wikipedia, 2023, March)

When we come to the beginning of the 8th generation in 2011, which is still going on today, things have settled to a standard. In 2013, Sony and Microsoft's rivalry continued with the PS4 and Xbox One models. Sony has once again left Microsoft behind with its superior and stable software system that it has maintained for years. Besides to the Sony and Microsoft fierce competition, Nintendo company launched the Nintendo Switch product as a portable console in 2017 and achieved great sales figures in America. However, in countries such as Europe, Nintendo Switch did not receive the attention it expected. Despite all these situations, Nintendo Switch sales figures surprisingly surpassed Sony's PS4 and Microsoft's Xbox One.

Figure 13*PS4*

Source: (Wikipedia, 2007, March 7)

Figure 14*Xbox One*

Source: (Wikipedia, 2007, March 7)

Lastly, the 9th generation starts in 2020. Thanks to the M2 SSD add-on included in the 9th generation products, games can be opened much faster and the screen refresh rate has been increased to 120hz. Meanwhile, two arch-rivals Sony and Microsoft launched their latest model products. These products; PS5 and Xbox Series X/S, whose names we have heard frequently lately. With the growing and developing world technology, the improvement of consoles still continues today (Wikipedia, 2007, March 7).

PS5

Figure 16

Xbox Series X/S

Figure 15



Source: (Wikipedia, 2007, March 7)



Source: (TemplateMonster, 2023, March)

1.1.4. Definition of The Term ‘Video Games’

Video games are electronic games that allow players to access a virtual world and interact with digital characters or objects through input devices such as controllers, keyboards, and touchscreens. Video games can be played on a variety of devices, including dedicated game consoles, personal computers, mobile devices, and virtual reality headsets. The games are designed for single or multiple players and may include various game modes such as cooperative or competitive play. Many video games offer story or narrative for players to earn a range of achievements. Games can also focus on exploration, puzzles or skill-based challenges. Video games generally consist of various genres such as action, adventure, role-playing, idle,

sports, puzzle, online games and strategy games. They can also be classified according to the platforms they are played, such as console, PC and mobile games. Video games have become a popular form of entertainment, where millions of people around the world constantly spend time. In addition, video games have a number of benefits, such as improving cognitive skills, hand-eye coordination and problem-solving abilities. However, excessive gaming also has negative effects such as addiction and social isolation. Therefore, it is critically important to strike a balance between playing games and engaging in other real-life activities.



2. MATERIALS AND METHODS

2.1. Definition of The Term ‘Cryptocurrency Mining Problem’

Unfortunately, there are estimations suggesting that even the Bitcoin network alone consumes as much electricity as a small country in mining processes. The reason the cryptocurrency mining consumes so much energy is that the mining process requires a large amounts of computational power to solve complex mathematical equations. To achieve the computational power required by cryptocurrency mining, miners use powerful computer hardware such as graphics processing units (GPUs) and application-specific integrated circuits (ASICs), which require a lot of electricity.

One of the biggest harms of mining to the game world is the use of graphics cards as a source of passive income more than necessary. Normal individuals or companies have overstocked graphics cards, which are considered the most important part of computers, and use them as an investment tool unnecessarily. Although famous video card manufacturers have taken a precaution against the problem of cryptocurrency mining, 2018 and 2020 have been the fearful years of the gaming world. Cryptocurrency mining has caused a huge setback to the gaming industry. The main reasons for the setback are unnecessary wasted technological materials and since these electronic materials were in demand more than needed, companies had to increase their prices. In addition, as a result of the decrease in computer parts that can be mined, the miners also caused the waste of devices such as phones due to the shortage of computer chip stocks

The cryptocurrency mining problem has become a major environmental issue due to the reliance on non-renewable energy sources to power the mining process. Most Bitcoin mining was done in countries like China, where coal is a major source of electricity. Concerns about the environmental impact of the mining process have increased, as the combustion of fossil fuels leads to greenhouse gas emissions and air pollution.

In addition to the environmental impact, the mining issue has also raised concerns about the centralization of the cryptocurrency mining industry. It has

become increasingly difficult for small-scale miners to compete as the mining process begins to require significant capital to invest in expensive hardware and energy costs. The decline of small-scale miners has also led to the concentration of mining power in the hands of several large mining pools, potentially compromising the decentralized nature of the blockchain.

Today, efforts are being made to develop mining equipment that provides more efficient energy consumption, that is, where renewable energy sources can be used, to power mining operations and to solve the mining problem. Additionally, some cryptocurrencies, such as Ethereum, are exploring switching from a proof-of-work mining algorithm to a more energy-efficient proof-of-stake algorithm. In general, the mining problem is a complex issue that requires a multifaceted solution.

As the popularity of cryptocurrencies continues to rise, focusing on the environmental impact of the mining process is also important to ensure that the industry remains decentralized and accessible to all.

2.1.1. The Effect of Cryptocurrency Mining Problem on Mobile Platform?

The rise of cryptocurrency mining has also had a significant impact on the mobile platform, particularly battery life and performance. Cryptocurrency mining is the use of high-powered computer systems to verify transactions and solve complex mathematical equations to create new cryptocurrency.

Mobile devices such as smartphones and tablets can also mine cryptocurrency. However, mining has very negative effects on mobile devices and tablets. Mining cryptocurrencies via a mobile device requires a significant amount of computing power, which can drain the device's battery life and reduce its overall performance. The high demand for computing power can cause the device's CPU and GPU to operate at full capacity, resulting in increased heat generation and possible damage to device components. Additionally, mobile devices are not designed to handle the heavy workload associated with cryptocurrency mining. This increases stability and reliability, as well as increased risks such as hardware failures or other issues.

Another impact of the cryptocurrency mining problem on the mobile platform is the increased security risks. Cryptocurrency mining also requires the use of specialized software that may be vulnerable to security threats such as malware or viruses. Users participating in mobile mining are at greater risk of security threats, especially if they download and use untrusted software.

In addition, the cryptocurrency mining problem has also led to the creation of malicious applications that secretly mine cryptocurrencies on mobile devices without the user's knowledge or consent. Malicious applications can seriously damage the device's battery life and performance, as well as endanger the user's personal data.

Looking at the cryptocurrency mining problem from another angle, investors who realize that cryptocurrency mining is just as inexpensive as purchasing computer products are tried to earn passive income by stocking up on computer products used as daily necessities. On the other hand, with the stockpiling of so many phones, the devices used in mining, which lost their functions, created a big technological waste problem. Due to stockpiling, people who do not have a good financial situation and need a phone had a hard time finding some lower and middle segment phone models. We can give examples of mid-segment phones such as the Redmi 8 of Samsung and Xiaomi brands.

As a result, the mining issue has had a significant impact on the mobile platform. Stock shortages have negatively affected the phone's battery life, performance, stability and security. Mining has also caused some smartphone manufacturers to have problems in stock production. All we can say is the mobile miners need to be aware of the potential risks.

Figure 17

Multiple Smartphone



Source: (DÜNYA, 2018, February 23)

“Global sales of smartphones fell in the fourth quarter of 2017 for the first time since 2004” (DÜNYA, 2018). The booming smartphone market was hit first by the rising chip costs due to the Mining shortage.

Table 1*Smart Phone Selling Market Share*

Vendor	2018 shipments (million)	2018 Market share	2017 shipments (million)	2017 Market share	Annual growth
Samsung	293.7	21.2%	316.6	21.8%	-7.2%
Apple	212.1	15.3%	215.8	14.8%	-1.7%
Huawei	206.0	14.8%	153.2	10.5%	+34.5%
Xiaomi	120.3	8.7%	91.4	6.3%	+31.6%
Oppo	119.6	8.6%	112.0	7.7%	+6.9%
Others	436.1	31.4%	566.2	38.9%	-23.0%
Total	1,388	100.0%	1,455	100.0%	-4.6%

Source: (HABERTÜRK, 2019, January 30)

“The global smartphone market contracted for the fifth quarter in a row. In 2018, total smartphone sales decreased by 4.6 percent from 1 billion 455 million to 1 billion 388 million” (HABERTURK, 2018). Although the mining problem seems to be a stock problem for the mobile platform, smartphone manufacturers could not reach the sales figures they wanted by the needy customers due to the increasing processor production costs. The reason why those in need do not make purchases is based on the increasing cost of technological products since the last quarter of 2017.

Apple, known as the world's largest smartphone company, survived the cryptocurrency mining problem with a loss of 1.7%. The reason why Apple's loss is so low is that the IOS systems it uses are not very suitable for mining. We can also relate Apple's low loss to its policy of focusing on a single model every year.

Despite the high phone sales rates of brands such as Huawei, Xiaomi and Oppo because they were new in the market, the phone industry experienced a 4.6% decrease. What we can understand from here is that they could not meet the growth rates that Samsung, Apple and other brands lost (HABERTURK, 2018).

2.1.2. The Effect of Cryptocurrency Mining Problem on PC Platform?

The rise of cryptocurrency mining has had a significant impact on the PC platform. It has also greatly impacted the availability and pricing of graphics processing units (GPU), which are key components for cryptocurrency mining. Rising prices and stock shortages for the PC industry have caused a number of problems, such as reduced availability of GPUs for computer users.

Cryptocurrency mining is the use of powerful computer systems to create new cryptocurrencies and solve complex mathematical equations. GPUs are the primary components used for mining as they offer high computing power and efficient energy consumption. Therefore, miners bought large quantities of GPUs, leading to higher prices and component shortages.

The high demand of miners for GPUs has led to a shortage and reduced availability of computer components for PC users such as gamers and professionals. This has led to frustration among consumers who can't find the GPUs they need to build or upgrade their systems, resulting in longer wait times and increased competition for existing components.

Increasing demand for GPUs has also led to higher prices for computer components. Manufacturers have had to raise prices to offset the additional costs associated with purchasing limited computer components and to take advantage of the increased demand from miners. Increases in prices have made it more difficult and expensive for gamers and other computer users to purchase GPUs, especially high-end models.

In addition, the cryptocurrency mining problem has also led to an increase in the number of fake and imitation GPU models on the market. Swindlers, took advantage of GPU demand by selling fake or low-quality imitations to unsuspecting customers. Counterfeiting has created additional difficulties for computer users trying to find reliable and high-quality computer components.

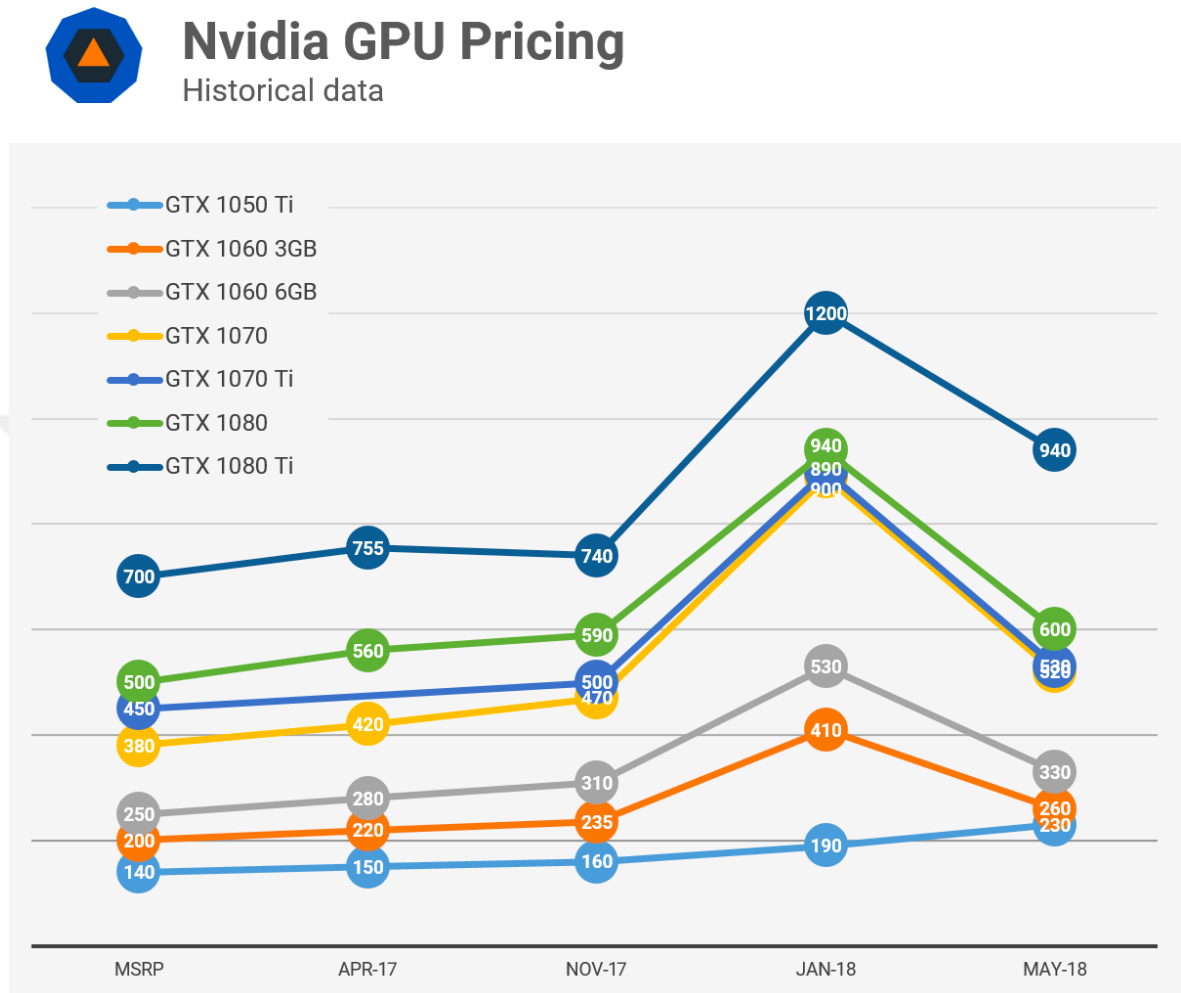
As a result, the cryptocurrency mining problem has had significant effects on the PC platform. Unnecessary use of GPUs has made it difficult for the needy to access GPUs and has led to an increase in prices. Today, the effects we have described are still felt, albeit slightly.

Table 2*Graphics Cards Price*

	MSRP	April 2017	November 2017	January 2018	Current Typical (May 2018)	Current Best (May 2018)
GeForce GTX 1050 Ti	\$140	\$150	\$160	\$190	\$230	\$190
GeForce GTX 1060 3GB	\$200	\$220	\$235	\$410	\$260	\$230
GeForce GTX 1060 6GB	\$250	\$280	\$310	\$530	\$330	\$300
GeForce GTX 1070	\$380	\$420	\$470	\$890	\$520	\$470
GeForce GTX 1070 Ti	\$450		\$500	\$900	\$530	\$500
GeForce GTX 1080	\$500	\$560	\$590	\$940	\$600	\$550
GeForce GTX 1080 Ti	\$700	\$755	\$740	\$1,200	\$940	\$900
Radeon RX 550	\$80	\$80	\$100	\$120	\$145	\$115
Radeon RX 560 16CU	\$100		\$130	\$140	\$160	\$140
Radeon RX 570	\$170	\$190	\$250	\$540	\$330	\$260
Radeon RX 580 8GB	\$230	\$260	\$310	\$660	\$350	\$300
Radeon RX Vega 56	\$400		\$450	\$670	\$600	\$600
Radeon RX Vega 64	\$500		\$505	\$800	\$750	\$700

Source: (Techspot, 2018, May 15)

Cryptocurrency mining problem emerged towards the end of 2017 and deeply affected the prices of the models of the two giant brands that are graphics cards manufacturers. As a result of these changes in prices, users who wanted to buy the products could not get the graphics cards they wanted due to the price increases of up to 50-60%, due to the high demand. Radeon RX Vega 64, one of the most powerful graphics cards of 2018, showed a price increase from \$ 500 to \$ 800 in just 3 months. In addition, the 1060 and 1070 models, the price performance product of NVIDIA's best-selling graphics cards of the time, also shared the same fate in a worse way. While the 1070 6GB version is priced at \$380, it goes up to \$890 (Schiessser, 2018).

Figure 18*Nvidia GPU Pricing*

Source: (Techspot, 2018, May 15)

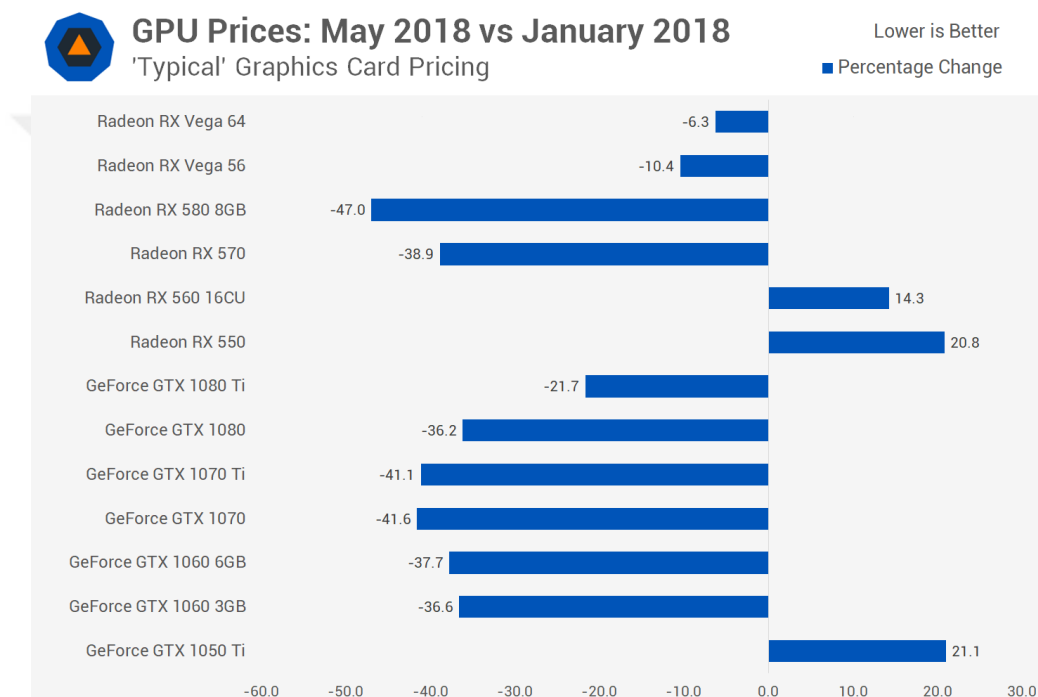
“Looking at the percentage change in pricing illustrates how the market has changed from January to today. Mid to upper-end graphics cards have dropped in price by 35% to 45% in a couple of months, while Vega cards are roughly 10% cheaper and the GTX 1080 Ti has dropped by 22%. Meanwhile, more mainstream offerings have increased by as much as 21%.” (Schiessser, 2018)

Although the graphics card market experienced a decrease in the sales of large and medium segment products, an increase was observed in the sales of the lowest class products despite the price increases. The reason for the increase in sales figures

in low segment products may be due to the fact that graphics card miners turned to low segment computer components after price increases in mid and high segment computer components. Furthermore, it seems likely that people who dream of a new computer may be influenced by price increases and turn to lower class graphics cards.

