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Electronic Gamble Industry Under the Pandemic: Impact on Business Activities And Customer Behavior in Chinese Market

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Master in, Management

Supervisor:
Associated Professor, Professor Álvaro Augusto da Rosa, Department of Marketing, Operations and General Management, ISCTE Business School

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BUSINESS
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The process of working on this dissertation was an interesting challenge and came out with great benefits for my academic path. I would like to express my deepest gratitude to who supported and inspired me during the process.

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Ultimately, thanks to my family and friends for always support and encourage me throughout my academic journey.

Abstract

The COVID-19 pandemic started to spread globally rapidly from the end of 2019, and the continuous variation of the virus led many negative problems to the public health as well as the economic environment, became one of the most serious crises in human history. Diverse restriction strategies were issued by governments with the aim to overcome the spread of COVID-19, including social control and business activities restrictions, which effectively reduced the infected cases, but meanwhile, brought the second layer of influences on the economic.

This study is focus on figuring out the influences raised by the COVID-19 pandemic in the gaming industry from the end of 2019, which is to investigate the changes in business activities and economic performances of the gaming companies as well as the behaviors of the gaming markets' customers. The collecting of primary data follows a descriptive method, and the further analysis is based on the pervious studies of the gaming industry.

The result of this dissertation showed that though some disruptions occurred in the business operations, overall, the gaming industry obtained an increasing trend in the revenue performances and positive developments during the pandemic, whether the console, personal computer or mobile gaming segments. Moreover, the study also found that the pandemic related influences on the customer behaviors brought mutually beneficial on both the customer and the gaming companies.

Key word: Game Industry; Covid-19; Pandemic Influences; Customer Behaviors.

JEL Classifications: General (M20); Business Economics (M2).

Resumo

A pandemia de COVID-19 começou a se espalhar globalmente rapidamente a partir do final de 2019, e a variação contínua do vírus levou muitos problemas negativos à saúde pública, bem como ao ambiente econômico, tornando-se uma das crises mais graves da história da humanidade. Diversas estratégias de restrição foram emitidas pelos governos com o objetivo de superar a disseminação do COVID-19, incluindo controle social e restrições às atividades empresariais, o que efetivamente reduziu os casos infectados, mas, por sua vez, trouxe a segunda camada de influências na economia.

Este estudo tem como foco descobrir as influências levantadas pela pandemia de COVID-19 na indústria de jogos a partir do final de 2019, que é investigar as mudanças nas atividades comerciais e desempenhos econômicos das empresas de jogos, bem como os comportamentos dos jogadores. clientes dos mercados. A coleta de dados primários segue um método descritivo, e a análise posterior é baseada em estudos anteriores da indústria de jogos.

O resultado desta dissertação mostrou que apesar de terem ocorrido algumas interrupções nas operações comerciais, globalmente, a indústria do jogo obteve uma tendência crescente nos desempenhos das receitas e evoluções positivas durante a pandemia, quer nos segmentos de consolas, computadores pessoais ou jogos móveis. Além disso, o estudo também descobriu que as influências relacionadas à pandemia no comportamento do cliente trouxeram benefícios mútuos tanto para o cliente quanto para as empresas de jogos.

Palavras-chave: Indústria do Jogo; COVID-19; Influências Pandêmicas; Comportamento do Consumidor.

Classificações JEL: Geral (M20); Economia Empresarial (M2).

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Chapter 1: Introduction

1.1. Relevance of the Research

The dissertation is focus on discussing the impact of COVID-19 pandemic on gaming industry, which more specifically are studying the activities and performances of the console, personal computer and mobile gaming markets and their customer behaviors from the end of 2019. These three main markets might suffer or benefit from the pandemic on a different level due to each specific characteristics, therefore it's necessary to identify their common and diverse performances so as to give out more concrete findings. On the other hand, it's worth to note that the rise of the cloud gaming might has a powerful fluctuation on the traditional gaming industry. The related potential evolution and revolution might bring attracted extensive attention of both marketers and customers, which made it an important part to be acknowledged in this research.

Following the increasing quality of modern life, playing video games has become one of the popular entertainment activities for contemporary people. The market size and customer range of the gaming industry have a constantly expanding, showed great development and prosperity. While at the end of 2019, the COVID-19 pandemic began to spread globally, brought unprecedented impact on the world, from economic environment to people's daily life, especially after many related restriction policy being introduced. While the gaming industry is in a special position, its performances in the pervious three years did not seem to have much negative effects, on the contrary of most of other industries, which made it valuable to have some researches on.

Many local governments began to restrict the population's activities in September of 2020, including closing borders between countries, even cities, having limitation on opening time of shops and restaurants, closing of crowded places. Therefore, people had limit place to go and was suggested to stay at home most of the time (BMC Infectious Diseases, 2021). By studying the people's experiences, identify the reasons and factors that led to behaviors changes as well as the corespondent results brought to the gaming industry.

1.2. Research Questions

With the massive economic fluctuation in the pervious years, the research question of this dissertation is defined as follow: investigating how the COVID-19 pandemic influenced the business activities of the gaming industry? If the customer of the gaming industry behave different during the pandemic and how?

1.3. Research Aim and Objectives

The aim of this study is to identify the influence factors that have impact on the business of the gaming industry during the COVID-19 pandemic. In order to achieve the research aim and figure out the research questions, research objectives are defined as follow: to investigate how the three main gaming markets performed and their consumers behaved in the pervious years, compare the differences between the performances of the gaming industry before and during the pandemic, as well as how the pandemic influenced the business operations of the gaming industry. Since the gaming industry has multiple subsegments, and they might have diverse effects due to different market features. Therefore, this dissertation will carry out specific researches on console gaming, personal computer gaming and mobile gaming markets, so as to figure out their different and common COVID-19-related influences. In regard to the researches on the customer behaviors, it's necessary to investigate whether the time people spent on playing games had a significant change or not, also the changes in the number of active players, game related purchasing behavior, personal preference of game platforms, etc.