Figure 19

GPU Prices: May 2018 vs January 2018



Source: (Techspot, 2018, May 15)

2.1.3. The Effect of Cryptocurrency Mining Problem on Console Platform?

The growth of cryptocurrencies such as Bitcoin and Ethereum in recent years has led to an increased demand for high-end graphics processing units (GPUs) used in cryptocurrency mining. The increase in demand has led to GPU shortages, making it difficult for gamers and other users to purchase computer products at reasonable prices.

The cryptocurrency mining issue has also affected the console platform. Processors such as NVIDIA Tegra used in the console, especially the Nintendo Switch, were affected by the lack of components. Nintendo struggled to meet the high demand for Nintendo Switch, which has become one of the most popular consoles of recent years. The company has delayed the release of some games due to a lack of components. Therewithal, customers had to pay very high prices to buy Nintendo Switch.

The cryptocurrency mining issue has also affected other console manufacturers. Sony and Microsoft even reported difficulties in sourcing components for their latest consoles, PlayStation 5 and Xbox Series X/S. While it's not just the lack of a GPU that causes such difficulties, it's certainly an important factor.

In addition to its impact on console manufacturers, the cryptocurrency mining issue has had much broader implications for the tech industry. It should also be underlined that more investment in semiconductor manufacturing capacity is required, especially in light of the global chip shortage affecting a wide range of industries.

As a result, the issue of cryptocurrency mining has had a significant impact on the console platform, especially in terms of the availability and pricing of components such as GPUs and processors. While the lack isn't the only factor among the main causes of difficulties console manufacturers are facing, it certainly has had a significant impact. The cryptocurrency mining problem has also brought to light the need for more investment in semiconductor manufacturing capacity to enable the technology industry to meet the growing demand for components in the coming years.

Figure 20

Console Mining System with 16x PS4 Slim



Source: (Wong, A. 2021, March 10)

As seen in Figure 20. this system, which consists of 16 PS4 Slim made by miners, is used by a single person as a passive income source instead of 16 people in need and are widely used in the crypto currency market (Wong, A. 2021, March 10)

2.2. The Effect of COVID-19 and Mining Problem on The Chip Crisis

In this section, COVID-19 and Cryptocurrency mining that caused the chip crisis will be defined and discussed.

2.2.1. The Effect of COVID-19 on The Chip Crisis

The COVID-19 pandemic has had a significant impact on the global and semiconductor chip shortage that has persisted since 2020. If we talk about some of the reasons why the pandemic affected the chip crisis:

Increasing Demand for Electronics: During the pandemic, there has been an increase in demand for electronic products, including laptops, phones, tablets, game consoles and other devices, as people begin to spend more time at home.

Supply Chain Disruptions: The pandemic has disrupted global supply chains, making it difficult for semiconductor manufacturers to obtain the raw materials they need to manufacture chips. This caused delays in production and reduced production

Closing of Factories: Many semiconductor manufacturers have had to temporarily or permanently close their factories due to the pandemic. Temporary or permanent shutdowns have resulted in reduced production capacity and further delays in the supply chain.

Delays in Shipping: The pandemic has also caused delays in shipping, with many countries imposing restrictions on travel and transportation to slow the spread of the virus. Delays in shipping have made it difficult to transport semiconductors and other electronic components from manufacturers to consumers.

2.2.2. The Effect of Mining Problem on The Chip Crisis

The cryptocurrency mining problem refers to the high demand for high-end graphics processing units (GPUs) caused by the growth of cryptocurrencies such as Bitcoin and Ethereum which require significant computational power for mining new coins. High demand for GPUs has contributed to the ongoing global chip crisis which has affected a wide range of industries that rely on semiconductor components.

The chip crisis has been driven by a combination of factors including the COVID-19 pandemic, supply chain disruptions and increased demand for electronics as more people work and study from home. The cryptocurrency mining problem was

also added to the demand as cryptocurrency miners have competed with other industries for access to the same limited supply of high-performance GPUs.

Increased demand for GPUs has led to shortages and price hikes as manufacturers struggle to keep up with demand. The shortage of GPUs has also impacted other industries that rely on them including the gaming and data center industries. The demand has led to delays in the release of new products, higher prices for existing products and reduced availability of critical components.

In addition, the mining problem has highlighted the need for greater investment in semiconductor manufacturing capacity. The chip crisis has shown that the global supply chain for semiconductor components is fragile and susceptible to disruption. The global supply chain is fragile and vulnerable to disruption leading to calls for increased investment in local chip manufacturing as well as efforts to diversify supply chains to reduce reliance on a single region or supplier.

In conclusion, the cryptocurrency mining problem has had a significant impact on the ongoing chip crisis contributing to shortages, price hikes and delays in the release of new products. The mining problem has also highlighted the need for greater investment in semiconductor manufacturing capacity and diversification of supply chains to mitigate the impact of future disruptions.

2.3. Definition of The Term ‘COVID-19’

COVID-19, also known as coronavirus disease, severe acute respiratory syndrome, is a highly contagious respiratory disease caused by coronavirus 2 (SARS-CoV-2). The virus first appeared in Wuhan, China, at December 2019 and has since spread rapidly around the world, causing a global epidemic.

The primary route of transmission is respiratory droplets that an infected person expels from their mouth when they cough, sneeze, talk or breathe. The disease can also be spread by people touching their own face, nose, or mouth after touching contaminated surfaces.

COVID-19 symptoms vary from person to person. Infected people may experience mild or severe symptoms. Symptoms of COVID-19 can appear 2 to 14

days after exposure to the virus. Common symptoms are fever, cough, fatigue, body aches, loss of taste or smell, sore throat and shortness of breath. Some people may rarely experience gastrointestinal symptoms such as diarrhea and vomiting unlike the common symptoms.

COVID-19 can affect people of all ages. Certain groups of people are at higher risk of serious illness and death, especially older adults, people with underlying medical conditions and people with compromised immune systems. Unfortunately, COVID-19 can also cause serious illness and even death in young and healthy individuals.

Currently, there is still no specific solution or treatment for COVID-19, only supportive care can relieve symptoms. Vaccines have been developed and authorized for emergency use to prevent COVID-19 infection and reduce disease severity. Until enough people are vaccinated to achieve herd immunity, it is important to continue to implement preventive measures such as wearing masks, maintaining social distance, washing hands frequently, and avoiding large gatherings. The COVID-19 pandemic has had significant global impacts, including an increase in deaths and hospitalizations, economic recession and disruptions to education and daily life. Countries around the world have sought to take various measures to control the spread of the virus including lockdowns, travel restrictions, mass testing and contact tracing. It is also important to stay up to date with the latest developments and guidelines regarding COVID-19 to protect ourselves and others from the virus.

2.3.1. The Effect of COVID-19 on Mobile Platform?

Additionally, the pandemic has resulted in increased demand for mobile devices as people around the world have had to adapt to working from home, online learning and socialization. This has increased demand for laptops, tablets and smartphones as people try to stay connected to their work, school and social networks. Rising demand has put pressure on manufacturers to increase production even as they deal with supply chain disruptions. The pandemic has also had a significant impact on the way people use their mobile devices. With quarantines and social distancing measures implemented, people began to spend more time at their houses. Thus, it has

led to more use of mobile devices for entertainment and communication. There has been an increase in the use of video streaming services, social media apps and messaging apps as people seek ways to have fun and stay connected while staying indoors. In addition, the pandemic has made mobile health technologies such as telemedicine and health monitoring applications very widespread among the public. With face-to-face medical appointments and check-ups interrupted due to the pandemic, people have turned to mobile devices to monitor their health, track their symptoms, and consult medical professionals remotely.

As a result, the COVID-19 pandemic has had a significant impact on the mobile platform, affecting the production, demand and use of mobile devices. As the pandemic continues, the mobile platform has played a critical role in keeping people connected, positive and healthy. Manufacturers and suppliers have had to continue to adapt to the changing demands and challenges of the pandemic to ensure that the mobile platform continues to be an essential device for people around the world.

The COVID-19 pandemic has had a significant impact on the mobile gaming industry. If we talk about some of the reasons how the pandemic affected the mobile games:

Increased Use: With quarantines and social distancing measures in place, people spent more time at home and turned to mobile games for entertainment. As a result, there has been an increase in the use of mobile games.

Change in Gameplay Patterns: The pandemic has also brought about changes in the way people play mobile games. With more people starting to play games, there has been an increase in multiplayer games and games that allow for social interaction. Additionally, as people's schedules have become more flexible, there has been an increase in gaming during off-peak hours.

New Changes in Development: The pandemic has affected mobile game development. The fact that game studios had to work from home online slowed the development process. This caused delays in game releases and updates.

Increased Income: Despite the difficulties brought by the pandemic, the mobile gaming industry continued to generate significant revenue. Mobile gaming revenue has increased as more people play games and spend more time on their devices.

Challenges for Junior Developers: The pandemic has created challenges for junior mobile game developers who are new to game development. With limited resources and a more competitive market, some junior developers struggled to stay on the market during the pandemic.

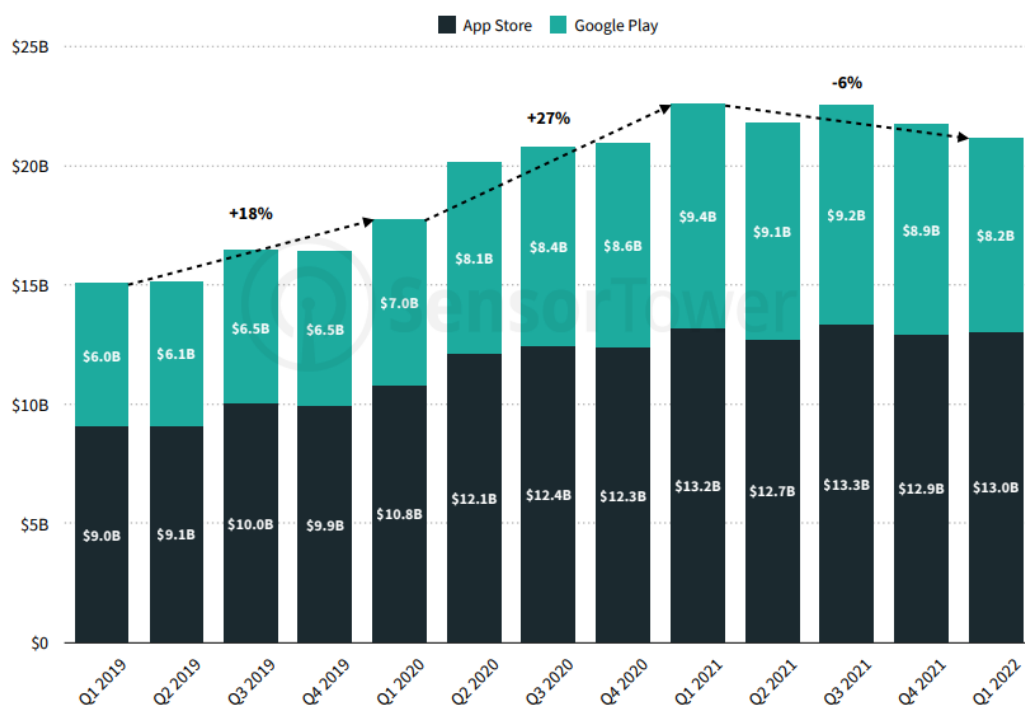
Overall, the COVID-19 pandemic has led to an increase in mobile game revenue, along with changes in mobile game development and usage patterns. While the industry is facing challenges, mobile games have provided a source of entertainment for many.

Figure 21

After COVID-19 Global Game Revenue Declines

After COVID, Global Game Revenue Declines for the First Time

Worldwide quarterly consumer spending in mobile games on the App Store and Google Play



Market Overview: Worldwide

Source: (Sensor Tower, 2022)

When COVID-19 first appeared, people started to spend more time with devices such as phones and tablets that they already use in their daily lives, due to the fact that people were locked in their homes. As we see in Figure 21, the biggest impact of this is in 2020 q1 and q2, which is the period when COVID-19 is most common. App installs increased by 27%. Later, the chip crisis caused by the high demand for electronic devices caused a 6% decrease (Sensor Tower, 2022).

2.3.2. The Effect of COVID-19 on PC Platform?

One of the most significant impacts of the COVID-19 pandemic on the PC platform is disruptions in the global supply chain. The quarantine of countries, the closure of production facilities have caused significant delays in the manufacture and delivery of computer components. Delays in production and deliveries have led to a drastic reduction in the market for some components, such as microchips, which are crucial to the operation of modern computers. These shortages caused delays in the manufacture and shipping of computers, resulting in higher prices and a rarity in certain models.

In addition, due to the pandemic, people around the world have started working and learning online from home, which has led to an increased demand for personal computers. When offices and schools are closed, people had to rely on their personal devices for communication, collaboration and productivity. This has led to an increase in the demand for laptop and desktop computers due to the necessity of people to continue their work and education.

The increase in demand for computers has also led to changes in the types of devices people buy. With online working and learning, people have started to look for powerful and reliable even portable devices. This pursuit has resulted in increased demand for gaming laptops, ultrabooks and other high-end computers that can handle demanding tasks such as video conferencing and data analysis.

The pandemic has also changed the way people use their computers. With more people working and learning online, cloud-based services and digital

collaboration tools are becoming widely available. There has also been an increase in the use of tools such as video conferencing applications, cloud storage solutions and online productivity as people adapt to new ways of working and learning.

As a result, the COVID-19 outbreak has had significant effects on the PC platform. Production, sales and use of the PC Platform have been impacted by COVID-19. As the pandemic continues, the PC platform has played a critical role in keeping people connected, productive and informed.

Furthermore, manufacturers and suppliers have had to ensure that the PC platform remains an essential tool for people around the world and continue to adapt to the challenges posed by the changing demands of the pandemic.

The COVID-19 pandemic has had a significant impact on the PC gaming industry. If we talk about some of the reasons how the pandemic affected the PC games:

Increasing Demand: With the quarantine and social distance measures, people started to spend more time at home and turned to PC games for entertainment. This trend has also led to an increase in demands for computer gaming hardware and software.

Increased Game Sales: The pandemic has caused an increase in game sales on the PC platform. With more people playing games and staying home, the demands for new and existing PC games have increased.

Increased Online Play: The pandemic has led to an increase in online gaming on the PC platform. For people stuck at home, online games have become a popular way to meet friends.

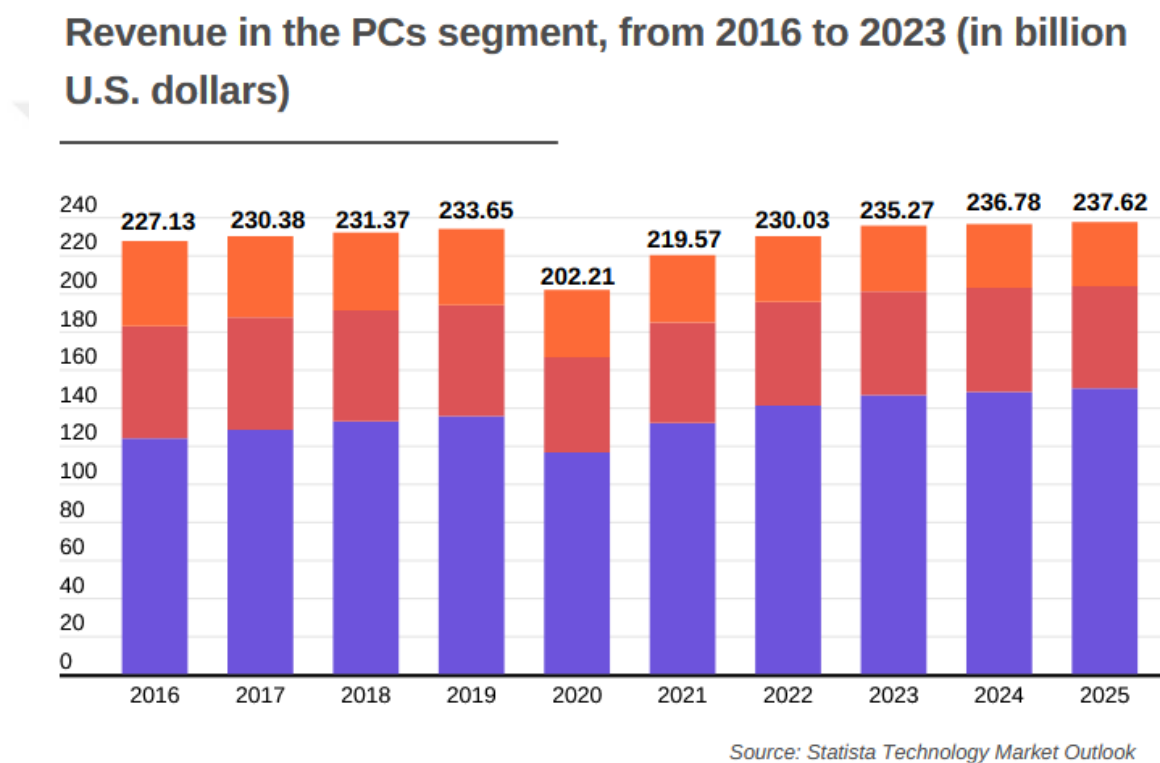
Remote Work: The pandemic has led to an increase in working from home, which has also affected the PC gaming industry. COVID-19 has also caused delays in game development and updates as many game studios have had to switch to remote work.

Supply Chain Interruptions: The pandemic has caused disruptions in the PC gaming hardware supply chain. This disruption caused delays about the production and distribution of PC gaming components.

Overall, the COVID-19 pandemic has led to increased demand for PC games, game sales, and online games. At the same time, the pandemic caused the globalization of remote work, disruptions in the supply chain and delays in game development.

Figure 22

Revenue in The PC Platform from 2016 to 2023



Source: (Statista Technology Market Outlook, 2020, December 2)

As can be seen from Figure 22. there has been a great decline in the PC platform with the emergence of COVID-19. Although the loss of income caused by this decrease is tried to be eliminated in 2021, as a result of the chip crisis caused by COVID-19 in 2021, it took 2 years for the PC Platform to recover itself after the big drop in 2020.

2.3.3. The Effect of COVID-19 on Console Platform?

One of the most significant impacts of the COVID-19 pandemic on the console platform is disruptions in the global supply chain. The quarantine of countries, the closure of production facilities have caused significant delays in the manufacture and delivery of computer components. This led to the lack of certain components, such as microchips, which are crucial to the operation of modern consoles. These shortages caused delays in the manufacture and shipping of computers, resulting in higher prices and a rarity in certain models.

Additionally, the pandemic has led to changes in the way people use their consoles. With more people staying at home all time, there has been an increase in the demand for gaming as a form of entertainment. The pandemic has also led to the cancellation of live events and gatherings, leading to increased reliance on online multiplayer console games for socializing. In addition, the pandemic has led to increased demand for digital game downloads and online subscriptions. There has been an increase in digital download and online subscription usage as people cannot physically purchase games or visit stores to purchase physical copies. This has led to a change in the way console manufacturers sell games and services, with a greater emphasis on digital distribution and online subscriptions.

The pandemic has also led to the delay of major console releases and game releases as development teams have had to adapt to remote working and social distancing measures. This has caused delays in the production and release of new consoles and games, affecting both manufacturers and consumers.

As a result, the COVID-19 outbreak has had significant effects on the console platform. Production, sales and use of the Console Platform have been impacted by COVID-19. As the pandemic continues, the PC platform has played a critical role in keeping people connected, productive and informed. Furthermore, manufacturers and suppliers have had to ensure that the console platform remains an essential tool for people around the world and continue to adapt to the challenges posed by the changing demands of the pandemic.

The COVID-19 pandemic has had a significant impact on the console gaming industry. If we talk about some of the reasons how the pandemic affected the console games:

Increasing Demand: As quarantines and social distancing measures have been implemented, people have spent more time at home and turned to console games for entertainment. This has resulted in increased demand for consoles and console games.

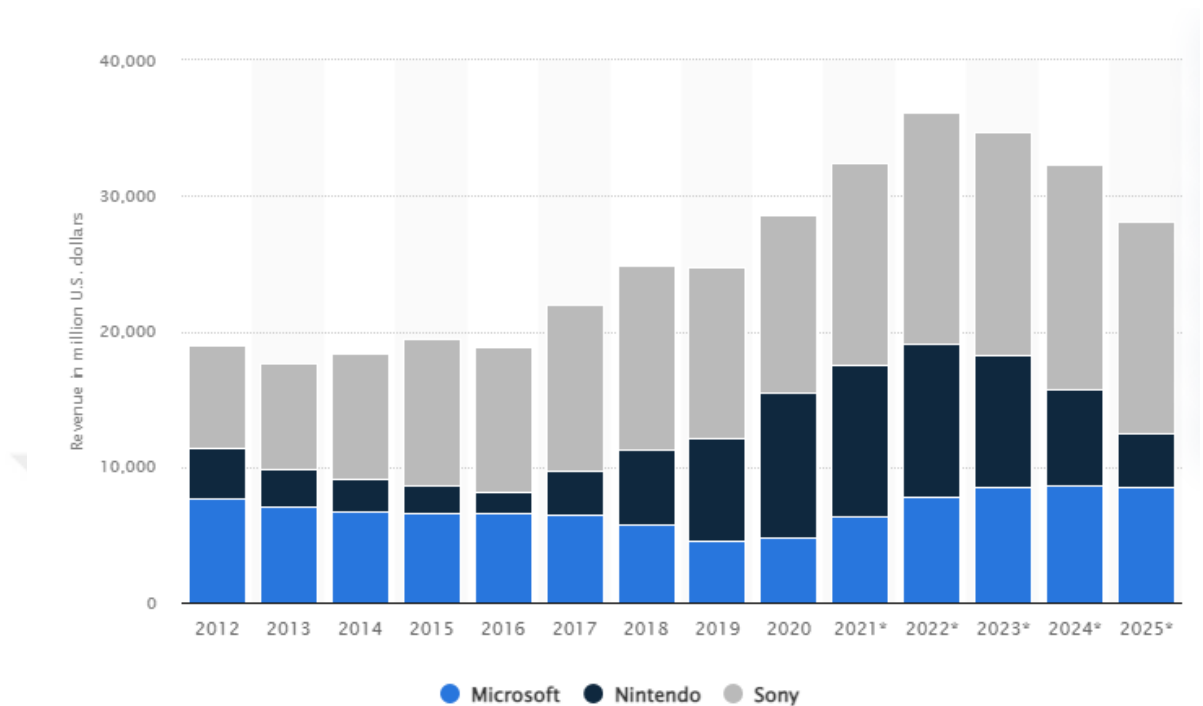
Delayed Hardware Releases: The pandemic has caused delays in the release of new console hardware. This has led to disappointment among gamers who were looking forward to the upgrade to the latest consoles.

Increased Online Play: The pandemic has led to an increase in online gaming on the console platform. For people stuck at home, online games have become a popular way to meet friends.

Remote Work: The pandemic has led to an increase in working from home, which has also affected the console gaming industry. COVID-19 has also caused delays in game development and updates as many game studios have had to switch to remote work.

Supply Chain Interruptions: The pandemic has caused disruptions in the console gaming hardware supply chain. This disruption caused delays about the production and distribution of console gaming components.

Overall, the COVID-19 pandemic has led to increased demand for console games, game sales, and online games. At the same time, the pandemic caused the globalization of remote work, disruptions in the supply chain and delays in game development.

Figure 23*Revenue in The Console Platform from 2012 to 2025*

Source: (Clement J. 2022, October 25)

Although COVID-19 has adversely affected the mobile and PC platforms, the color of things differs when we evaluate the console platform. Although the console platform faced similar negative effects with other platforms, when we came to the year-end graphics, there was no decrease in the console platform in terms of revenue and sales, on the contrary, there was a great increase. We can say that the biggest helpers of this rise are the new generation game consoles and console games released by Nintendo and Sony companies. These consoles, which are more effortless than other gaming platforms, have become devices that people can easily access at home during the COVID-19 quarantines. For these reasons, the console platform has completed the COVID-19 pandemic in 2020 with a rise (Clement J. 2022, October 25).

2.4. Definition of The Term ‘Chip Crisis’

The chip crisis, also known as the semiconductor shortage, is a global computer chip shortage affecting various industries, including automotive, consumer electronics, and medical devices. The shortage was caused by several factors, including increased demand for electronics during the COVID-19 pandemic, supply chain disruptions, and production slowdowns due to natural disasters. The pandemic has led to a surge in demand for electronic products including laptops, smartphones and game consoles as people move to remote work and online entertainment. This has made the already limited computer chips even more difficult to find. In addition, supply chain disruptions caused by curfews and travel restrictions have resulted in delays in chip production and delivery.

Another contributing factor to the chip crisis is production slowdowns caused by natural disasters such as severe winter storms and earthquakes. These events caused the temporary closure of chip factories and exacerbated the supply shortage.

The automotive industry was particularly affected by the chip crisis. The increasing use of computer chips in modern cars has led to a shortage of chips needed for various components, including power steering and braking systems. This caused production to slow and car factories around the world to close.

The chip crisis has also affected the medical industry with the shortage of chips needed for medical devices such as ventilators and CT scanners. This has raised concerns about its ability to respond to future outbreaks and medical emergencies.

To address the chip crisis, governments and companies have taken a variety of measures including increasing investment in chip manufacturing, accelerating the adoption of new technologies and increasing supply chain resilience. But these measures would take time to take effect and the chip shortage is expected to continue into 2024.

The chip crisis highlighted the importance of computer chips in modern society and the need for a more sustainable supply chain. The chip crisis also highlighted the risks associated with relying on a limited number of suppliers for critical components and the need to diversify in supply chains

2.4.1. The Effect of Chip Crisis on Mobile Platform?

The global chip crisis has had a significant impact on the mobile platform, affecting both the production and usability of mobile devices and their components. The chip crisis, which started in early 2020 and continues today, is the result of several factors, including the COVID-19 pandemic, trade disputes and natural disasters.

The operation of mobile devices such as smartphones and tablets is heavily dependent on microchips and other electronic components. The interruption of the supply of these components along with the chip crisis has led to production delays and device shortages. This has resulted in higher prices for consumers, longer wait times for pre-orders and limited availability of certain models. (düzenlendi)

The main reason why the chip crisis has increased so much is the COVID-19 outbreak. The pandemic has disrupted global supply chains as factories shut down or reduced capacity due to health concerns and restrictions. This has led to delays in the manufacture and shipping of components, including microchips.

In addition to the pandemic, trade disputes between major economies such as the US and China also contributed to the chip crisis. Disputes in trade led to tariffs and export restrictions, which further disrupted supply chains and slowed production.

Natural disasters, such as the severe winter storm in Texas in February 2021, also had an impact on the chip crisis. The storm caused power outages and shutdowns at several semiconductor factories, causing further delays in production.

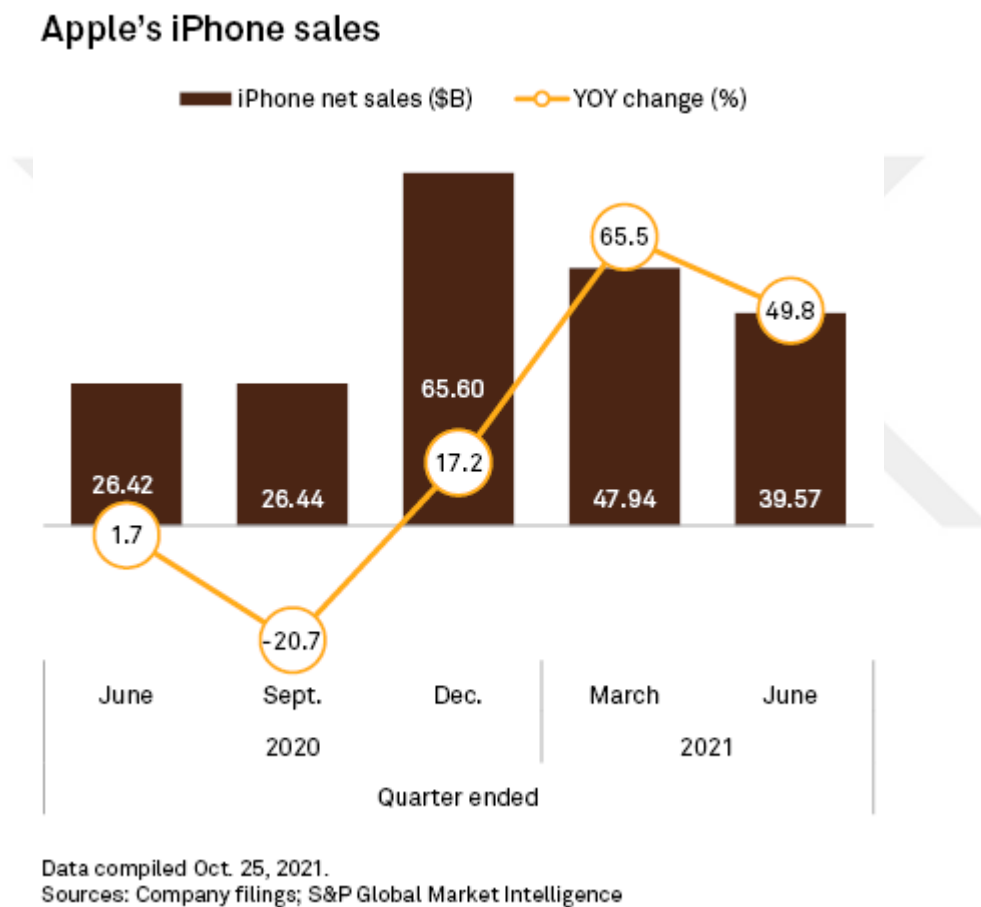
The chip crisis has had a significant impact on the mobile platform as mobile devices become more and more important for personal and professional use. Due to the limited availability of certain models, consumers have had to settle for less preferred devices or wait longer for the latest models. This has also impacted sales of mobile devices, with some manufacturers reporting lower sales rates due to component shortages.

As a result, the global chip crisis has had striking effects on the mobile platform, affecting the production, availability and sales of mobile devices. While the chip crisis is expected to ease in the coming months, the long-term impact on the

mobile industry is yet to be seen. Manufacturers and suppliers will need to work together to mitigate the effects of future disruptions in the supply chain and ensure the mobile platform continues to meet consumer demands.

Figure 24

Apple's iPhone Sales



Source: (Haider A. 2021, October 27)

As seen in figure 24, we see the decline experienced by Apple, one of the largest smartphone manufacturers, during the chip crisis. We can attribute this loss of Apple, which lost 20% of its sales value between 2019 and 2020, to the fact that Apple could not adequately supply its old models due to the chip crisis. In addition, we can say that Apple, which manages the chip crisis with a great strategy, has

managed to realize its new products quickly without delay in supply. As a result of this success, we can easily see that Apple has survived the chip crisis with minimum damage, with sales figures that increased by 17% in December 2019 data, together with new generation product sales (Haider A. 2021, October 27).

2.4.2. The Effect of Chip Crisis on PC Platform?

The global chip shortage has had a significant impact on the PC platform, affecting the production and availability of CPUs, GPUs and other computer components. While this has led to price increases, delays in production and delivery for the PC industry, it has also led to a number of problems, including limited availability of certain components.

The computer industry was hit particularly hard by the chip crisis due to the high demand for computer components from both consumers and businesses. Increasing demand for personal computers as a result of the COVID-19 pandemic has exacerbated the situation, leading to a significant shortage of semiconductors and other components.

One of the main effects of the chip crisis on the PC platform is the increase in the prices of computer components. Due to the limited supply of components, manufacturers had to raise prices to offset the additional costs associated with purchasing scarce components. This has made it more expensive for consumers to buy new computers, upgrade their existing systems or build new custom computers.

Another impact of the chip crisis on the PC platform is the delays in the production and delivery of components. As a result of the shortages, many manufacturers began to be unable to meet the demand for their products. The failure to meet the demands caused delays in the production of computer components. This has caused frustration among consumers who have waited a long time for their orders to arrive.

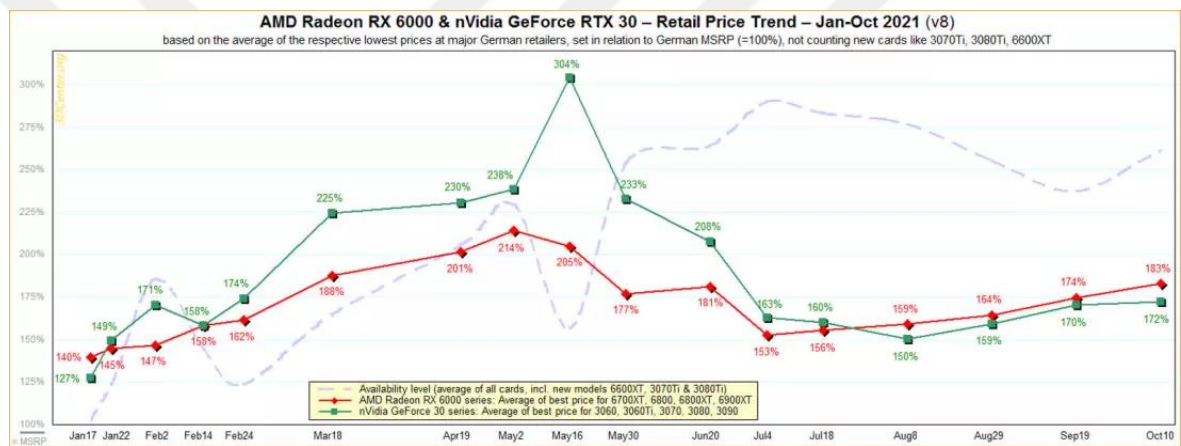
The chip crisis also resulted in limited availability of certain computer components. In some cases, certain devices are completely out of stock, making it difficult or impossible for consumers to purchase the parts they need to build or

upgrade their systems. This has led to increased competition for existing components, further increasing prices and exacerbating delays.