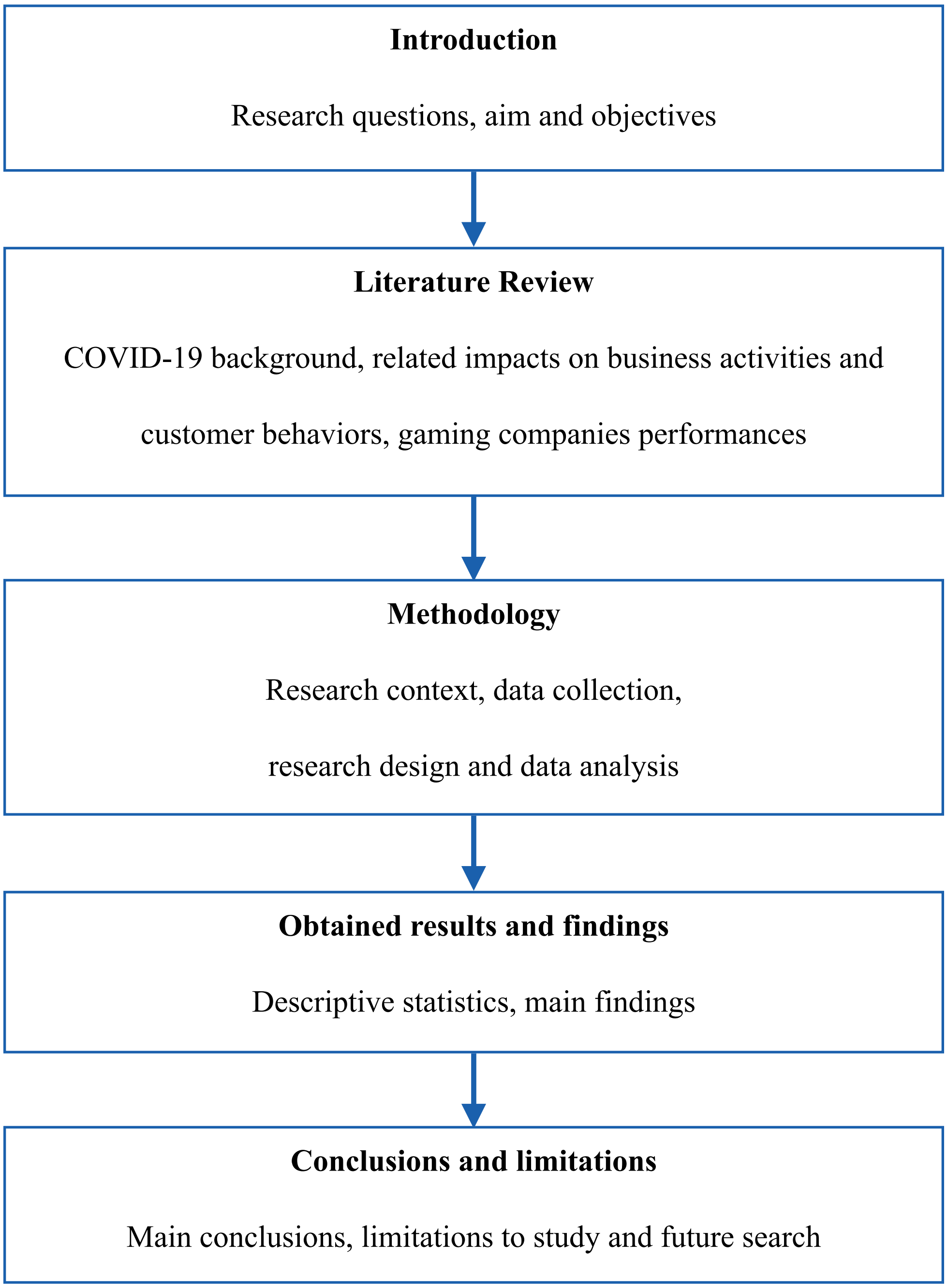

Figure 1: *Structure of the Thesis*

Chapter 2: Literature Review

This dissertation conducted literatures which are focus on the following topics: gaming industry performance and customers behaviors under the COVID-19 background, influences to the console, personal computer and mobile gaming markets and the entrance of cloud gaming.

2.1. COVID-19 Background

The COVID-19 pandemic has become one of the most serious crises in the human history, which is an emerging virus spread rapidly and has continuous variation all over the world. The explosion of the pandemic has raised series of economic, social and politic issues, the uncertainty of the virus has great negative impacts on public health and worldwide economy condition.

According to the World Health Organization, up until November 2022, more than 626 million people have been confirmed positive of COVID-19 and more than 6 million deaths (WHO, 2022). In order to control and manage the emergency crises, diverse lockdown strategies are adopted by different countries, such as closing the countries borders, restriction on social facilities' opening time and disallowed of social gathering, etc (Bin, 2021). Although the inflective situation has subsided, a trade-off raised between the social restriction and economic development. Since most of the public activities were limited, factories and workplaces were not opened as long as before, many new problems were raised by the restriction politics, brought a second layer of influences to people's life and economic environment. For example, many supply chains and producing process were disrupted, led to a decrease in productivity, which resulted into increasing costs in business operations. On the other hand, the rate of absence of workers has increased due to being isolated, which made the situation even worse (Tisdell, 2020).

2.1.1. Impacts on Overall Gaming Industry

The pandemic has no doubt brought unprecedented financial problems to the business. While not all the sectors suffered the same, the gaming industry suffered relatively less during the start of the outbreak, and even had positive financial performances and extended customer base (Cabarcos, Soriano & Chousa, 2020). The digital gaming industry kept growing fast and maintained the position of leading entertainment sector under the pandemic situation, in the meantime the development of automotive, energy and cinema sectors were limited by the restriction politics (Jang & Alkhateeb, 2021).

In addition, the main products and services the gaming companies provided are usually in digital form, the disruption in supply chain did not affect much the overall business activities, on the contrary of the catering and apparel industry. 2020 was a record-breaking sales year for the gaming industry, the revenue from game related purchasing grew by more than 20%, due to many new gamer entered the market (Wijman, 2021). There's a significant increase in the number of register accounts and daily active players in many gaming companies, such as Capcom, Activision-Blizzard, Roblox, Steam platform and Tencent, have drew new heights of concurrent users, benefited much the related companies' stock price and the gaming industry's economic growth (Sener & Yalcin, 2021).

However, many gaming companies also struggled in the operating issues. One third of game developers experienced problems of production delays, including slowdown in innovation and design development, resulted in game release dates delays and products shipment delays, costing companies $1 million per day in some cases. Collaboration is extremely necessary in the gaming development process, however, the developers worked in their home offices individually due to the lockdown, resulted in increasing failures of projects (Waber & Munyikwa, 2021).

Many studies found that the continuous spread of the virus also brought significant impacts on the exchange rate (Putnam, 2020). Countries which had an increasing number of daily cases of COVID-19, usually had their currencies weaken when compare to the countries which had less cases (Figure 2). The fluctuation on exchange rate had great influences on the financial performances of international gaming companies, mainly presented in the sales and revenues, in both positive and negative aspect (Table 1).