As a result, the chip crisis has had a significant impact on the PC platform. The chip crisis caused problems on the PC platform, such as price increases, production delays, and limited availability of certain devices. The effects of the crisis are likely to be felt for a while until the semiconductor supply chain is fully restored.

Figure 25

AMD and Nvidia Graphics Cards Prices



Source: (Islam Z. 2021, October 11)

The chip crisis that occurred with COVID-19 caused a second wave of rise in graphics cards, as we will see in the figure 25. This wave has been quite strong compared to the mining wave in 2018 with price increases of up to 300% observed in some models. Another reason for the wave is that Nvidia and AMD brand companies cannot produce enough graphics cards due to the lack of chips by releasing new graphics cards. As a result, users who wanted to access the PC platform could not get the PCs they wanted. It is thought that the chip crisis, which is still in effect, will lose its effect on the PC platform in the near future and there will be abundance in the most important parts of the PC, such as the graphic cards (Islam Z. 2021, October 11).

2.4.3. The Effect of Chip Crisis on Console Platform?

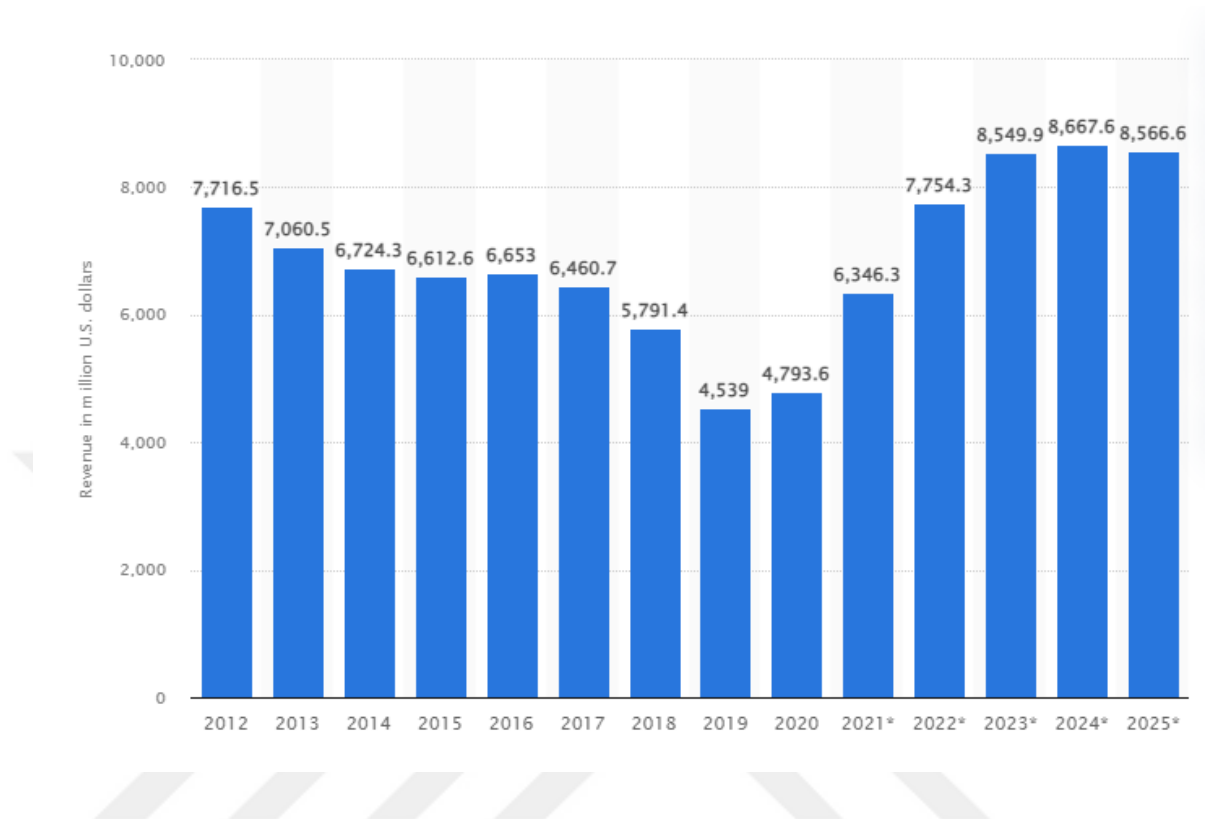
The console gaming industry has been hit hard by the global chip crisis, which has caused a shortage of semiconductors, microprocessors and other components required for the production of game consoles. This has resulted in production delays, increased prices and limited availability of game consoles, particularly the latest generation consoles such as the PlayStation 5 and Xbox Series X/S.

The shortage of semiconductors has disrupted the supply chain for Console gaming companies, causing them to struggle to meet the high demand for their products. For example, Sony and Microsoft had to limit their production of new consoles due to shortages. Limited production has resulted in long wait times and scaling by vendors.

The chip crisis has also affected the availability of other gaming components such as controllers, graphics cards and other gaming accessories, resulting in delayed deliveries of these products and increased prices.

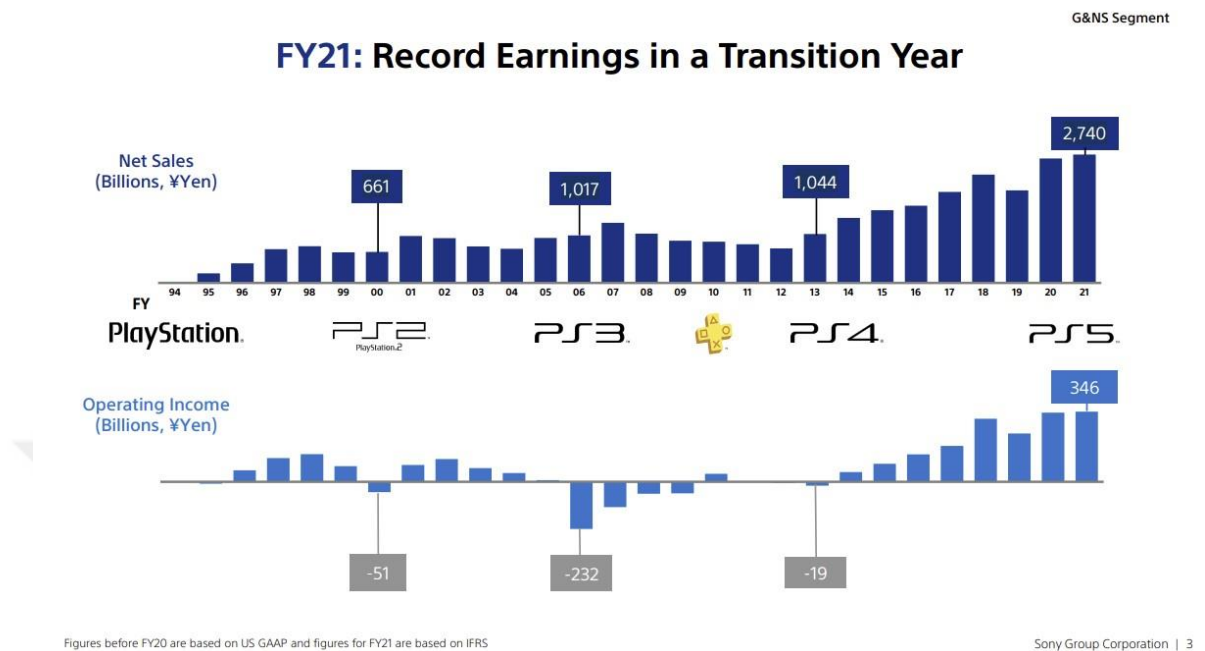
In addition, the shortage of semiconductors has increased the cost of production that Console game companies have to cover, causing an increase in the prices of game consoles. Price increases have created more barriers for gamers who want to upgrade their old consoles to the new model or own the latest generation consoles. The chip crisis has also caused a shortage of raw materials necessary for the production of semiconductors such as rare earth metals, which has affected the entire electronics industry including the gaming industry.

As a result, the chip crisis has had a significant impact on the Console gaming platform, causing delays and price increases. Also, the chip crisis has limited the availability of consoles and gaming accessories. It is likely that the effects of the crisis will be felt on the console platform for a while until the semiconductor supply chain is fully renewed.

Figure 26*PS and Xbox Consoles Revenue in 2012 to 2025*

Source: (Clement J. 2022, October 25)

As seen in figures 26. and 27. there has been a decrease in the sales of Playstation and Xbox game consoles. It can be said that the reason for this decrease is the long-awaited new generation consoles. In addition, an increase in sales figures was observed in 2020 as people who have been confined to their homes since the chip crisis and COVID-19 flock to new generation game consoles (Clement J. 2022, October 25).

Figure 27*FY21: Record Earning in a Transition Year*

Source: (Birney A. 2023, January 27)

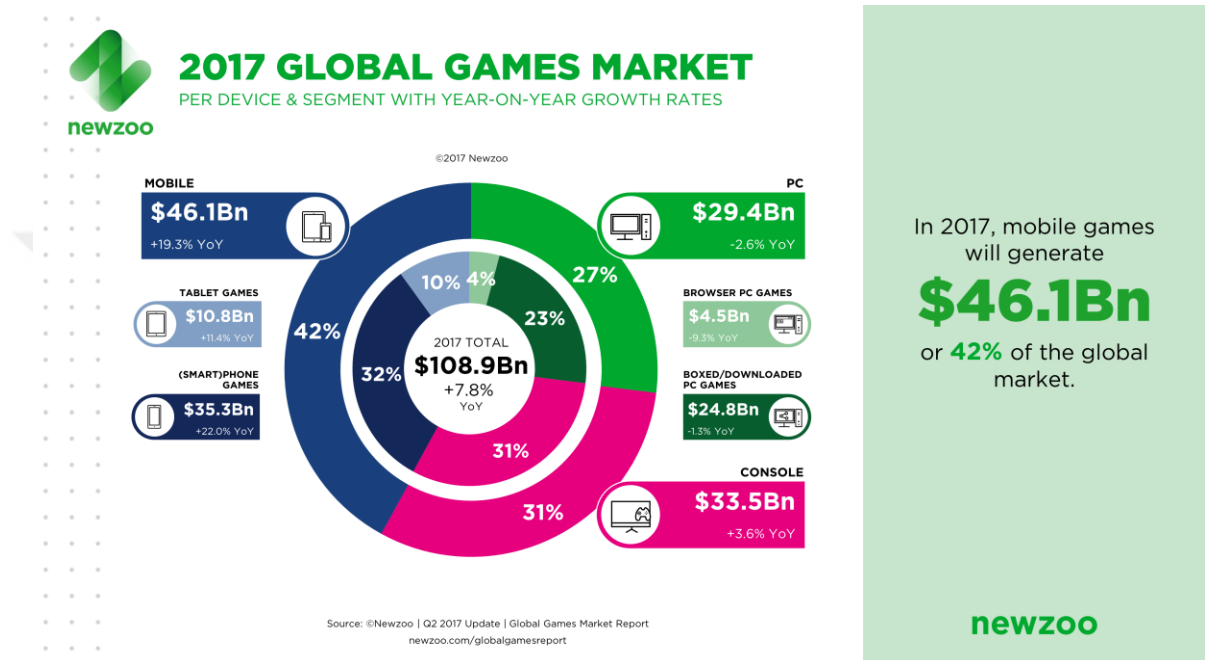
2.5. Global Gaming Market Year-to-Year Growth Rates and Interpretations 2017-2022

We will make a discussion and comment on the game platform between the years 2017-2023, as a result of the changes in the income levels of each platform from year to year.

2.5.1. Global Gaming Market Year-to-Year Growth Rates and Interpretations 2017

Figure 28

Global Games Market Growth Rates 2017

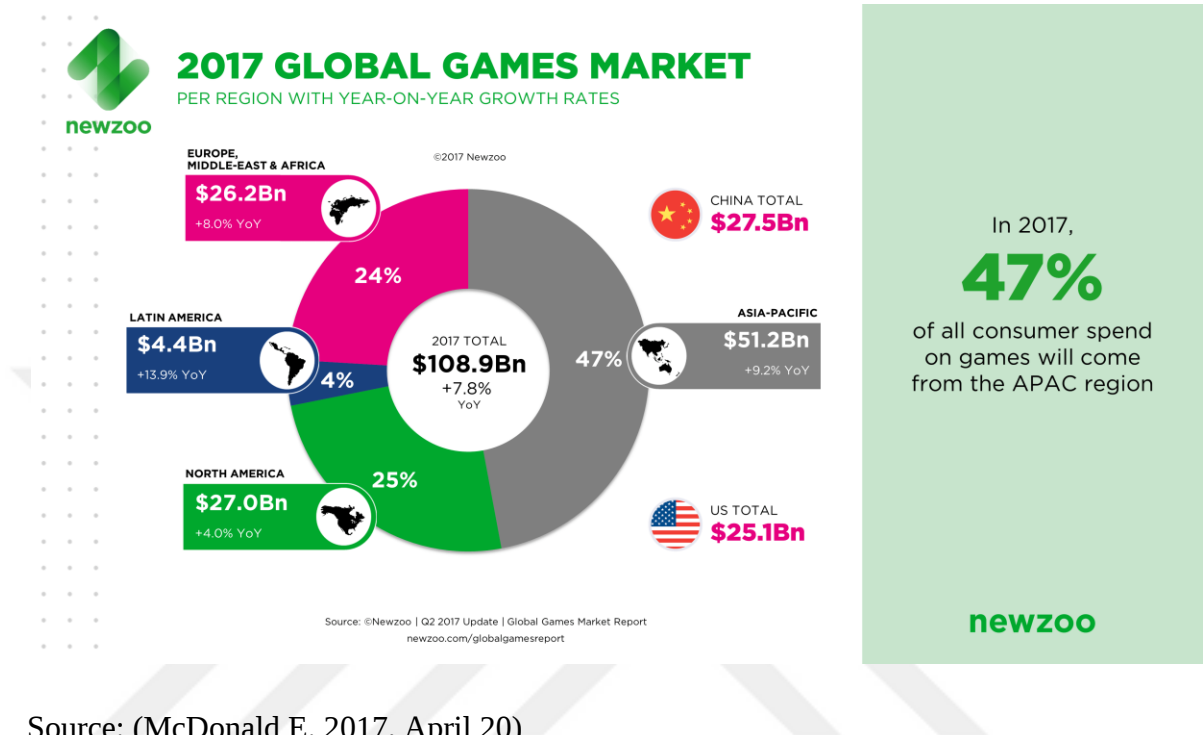


Source: (McDonald E. 2017, April 20)

The cryptocurrency mining problem, which took place towards the end of 2017, has affected many sectors, especially PC and mobile platforms. Despite the decline in smartphone sales, which have increased since 2004, the mobile game platform has managed to get rid of the chip crisis with a great rise as the mobile game industry and a growth of 19.3% has been observed. In addition, the PC platform, which was hit hard by the cryptocurrency mining problem, suffered a -2.6% loss as a result of stock shortages and increasing high prices of an important part such as the graphics card. The mobile platform, which gained a share as much as the majority of this share lost by the PC platform, has proven how strong it is among the platforms.

Figure 29

Global Games Market Region Growth Rates 2017



Source: (McDonald E. 2017, April 20)

If we look at how effective cross-platform games are on a continent basis in 2017, we can observe that Asian people make up half of the global gaming industry. On the other hand, with a 29% share, America has \$31bn revenues. We can say that the majority of Asia's share comes from China. China has a larger revenue than the United States, with \$27bn. If we look at the situation in Europe, we can see that it has a share close to America.

Figure 30

Chinese Games Market 2013-2020



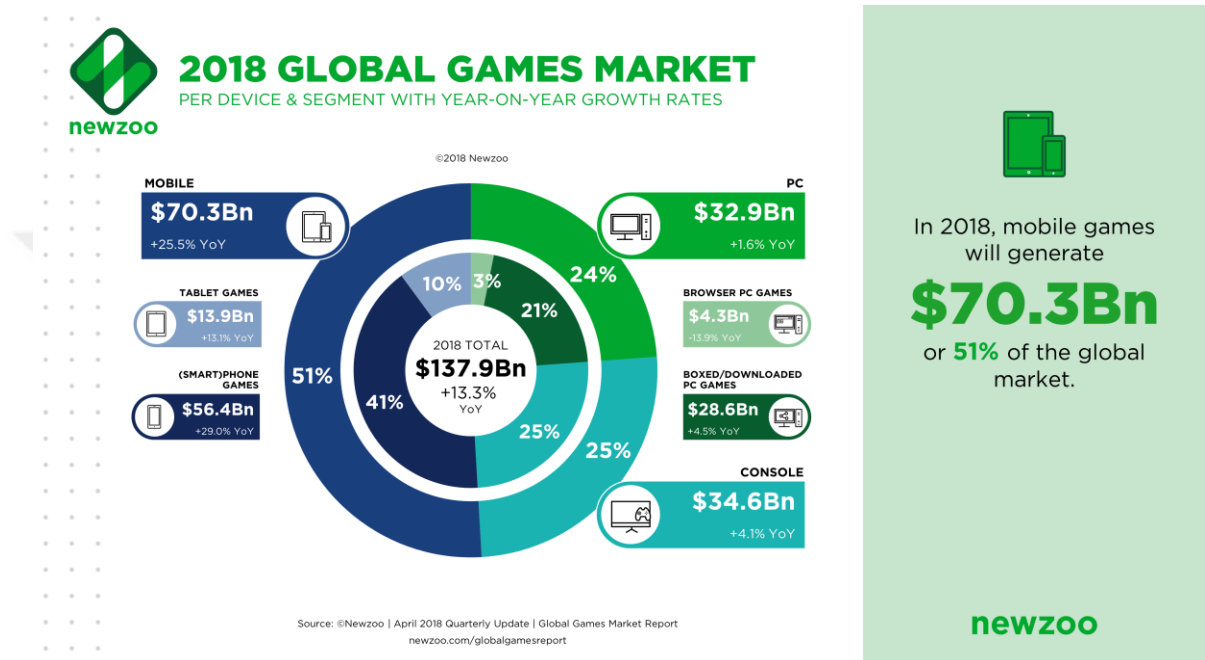
Source: (McDonald E. 2017, April 20)

It is seen that China, which makes up almost half of the world gaming industry, continues on its way without any problems in issues such as the cryptocurrency mining problem. It can be said that one of the biggest reasons why the cryptocurrency mining problem did not affect China is that China has a large number of labor force that is open to production and has a low cost. As long as the mobile sector of the Chinese game industry continues to grow and increase a large share as a result of the forecasts from 2013 to 2020, the mobile game platform will continue to develop and grow in direct proportion to the Chinese mobile industry.

2.5.2. Global Gaming Market Year-to-Year Growth Rates and Interpretations 2018

Figure 31

Global Games Market Growth Rates 2018



Source: (Wijman T. 2018, April 30)

Looking at the annual revenues of gaming platforms, the mobile gaming platform has increased its revenue by 25% compared to the previous year with a sales figure of \$70bn, however, it has shown that mobile is the largest platform by increasing its market share by 51%. Looking at the PC platform, it has an income of \$32bn, while the PC platform, which has a 24% share in terms of game market share, has an increase of 1.6%. Although \$4.3bn of this value comes from web games, a decreasing revenue is observed in web game sales compared to last year. On the other hand, in the downloadable game sales type, a sales increase of 4.5% is seen with a sales of 28bn dollars. When we look at the sales figures of the general PC platform, a 3% share loss is seen in the general share. Finally, if we talk about the console

platform, the console platform has reached \$34 Billion revenue level with an increase of 4.1% compared to the previous year. The console platform has lost a large percentage of the gaming platform. The majority of this went to the mobile gaming platform, which increased its share in the gaming industry by 10% (Wijman T. 2018, April 30).

Figure 32

Global Games Market Revenues per Platform Growth Rates 2012-2021

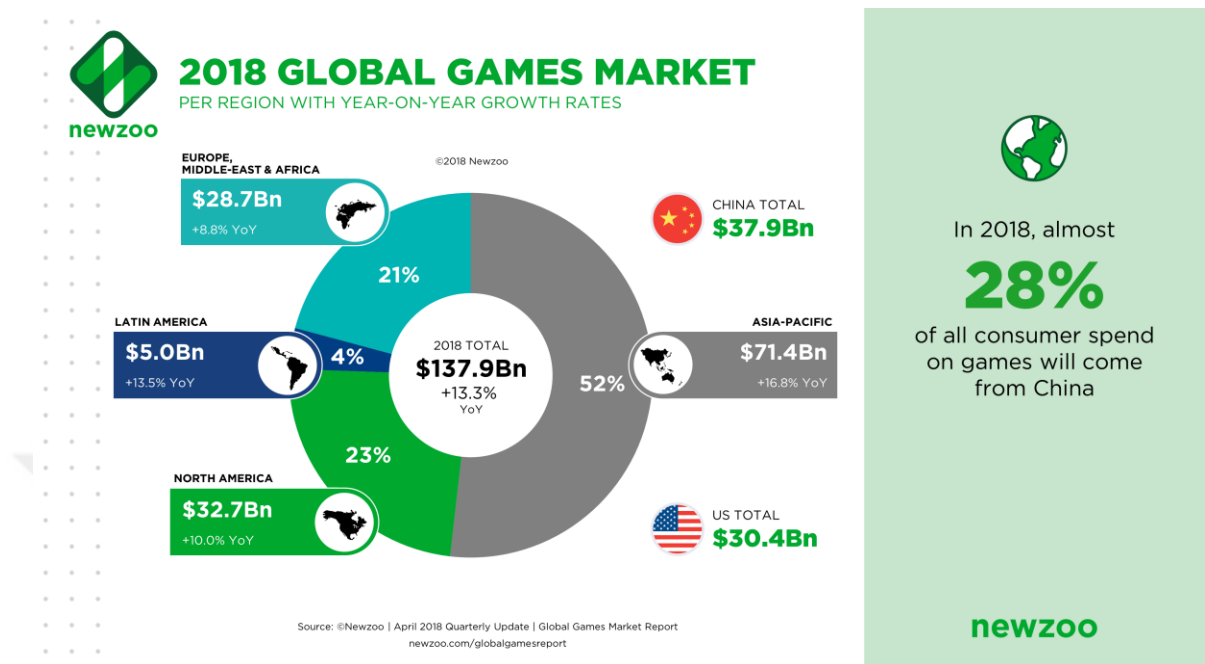


Source: (Wijman T. 2018, April 30)

According to the estimated data between 2012-2021, if the game world continues to grow at this rate, it is predicted that the industry, especially mobile games, will grow in the near future. But due to problems such as COVID-19 and chip crisis, there have been many changes in these situations.

Figure 33

Global Games Market Region Growth Rates 2018



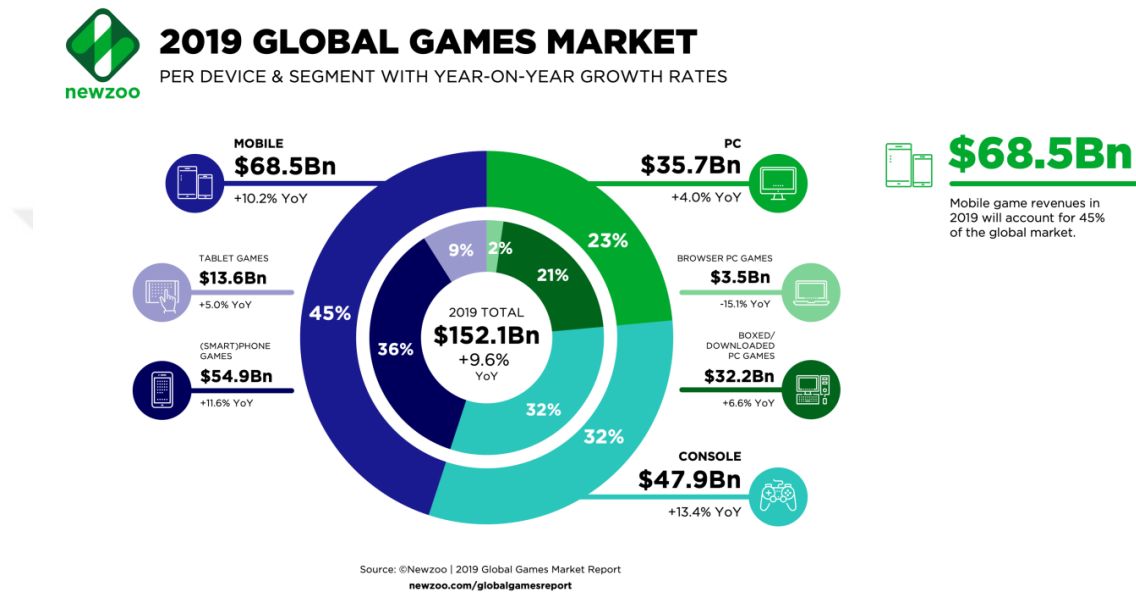
Source: (Wijman T. 2018, April 30)

According to the country distribution in 2018, a 5% growth in the Asian region and a 2% loss in the European and American regions are observed. Despite this loss of share, Europe and America showed growth in terms of clients. This is due to the rapid rise of China towards a large mobile platform, as seen in figure 33. When we look at the annual change basis, a growth of 13.3% is a harbinger of a very good future for mobile sector (Wijman T. 2018, April 30).

2.5.3. Global Gaming Market Year-to-Year Growth Rates and Interpretations 2019

Figure 34

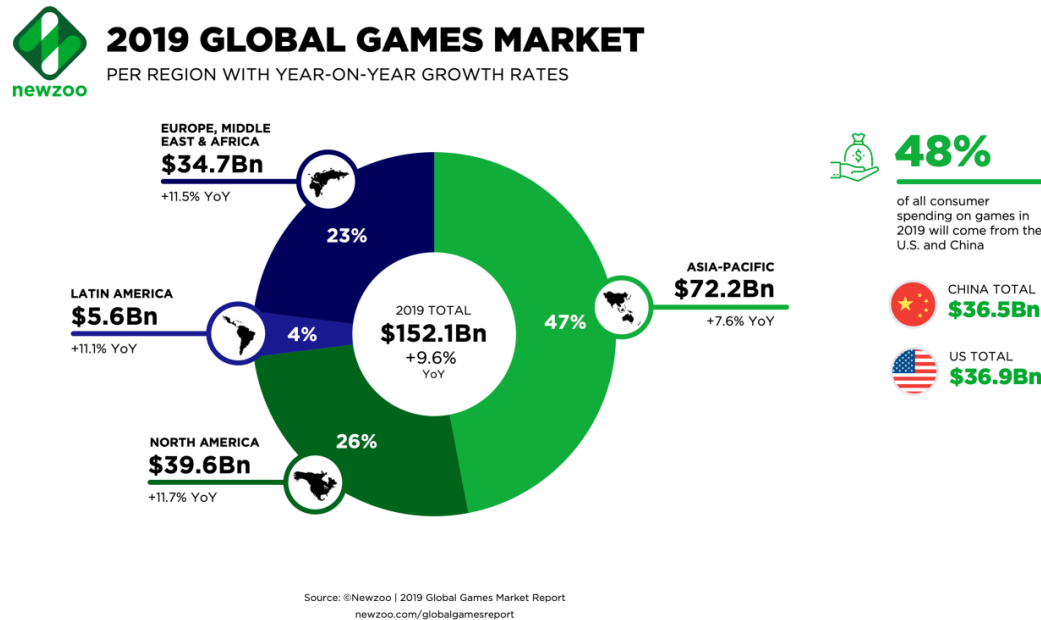
Global Games Market Growth Rates 2019



Source: (Wijman T. 2019, June 18)

If we talk about 2019, the mobile game platform experienced a 6% decrease in share compared to 2018, while a 10.2% increase in revenue is seen when the general situation is considered. On the other hand, it is seen that the 6% lost share went to the console platform. The console game platform has greatly increased its share in the sector with a share of 32% compared to the previous year and has a total annual growth of 13.2%. As for the pc platform, it closed the year with an increase of 4%, reached \$35.7bn revenue and managed to maintain the general denominator situation with a 1% loss, after the big blow from mining. For this reason, the fact that the PC platform did not close a major crisis with negative numbers is a serious example of success (Wijman T. 2019, June 18).

Figure 35

Global Games Market Region Growth Rates 2019

Source: (Wijman T. 2019, June 18)

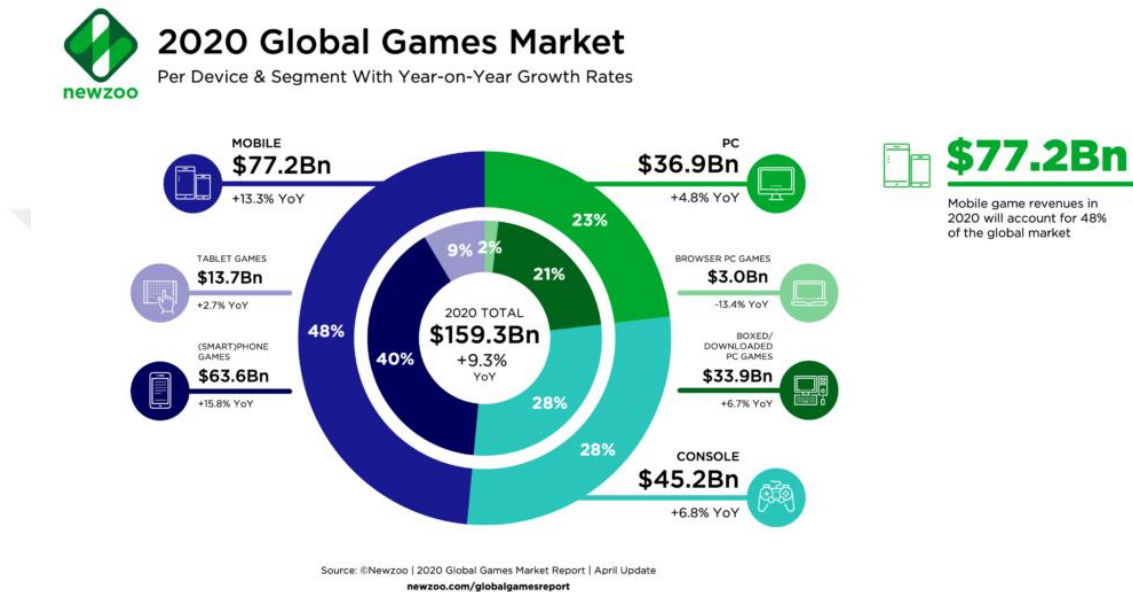
When we review the regional situation in 2019, a decrease is observed on the Asian side. In addition to the effect of the share change, we can observe that the 3% growth in the USA is due to the popularization of console games, which we saw in figure 35. Accordingly, we can easily attribute the loss of the Asian region to the American region and the loss of the mobile game platform in figure 34. to the transition to the console platform because we can easily see that the stagnation of China's biggest rise in the mobile platform in figure 30. and the decrease in the share of Asian players are directly proportional to this situation.

On the other hand, when we look at the European side, we can see that it has grown in proportion to the growth rates of other regions and has maintained its share. When we compare the general total, the sector, which closed with \$152.1bn income level, is very prone to the growth index and we can attribute this tendency to its 9.6% growth (Wijman T. 2019, June 18).

2.5.4. Global Gaming Market Year-to-Year Growth Rates and Interpretations 2020

Figure 36

Global Games Market Growth Rates 2020



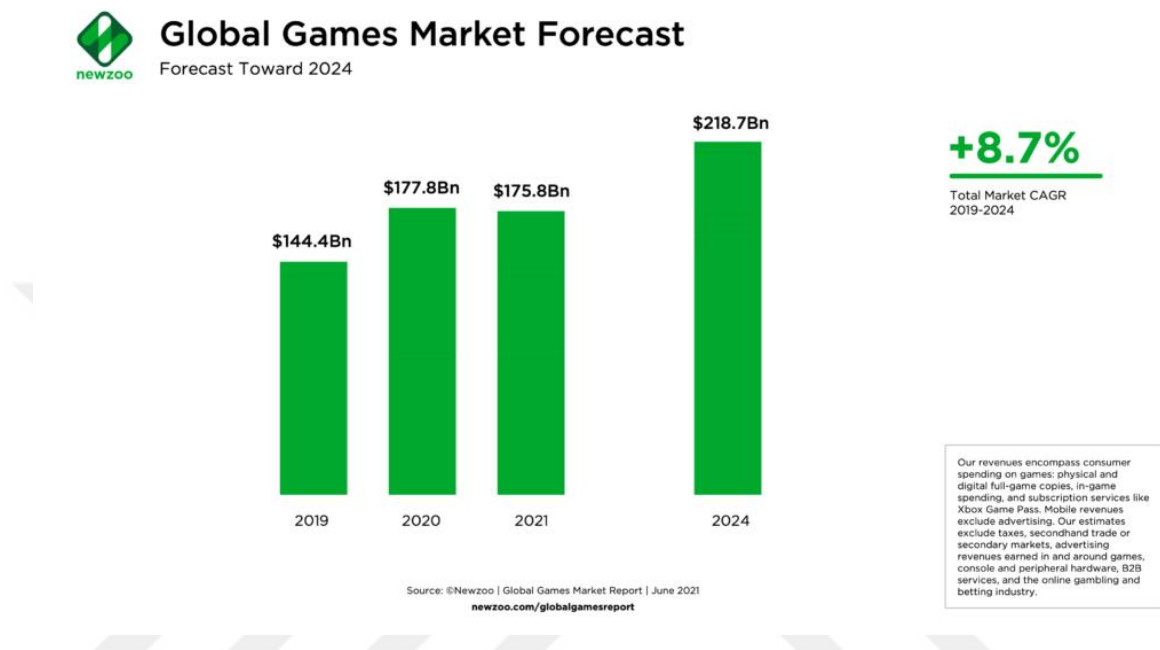
Source: (Wijman T. 2020, May 8)

Coming in 2020, the mobile gaming platform, which lost its share in 2019, showed a great improvement in the growth process and regained a part of the general share it lost. We can show COVID-19 as the biggest effect of this growth. In addition, with this share growth, it has approached the 50% threshold again. As a mobile game platform, it achieved a revenue volume of 77.2bn dollars and showed a growth of 13.3% compared to last year. If we evaluate the PC platform, it has achieved a 4% growth by reaching a revenue level of 36.9bn dollars, despite being greatly affected by the COVID-19 and the chip crisis, as it was last year. As a result, PC platform managed to maintain its percentage in the general share. On the other hand, the console platform was affected by these events and with the slightest effect of the new

generation game consoles, it showed a growth of 6.8% and had a revenue of 45.2bn dollars (Wijman T. 2020, May 8).

Figure 37

Global Games Market Forecast 2019-2024



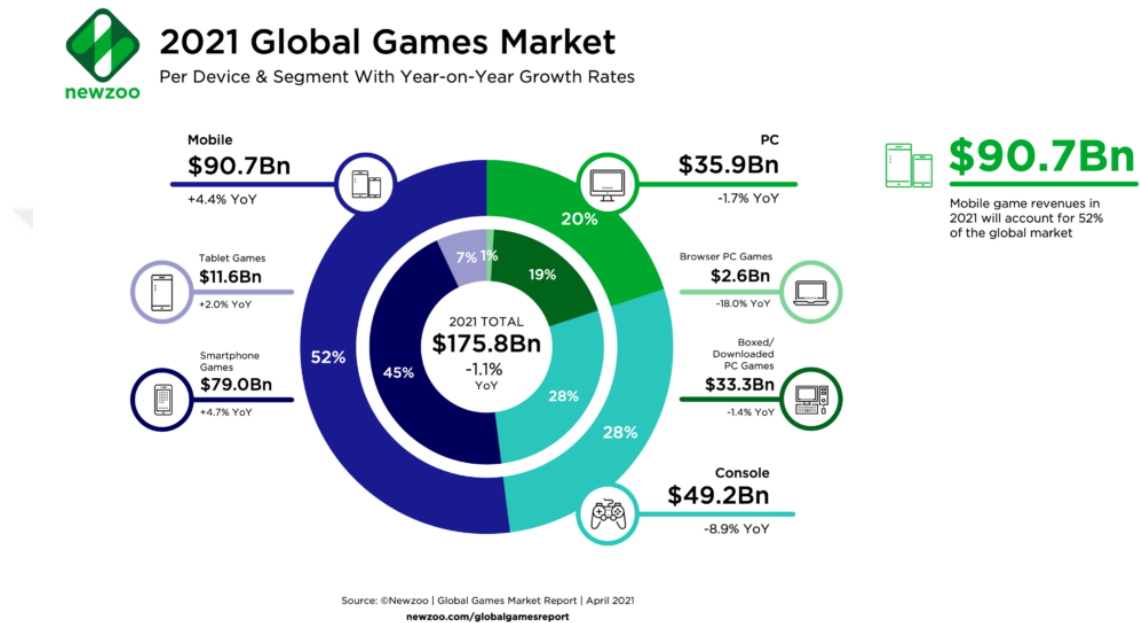
Source: (Wijman T. 2020, May 8)

The gaming platform is a growing industry. Although the game platforms were shaken by events such as COVID-19 and the chip crisis, the game platforms managed to end this situation with a positive result with their innovative devices and actions. The game industry, which showed great growth in the events between 2019 and 2020, was predicted to be shaken in 2021 due to the chip crisis and it was seen that there would be a pause in the growth situation. When we look at this situation from another perspective, it is estimated that in 2024, with the end of the effect of the chip crisis, the gaming industry will show a great rise and reach \$218bn in revenue (Wijman T. 2020, May 8).

2.5.5. Global Gaming Market Year-to-Year Growth Rates and Interpretations 2021

Figure 38

Global Games Market Growth Rates 2021



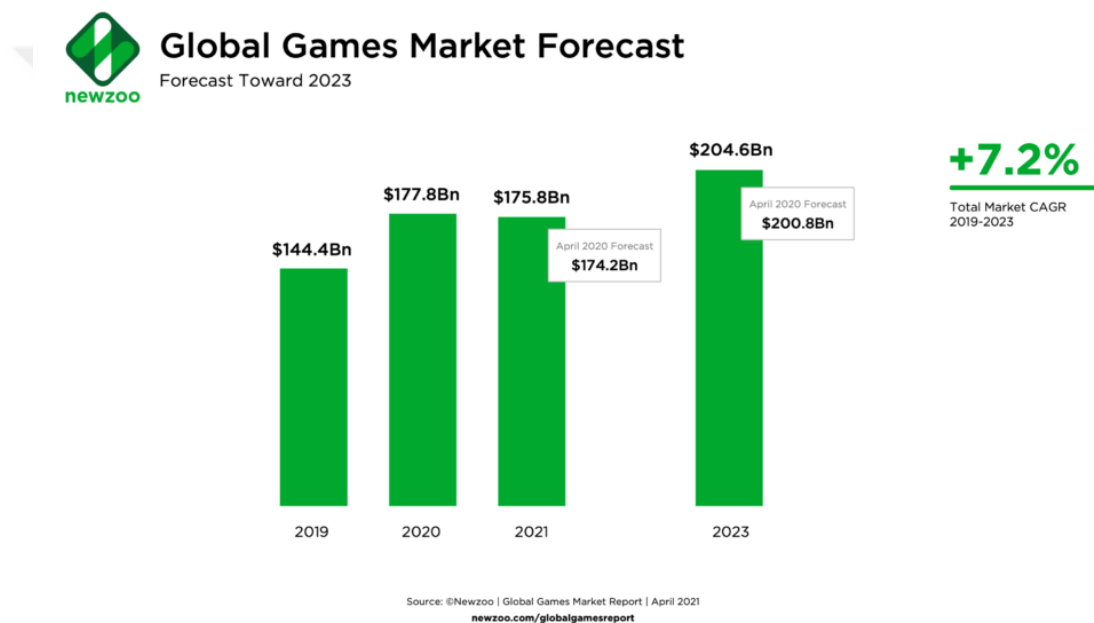
Source: (Wijman T. 2021, May 6)

We can see that the impact of COVID-19 and the chip crisis, which came out towards the end of 2020, provides a great source of income to the mobile game world. With the effect of COVID-19 and chip crisis, the mobile game platform had a share of 52% with a revenue volume of 90.7bn dollars. On the other hand, the PC platform has suffered great declines and due to the shortage of graphics cards, people have not been able to spend enough money on PC games. As a result, the PC platform experienced a 1.7% loss in revenue compared to last year and its value decreased by 35.9bn dollars. If we come to the console platform, although it seems to have a higher income level compared to last year's data, a decrease of 8.9% was observed in the income level in the 4-month period. We can attribute the reason for this decrease to the inability to provide sufficient production by launching the new generation game

consoles. In general, we see the impact of COVID-19 and the chip crisis to a large extent. A revenue of 175.8bn dollars is observed with a decrease of 1.1% compared to the previous year. We can say that the biggest reason behind this decrease is that the events that took place last year made positive income increases at the beginning and the big expectations that came afterwards were not met (Wijman T. 2021, May 6).

Figure 39

Global Games Market Forecast 2019-2023



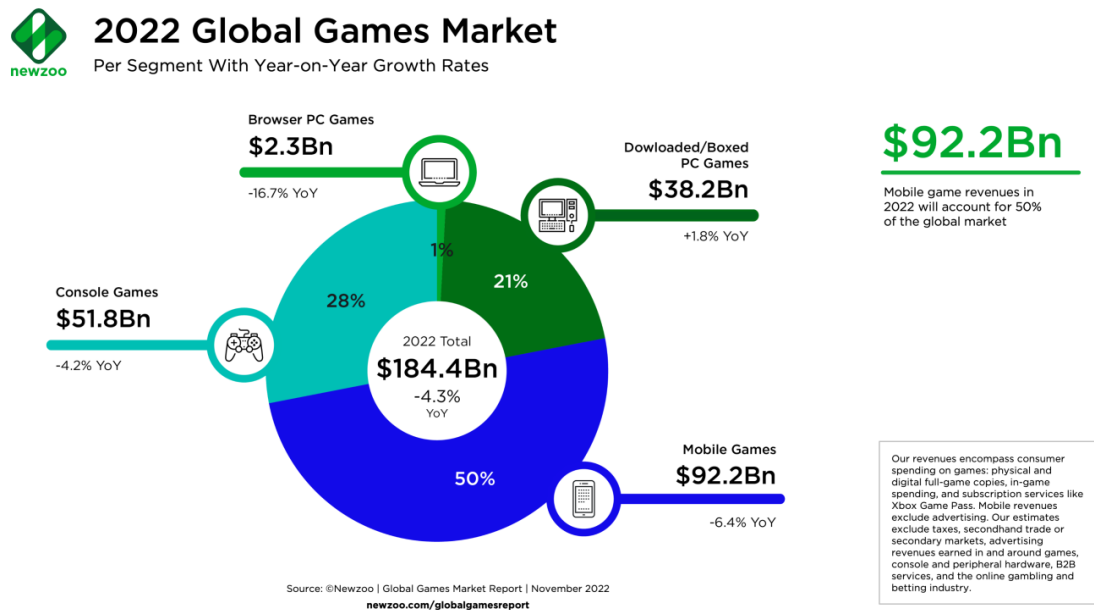
Source: (Wijman T. 2021, May 6)

The gaming platform is a growing industry. Although the game platforms were shaken by events such as COVID-19 and the chip crisis, the game platforms managed to end this situation with a positive result with their innovative devices and actions. The game industry, which showed great growth in the events between 2019 and 2020, was predicted to be shaken in 2021 due to the chip crisis and it was seen that there would be a pause in the growth situation. On the other hand, it is estimated that in 2023, with the end of the effect of the chip crisis, the gaming industry will show a great increase and reach 204.6bn dollars in revenue (Wijman T. 2021, May 6).

2.5.6. Global Gaming Market Year-to-Year Growth Rates and Interpretations 2022

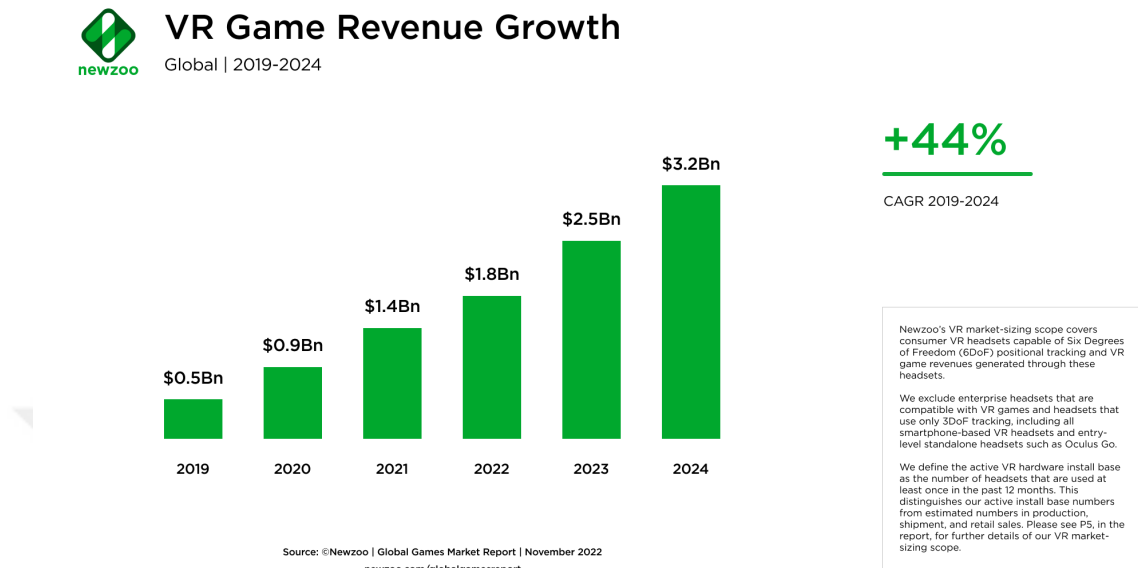
Figure 40

Global Games Market Growth Rates 2022



Source: (Wijman T. 2022 December 21)

When we come to the year 2022, the game industry has risen to the level of 184bn dollars, surpassing the 175bn decrease in the previous year. When we look at the platforms, the mobile game platform experienced a 2% shrinkage in terms of general share, but reached the highest level of income by reaching the level of 92bn dollars in terms of revenue. On the other hand, the console platform maintained its position in the share compared to the previous year, showing a growth of \$51.8bn. On the PC platform, it is observed that after the big problems it experienced from last year, it started to rise again with the effect of the chip crisis gradually decreasing. However, the pc platform showed a growth rate of 1.8% with \$38.2bn in revenue. At the same time, it is seen that a new part of the PC platform is formed as website games at a rate of 2.3% (Wijman T. 2022 December 21)

Figure 41*VR Games Revenue Growth Rates 2019-2024*

Source: (Wijman T. 2022 December 21)

Apart from these platforms we mentioned (Mobile, PC, Console etc.), it is seen that there are serious investments in VR technology, which pioneers platforms such as metaverse. It is thought that the VR technology will come to great places in this sector in the future. The VR platform, which had a low income level of \$0.5bn dollars in 2019, has now tripled itself and has an income of \$1.8bn. In the near future, it expects the VR platform to double its current income level in 2024 and reach an income level of approximately \$3.2bn dollars. It is surprising that this level is at the same level as the web browser sales revenue on the PC platform. (Wijman T. 2022 December 21)

3. EMPIRICAL PART

In this part of the thesis, the research questions will be explained and the questionnaire, the methodology and analysis of the data takes place.

3.1. Research Questions

What will the future of mobile games be like? (Positive / Negative forecast)

Which game platforms do individuals in which age group prefer?

Which gaming platforms do people prefer?

3.2. The Questionnaire

The survey in Appendix A and B aims to examine people's thoughts about mobile games. The first part of the questionnaire consists of the personal information of the participants, including gender, age, etc. demographic data are included. In the middle part of the questionnaire, the participants' job status, marital status, monthly income, etc. information is requested. The last part of the survey covers topics such as which game platform the participants prefer, what kind of games they play, how often they play, and their thoughts on the future of mobile games. As a result of the answers given to the questions, information about the general information and game habits of the participants is obtained. Through the information obtained, it could be observed which game habits particular human species have.

3.3. Methodology and Limitations of The Study

An anonymous survey was conducted in this thesis. The online survey is set in such a way that participants cannot leave questions blank. This study consists of 217 participants due to the time limit. As a result of the answers given by 217 participants, it brought a different perspective to the thesis on the future of mobile games. Survey participants are citizens passing by on the street in daily life, students studying in

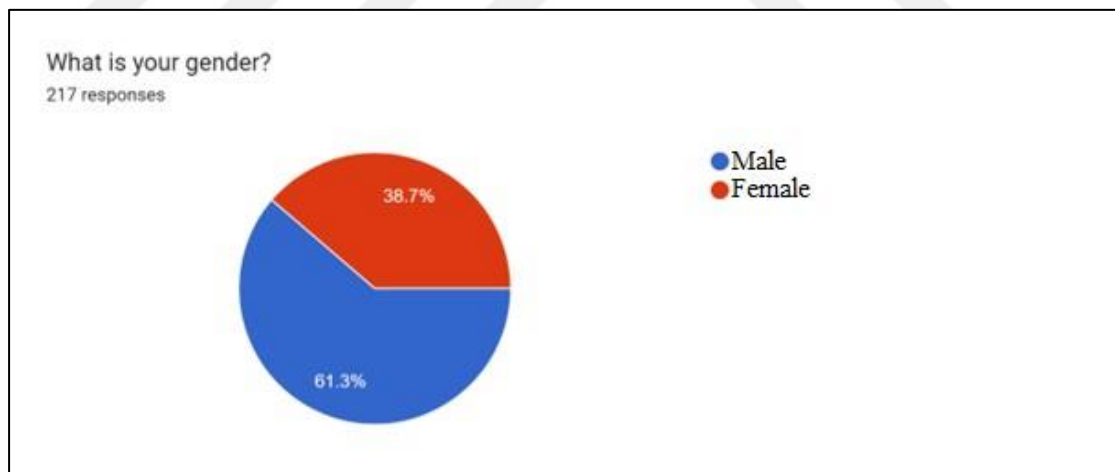
institutions such as universities, high schools and primary schools, players on gaming platforms (Steam, Discord, Reddit etc.) and people working in professional business life. As a result of the data, it will shed light on how people think about gaming platforms, where they prefer to spend time, and how gaming platforms could improve in the future.

3.4. Descriptive Data Analysis

217 respondents participated in the survey and data analysis will be based on descriptive settlement of their responses. The results of the survey are as follows : As can be seen in figure 42. the majority of the participants are 133 (61.3%) marked male and one third of the participants are 84 (38.7%) marked female.

Figure 42

Gender

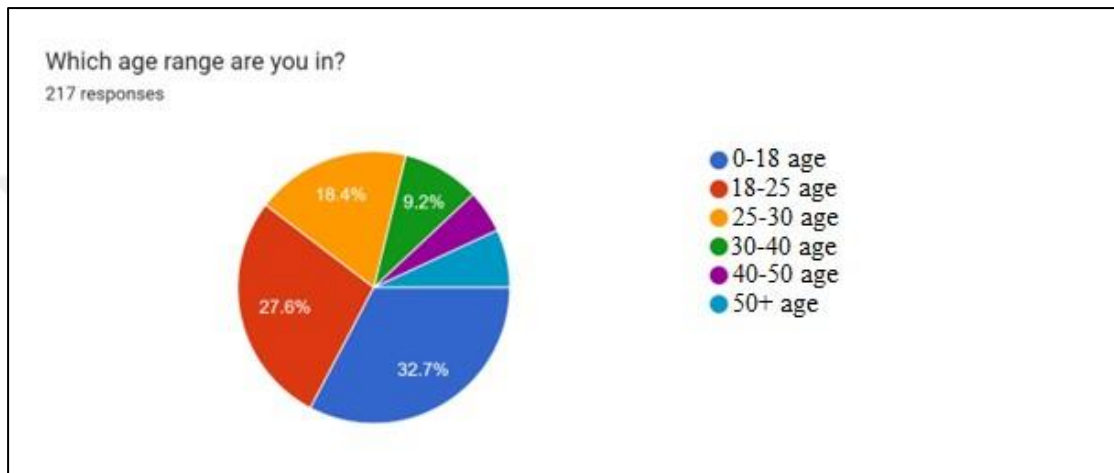


As can be seen from the age graph, it is easily understood that there are quite a lot of young participants. There are 71 participants (32.7%) who marked the 0-18 age group and 60 (27.6%) who marked the 18-25 age group. Looking at figure 43. middle-aged participants also have a considerable share of the whole. There are 40 participants (18.4%) who marked the 25-30 age group and 20 participants (9.2%) who

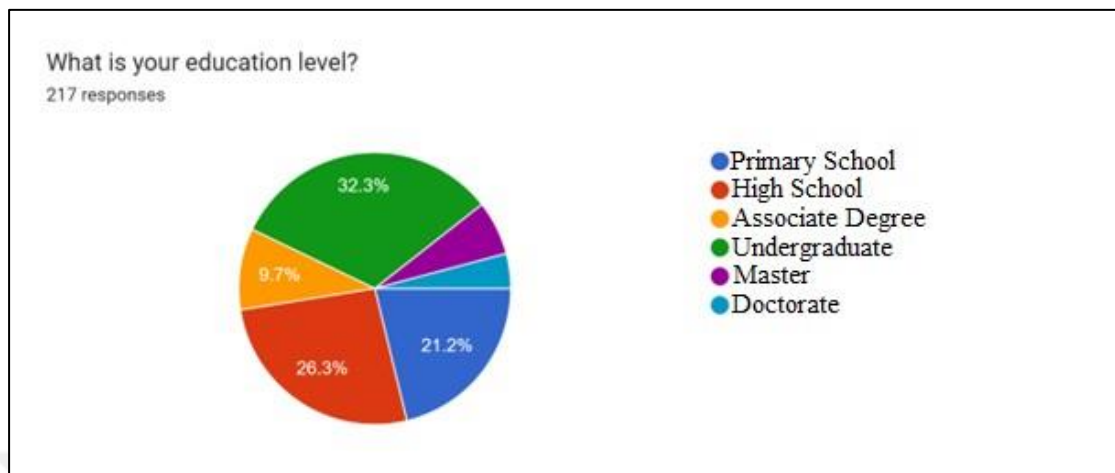
marked the 30-40 age group. The rest belongs to the age 40+ and group that we can define as old. In these segments, there are 11 participants (5.1%) who marked the 40-50 age group and 15 (6.9%) who marked the 50 age group.

Figure 43

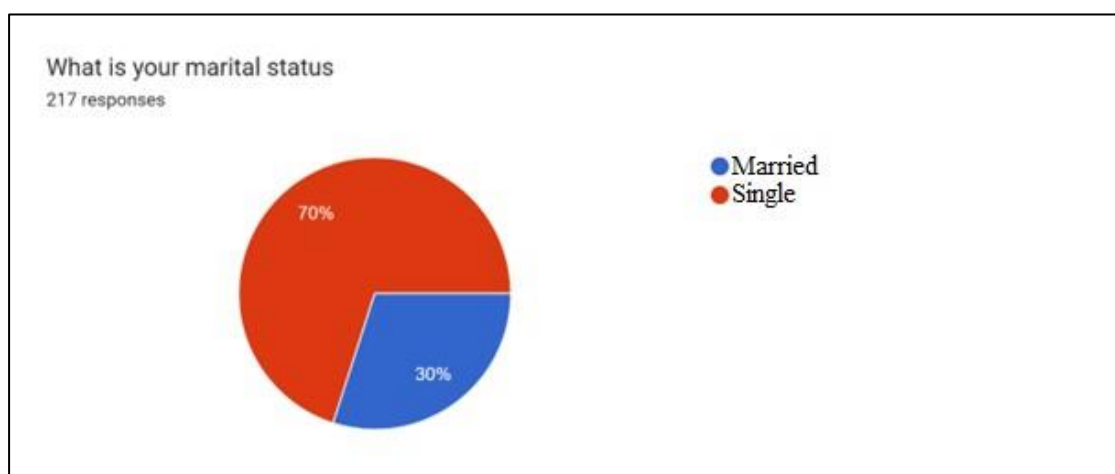
Age



Similar results were observed in the education figure 43. as more than half of the participants in the education status section were young participants. When we look at the figure 44. the number of participants who marked the option of primary school is 46 (21.2%) and the number of participants who marked the option of high school is 57 (26.3%). The majority of mature participants marked the undergraduate option and the number of participants is seen as 70 (32.3%). Additionally, a few number of old people marked primary and high school choices. In the other parts of the figure 44. the number of participants who marked the option of Associate Degree is 21 (9.7%). The number of participants who marked the option of Master's Degree is 14 (6.5%) and the number of participants who marked the option of Doctorate is 9 (4.1%).

Figure 44*Education*

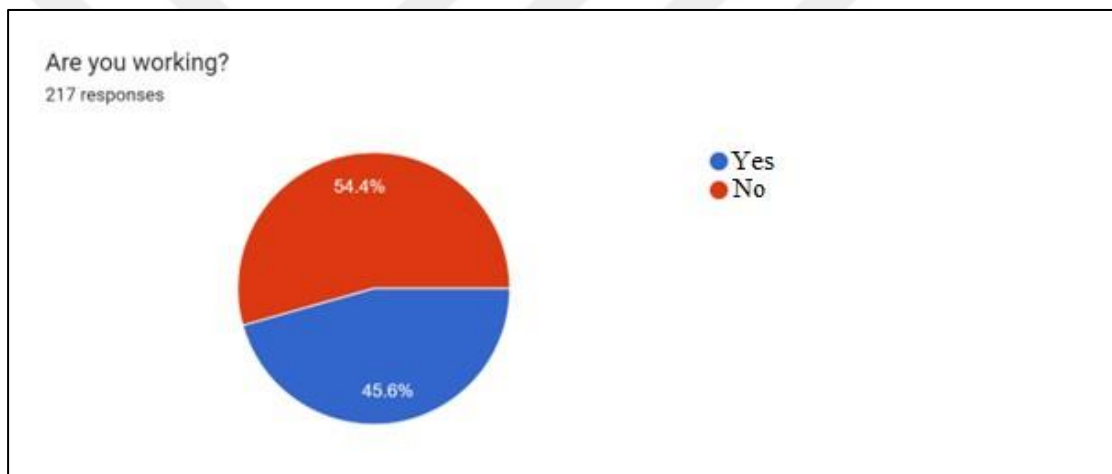
The majority of the participants marked the unmarried option in the marital status question figure 45. This density in the answer unmarried is due to the fact that the majority of the participants in the study are in the age group of 25 and below. There are 152 (70%) participants who marked the unmarried option and 65 (30%) participants who marked the married option in figure 45.

Figure 45*Marital Status*

The percentage of working is low due to the fact that the participants are in the under 25 age group and being a student, as seen in figure 43. and 44. Despite such young participants, the number of active in business life people were higher than expected. According to these results, we can say that students who are both studying and working participated in our research, albeit to a small extent. In figure 46. the number of participants who marked the option "yes" is 118 (54.4%), and the number of participants who marked the option "no" is 99 (45.6%).

Figure 46

Working Status

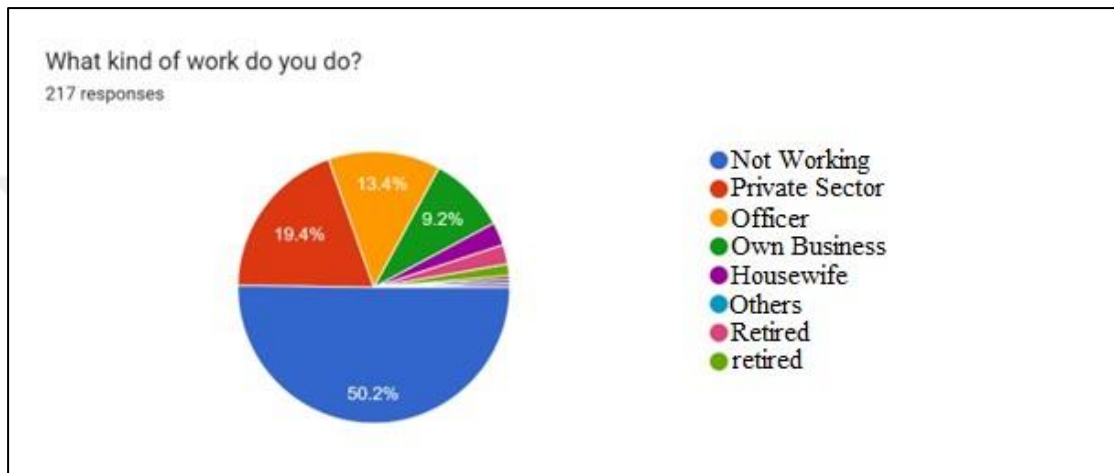


When we look at the working areas of the participants, we can interpret that a little more than half of the participants we see in this figure 47. do not work in any job, due to the high number of young participants we see in figure 43. In addition, we can say that the number of participants who are both students and working in a job is quite high than expected. 109 (50.2%) of the participants marked the option 'not working'. Moreover, the number of participants working in the private sector is 42 (19.4%) and the number of participants who are officers is 29 (13.4%). The number of participants doing their own business is 20 (9.2%). The number of participants who marked the option "housewife" is 6 (2.8%). There are also 3 (1.4%) participants who do their own work but choose their own option from the 'other' option. Apart from this, we have 8 (3.7%) retired participants 3 (1.4%) who form and mark the option

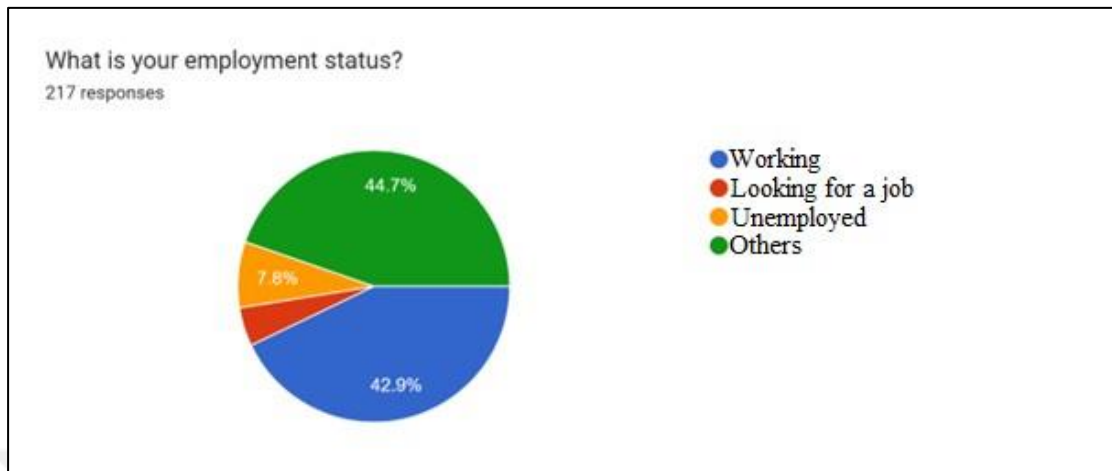
"retired" and 5 (2.3%) who form and mark the option "Retired". Finally, when we look at the participants in general, it can be observed that there are a certain number of participants from all kinds of business areas.

Figure 47

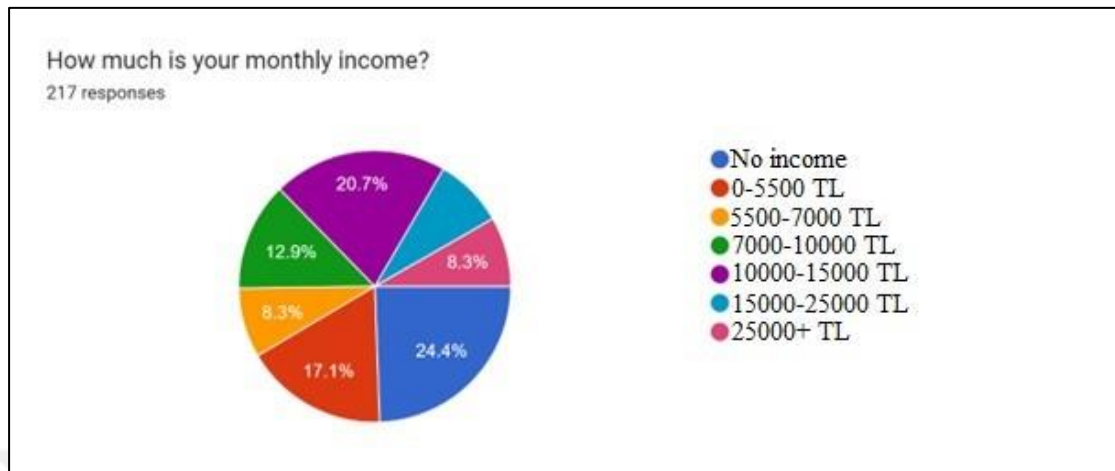
Type of Work



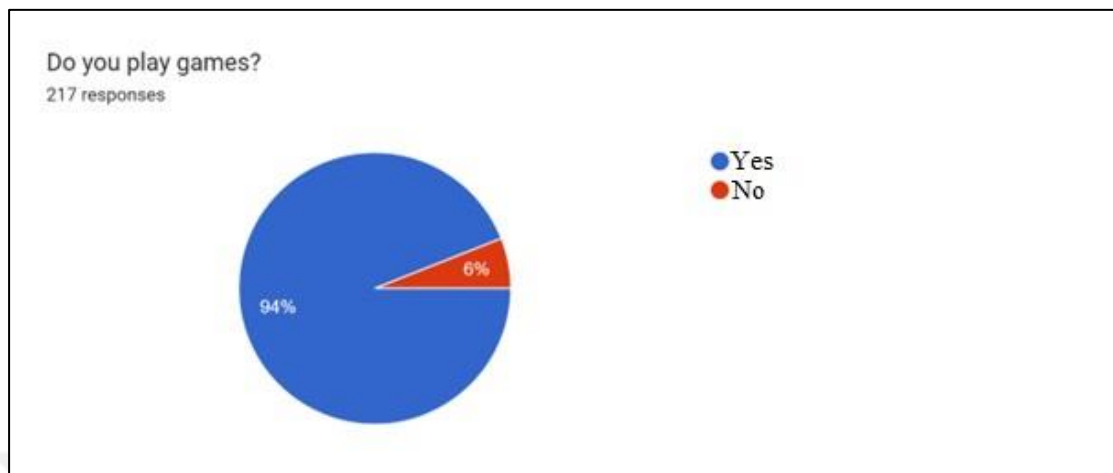
Coming to the Employment Status 48. figure, it reveals how many of the young people are in a job, as we see in the figures 47. 97 of the participants (44.7%) marked the "other" option. In addition, the number of participants who marked the "unemployed" option is 17 (7.8%). As can be seen here, a value close to the unemployment rate of our country has been obtained. the number of job seekers is 10 (4.6%). The slice of people working anywhere has interestingly 93 (42.9%) participants. The fact that there are so many working participants shows that even the elderly population is still working.

Figure 48*Employment Status*

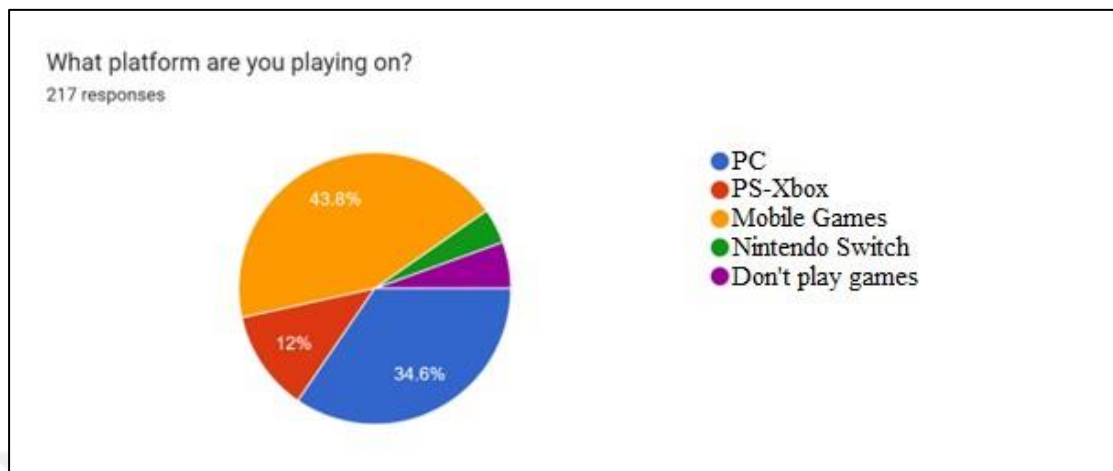
As can be seen in Figure 49, 53 (24.4%) of the respondents chose the "No income" option, the majority of which are young respondents. There are 37 (17.1%) participants in the 0-5500 TL part. When we look at the figure 45. we can see that the majority of the participants marked the option I do not work, I do not have an income and this discrepancy in the options 0-5500 TL brings to mind the thought that the young participants may have written their pocket money as income. There are 18 (8.3%) participants stating that they have an income of 5500-7000 TL. In addition, the number of participants who marked the option 7000-10000 TL is 28 (12.9%) and the number of participants who marked the option 10000-15000 TL is 45 (20.7%). Some income levels have a higher density of participants compared to other income levels, so we can deduce that civil servants and private sector workers in figure 45. mostly have incomes in these ranges. Finally, if we look at other income levels, there are 18 (8.3%) participants for 15000-25000 TL and 18 (8.3%) participants for 25000 TL+.

Figure 49*Revenue*

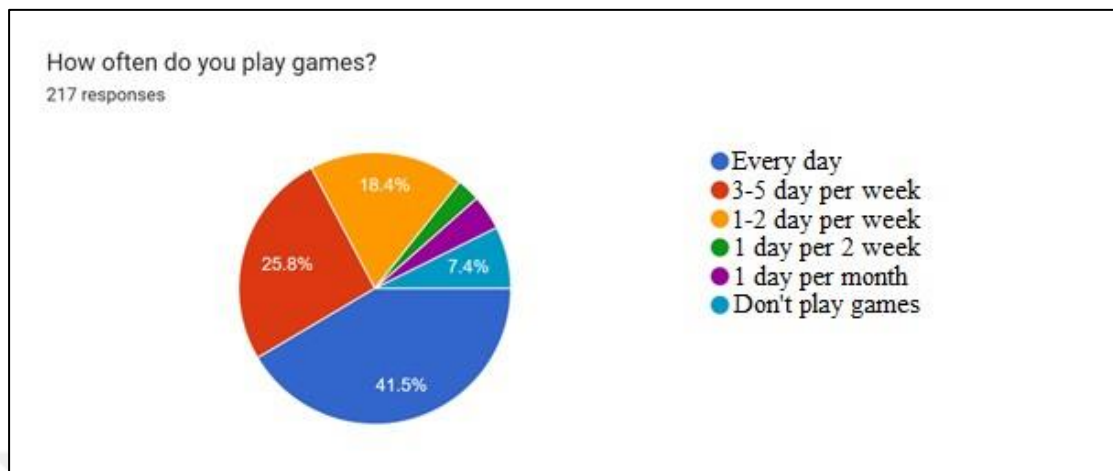
When we evaluate figure 50. we can say that the answers according to certain age groups surprise us in this part, as we can remember from figure 43. Because the result of 50. figure, with the contribution of the participants between the ages of 50+ and 40-50, is quite different from the predicted. A very large part of the participants marked the option "I play games" and a small number of them marked the option "I do not play any games". Among the 217 participants, there are 204 (94%) participants who play games, and only 13 (6%) participants who do not play games. The conclusion that can be drawn from this is that the games appeal to people of all ages and can be played by everyone.

Figure 50*Game Play Status*

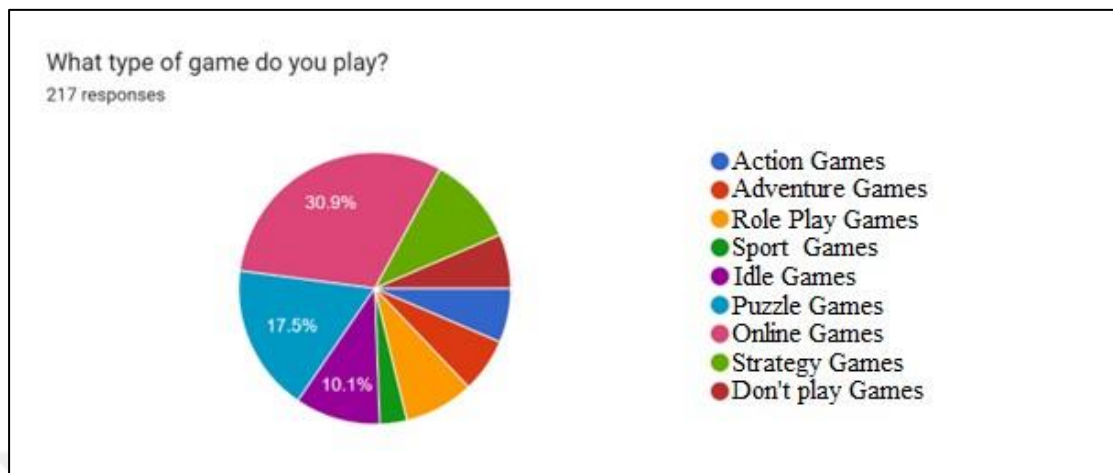
In figure 51, where the participants stated their game platform preferences, it is seen that almost half of the participants prefer mobile games. 95 (43.8%) of the participants marked the mobile game option. On the other hand, nearly one-third of the participants marked PC option. There are 75 (34.6%) participants who marked the PC option. In the survey, even the PC, which is considered the most preferred platform for gaming, ranked 2nd next to mobile gaming. When we look at PS-Xbox, there are 26 (12%) participants and 9 (4.1%) participants in Nintendo Switch. As can be seen from figure 50, participants who do not play games (except 1 participant) clearly showed themselves here. The number of markings "I don't play games" is 12 (5.5%).

Figure 51*Game Platforms*

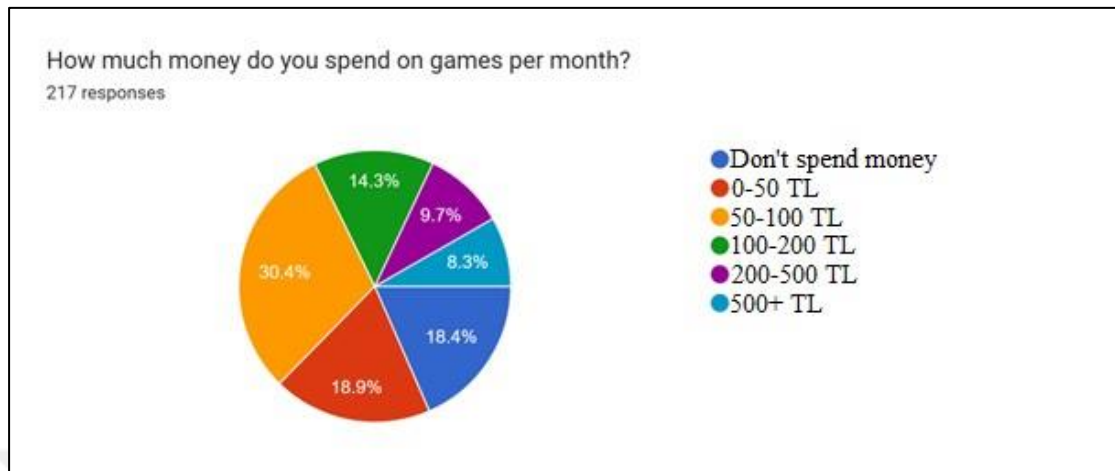
When we examine the part where we ask the participants how often they play games figure 52. it is possible to say that the participants prefer to access the games easily from anywhere because they prefer the mobile game platform as we see in figure 51. The number of participants who marked the option "every day" is 90 (41.5%), who marked the option "3-5 days a week" is 56 (25.8%), who marked the option "1-2 days a week" is 40 (18.4%), who marked the option "every 2 weeks" is 6 (2.8%), who marked the option "once a month" is 9 (4.1%) and who marked the option "I don't play games" is 16 (7.4%).

Figure 52*Game Play Time*

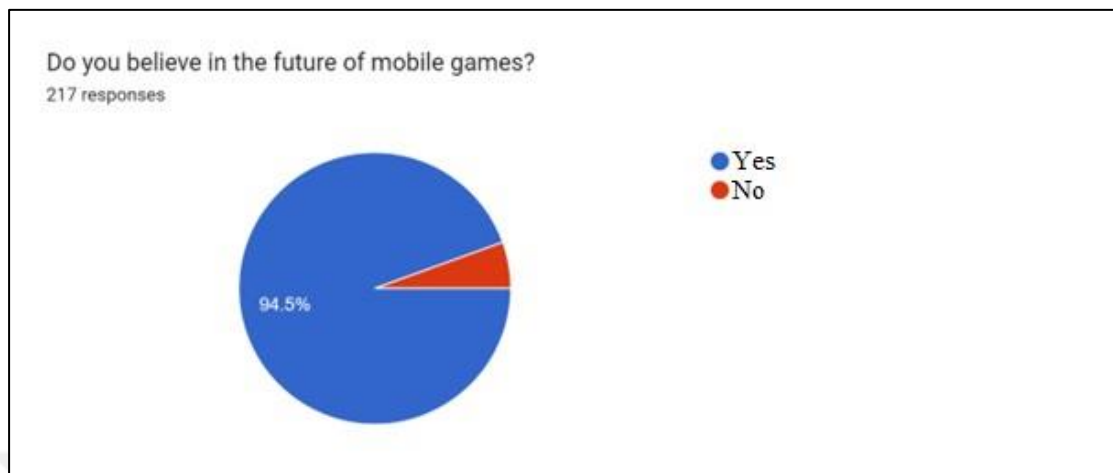
As we can see in at the part where we ask about the types of games played by the participants figure 53. it is observed that 8 different game types are preferred separately. There are also those who do not play games based on this. The number of participants who marked the option of "online games" is 67 (30.9%), who marked the option "puzzle games" is 38 (17.5%), who marked the option "idle games" is 22 (10.1%), who marked the option of "sports games" is 7 (3.2%), who marked the option "role-playing games" is 18 (8.3%), who marked the option of "adventure games" is 14 (6.5%), who marked the option of "action games" is 14 (6.5%) and who marked the option "I don't play games" is 14 (6.5%).

Figure 53*Type of Games*

As can be seen from figures 43. and 49. the majority of the participants consist of young people who do not have a certain income level. However, most of the participants spend money on games. The dispersion is as follows, the number of participants who spend between 0-50 TL on the games every month is 41 (18.9%), who spend between 50-100 TL on the games every month is 66 (30.4%), who spend between 100-200 TL on the games every month is 31 (14.3%), who spend between 200-500 TL on the games every month is 21 (9.7%), who spend 500+ TL on the games every month is 18 (8.3%) and who marked the option "I don't spend money on games" is 40 (18.4%).

Figure 54*Money Spend on Games*

Lastly, we asked the participants what they thought about the future of mobile games. When we examine the answers, we can say that the participants think that mobile games will develop like other platforms and that they have a very positive view of the future of mobile games. While 205 (%94.5%) people think that mobile games will develop, only 12 (5.5%) people think that mobile games will not develop. If we make a comment on the result, even some participants who marked "no" in graphic that we saw in figure 50. think that mobile games will improve at the future.

Figure 55*Future of Mobile Game***3.5. The Questionnaire Result**

When we evaluate the answers of the participants in the 14-question survey, we reach people's interest in the mobile platform. As a result of some living standards such as age, income level and business life, we can say the platform which people prefer and enjoy the most among gaming platforms is mobile platform. The mobile platform is the choice of people, regardless of age, with its more convenient accessibility than other platforms and its free service to millions of applications with all kinds of smart phones.

The participants mainly consist of young male population, have secondary school-undergraduate level education and are single. In the working rates of this youth-dominated participant group, yes and no choices have an almost equal distribution. Since a large part of our participant group, where almost everyone plays games, consists of young individuals, we learned that they play every day and invest a small amount of money between 0-50 and 50-100 TL per month to the games.

When we examine the answers, we can say that the participants think that mobile games will develop like other platforms and they have a very positive perspective on the future of mobile games. In short, If the mobile platform continues

to develop in this way, it seems possible to say that other game platforms will not be able to catch up with the mobile game platform in the near future.



4. CONCLUSION

I had to do a lot of research for the thesis so that I could have a general idea about the development of all platforms and the paths they took during this development stages. As a result of these researches, I had the opportunity to learn that the PC platform is much older than the other two, that the console platform has a long and competitive past and that the latest among these three platforms is the mobile platform. Without doing much research, we could conclude that the PC platform is currently the most successful and most growing platform due to the fact that it is the oldest but as a result of research, we saw that the newest of the three platforms we mentioned was the mobile platform with the most growth and success. In addition, we can say that both PC and mobile platforms were not produced for games in its early days but although the mobile platform came out later than the PC platform, it adapted to the gaming industry more quickly.

The gaming industry is a growing industry today. In the comparison of the three platforms, namely mobile, PC and console platforms, especially the rapidly developing mobile platform, we see in the data obtained as a result of the research that we focused on the crypto currency mining problem, COVID-19 and the chip crisis. When we considering these three factors , mobile platform has gained the title of the platform with the highest income and with a market share of over 50%. It is also clear that this title cannot be taken away from the mobile platform in the near future.

After comparing the game industry platforms, especially the mobile game platform, and analyzing the data, which I made on the graphics created with the data between 2017-2023, we encountered some inferences and results. With the crypto currency mining problem that emerged at the end of 2017 and the beginning of 2018, we were able to see big drops across PC and console platforms. Lastly, the mobile platform closed the gap caused by the drops professionally. In addition, we noticed that while the COVID-19 problem continued, every platform showed a positive rise and this sudden rise caused a problem such as a chip crisis. While researching the chip crisis, we realized that the mobile platform has turned into the largest gaming platform from the beginning of the chip crisis to the present, followed by console and PC platforms.

Apart from these platforms (Mobile, PC, Console etc.), we had the opportunity to learn that serious investments were made in VR technology, which pioneered platforms such as Metaverse. When we examine the data, we associate it with the fact that VR technology will be among the three main platforms in the future and that it has the opportunity to compete with the mobile platform, which we can call the best among them.

When we talk about my survey in the last part of my research, as a result of the general answers given to our research questions we made, we have reached the data with which we can compare the market share of mobile game with 217 participants and its popularity compared to other game platforms. With these data, we have observed that people are very keen on the mobile gaming platform, that mobile is more preferred among other platforms, that the number of people investing money in games is higher in general and that it may stand in a larger position compared to other gaming platforms in the near future.

By making use of this thesis, research can be made on game platforms, and other graphics that will be formed in the coming years can be interpreted comparatively according to the income graph analysis mentioned in the thesis. In addition, through the survey study conducted with 217 participants, further research can be strengthened, or the data obtained with future surveys can be compared. To add, the predictions made in this thesis can be refuted or confirmed by other studies on this subject.

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APPENDIX A:

Personnel Information:

- 1) Cinsiyetiniz nedir?
 - a) Erkek
 - b) Kadın
- 2) Kaç yaşındasınız?
 - a) 0-18 yaş
 - b) 18-25 yaş
 - c) 25-30 yaş
 - d) 30-40 yaş
 - e) 40-50 yaş
 - f) 50+ yaş
- 3) Eğitim durumunuz nedir?
 - a) İlk ve Orta Öğretim
 - b) Lise
 - c) Önlisans
 - d) Lisans
 - e) Yüksek Lisans
 - f) Doktora
- 4) Medeni durumunuz?
 - a) Evli
 - b) Bekar
- 5) Bir yerde çalışıyor musunuz?
 - a) Evet
 - b) Hayır
- 6) Ne tür bir işte çalışıyorsunuz?
 - a) Çalışmıyorum
 - b) Özel Sektör
 - c) Memur
 - d) Kendi işinde
 - e) Ev hanımı
 - f) Diğerleri
- 7) Çalışma durumunuz?

- a) Çalışıyor
 - b) İş arıyor
 - c) İşsiz
 - d) Diğerleri
- 8) Geliriniz ne kadar?
- a) Gelirim yok
 - b) 0-5500 TL
 - c) 5500-7000 TL
 - d) 7000-10000 TL
 - e) 10000-15000 TL
 - f) 15000-20000 TL
 - g) 20000-25000 TL
 - h) 25000+ TL
- 9) Oyun oynuyor musunuz?
- a) Evet
 - b) Hayır
- 10) Oyun oynarken en çok hangi platformları tercih ediyorsunuz?
- a) PC (Bilgisayar oyunları)
 - b) PS-Xbox (Konsol oyunları)
 - c) Mobil oyunlar (Telefon oyunları)
 - d) Nintendo Switch (Taşınabilir konsollar)
 - e) Oynamıyorum
- 11) Ne sıklıkla oyun oynuyorsunuz?
- a) Her gün
 - b) Haftada 3-5 gün
 - c) Haftada 1-2 gün
 - d) 2 Haftada 1 gün
 - e) Ayda 1 gün
 - f) Oynamıyorum
- 12) En çok hangi tür mobil oyun oynuyorsunuz?
- a) Aksiyon Oyunları
 - b) Macera Oyunları
 - c) Rol Yapma Oyunları
 - d) Spor Oyunları
 - e) Idle Oyunları

f) Bulmaca Oyunları

g) Online Oyunlar

h) Strateji Oyunları

i) Oynamıyorum

13) Oyunlara aylık ne kadar para harcıyorsunuz?

a) Harcamıyorum

b) 0-50 TL

c) 50-100 TL

d) 100-200 TL

e) 200-500 TL

f) 500+ TL

14) Mobil oyunların diğer oyun platformları gibi gelişeceğini düşünüyor musunuz?

a) Evet

b) Hayır

APPENDIX B:

Personnel Information:

- 1) What is your gender?
 - a)Male
 - b)Female
- 2) Which age range are you in?
 - a)0-18 age
 - b)18-25 age
 - c)25-30 age
 - d)30-40 age
 - e)40-50 age
 - f)50+ age
- 3) What is your education level?
 - a)Primary School
 - b)High School
 - c)Associate Degree
 - d)Undergraduate
 - e)Master
 - f)Doctorate
- 4) What is your marital status?
 - a)Married
 - b)Single
- 5) Are you working?
 - a)Yes
 - b)No
- 6) What kind of work do you do?
 - a)Not Working
 - b)Private Sector
 - b)Officer
 - c)Own Business
 - d)Housewife
 - e)Others
- 7) What is your employment status?
 - a)Working

- b) Looking for a job
 - c) Unemployed
 - d) Others
- 8) How much is your monthly income?
- a) No income
 - b) 0-5500 TL
 - c) 5500-7000 TL
 - d) 7000-10000 TL
 - e) 10000-15000 TL
 - f) 15000-20000 TL
 - g) 20000-25000 TL
 - h) 25000+ TL
- 9) Do you play games?
- a) Yes
 - b) No
- 10) What platform are you playing on?
- a) PC
 - b) PS-Xbox
 - c) Mobil games
 - d) Nintendo Switch
 - e) Don't play games
- 11) How often do you play games?
- a) Every day
 - b) 3-5 day per week
 - c) 1-2 day per week
 - d) 1 day per 2 week
 - e) 1 day per month
 - f) Don't play games
- 12) What type of game do you play?
- a) Action games
 - b) Adventure games
 - c) Role play games
 - d) Sport games
 - e) Idle games
 - f) Puzzle games

- g)Online games
- h)Strategy games
- i)Don't play games

13) How much money do you spend on games per month?

- a)I don't spend money on games
- b)0-50 TL
- c)50-100 TL
- d)100-200 TL
- e)200-500 TL
- f) 500+ TL

14) Do you believe in the future of mobile games?

- a)Yes
- b)No