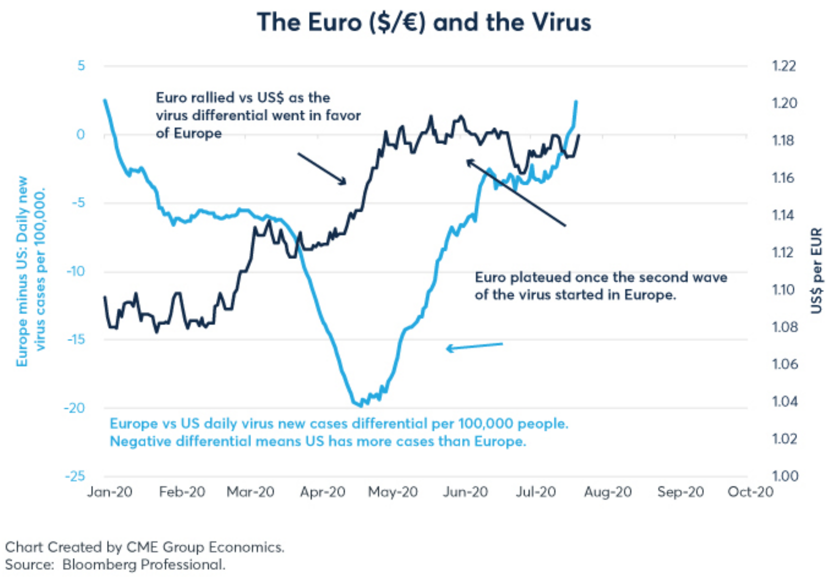

Figure 2: *COVID-19 and Exchange Rate*

Source: CME Group Economics, Bloomberg Professional

The Average Rate of Yen	2019	2020	2021
1 U.S. Dollar	JP¥110.9	JP¥108.7	JP¥106.1
1 Euro	JP¥128.5	JP¥120.8	JP¥123.7

Table 1: *Average Foreign Exchange Rate of Dollar, Euro and Yen*

Source: Sony group corporation 2020 - 2021

A few game platforms showed an accelerating growth in the previous years. Roblox is one of the popular online game platforms which available both on console and computer devices and experienced a typical performance in the gaming industry. An increase trend in the number of daily active users of Roblox was showed clearly in Figure 3, especially after the forth quarter of 2019, when was the time the COVID-19 started to spread. Compared with the period before 2019 Q4, the number of daily active users in 2022 Q2 has increased more than 150% (Clement, 2022).

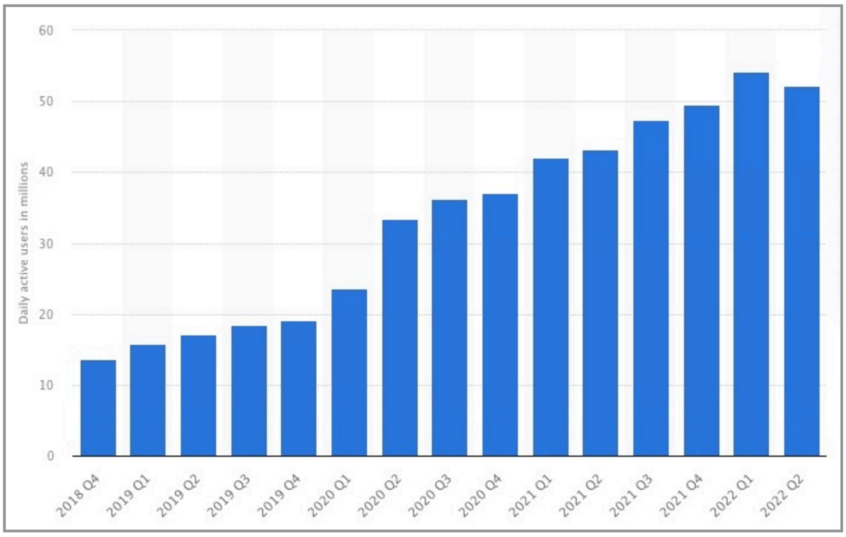

Figure 3: *Daily Active Users of Roblox Games Worldwide From 2018 Q4 to 2022 Q2*

Source: Statista 2022

The financial performances of each gaming companies in the pervious years were published on each websites. To investigate how the pandemic brought influences on the gaming industry, the sales and revenues in gaming department of Sony, Microsoft, Nintendo and Tencent, which are recognized as the top four video gaming companies in the world were collected in the Figure 4. From 2018 to 2021, overall, all the four companies showed an increased trend, especially the Tencent Holdings, which had the fastest-growing among the four. Between 2019 and 2020, except Sony Entertainment, all the three companies still obtained increasing revenues during the outbreak of COVID-19.

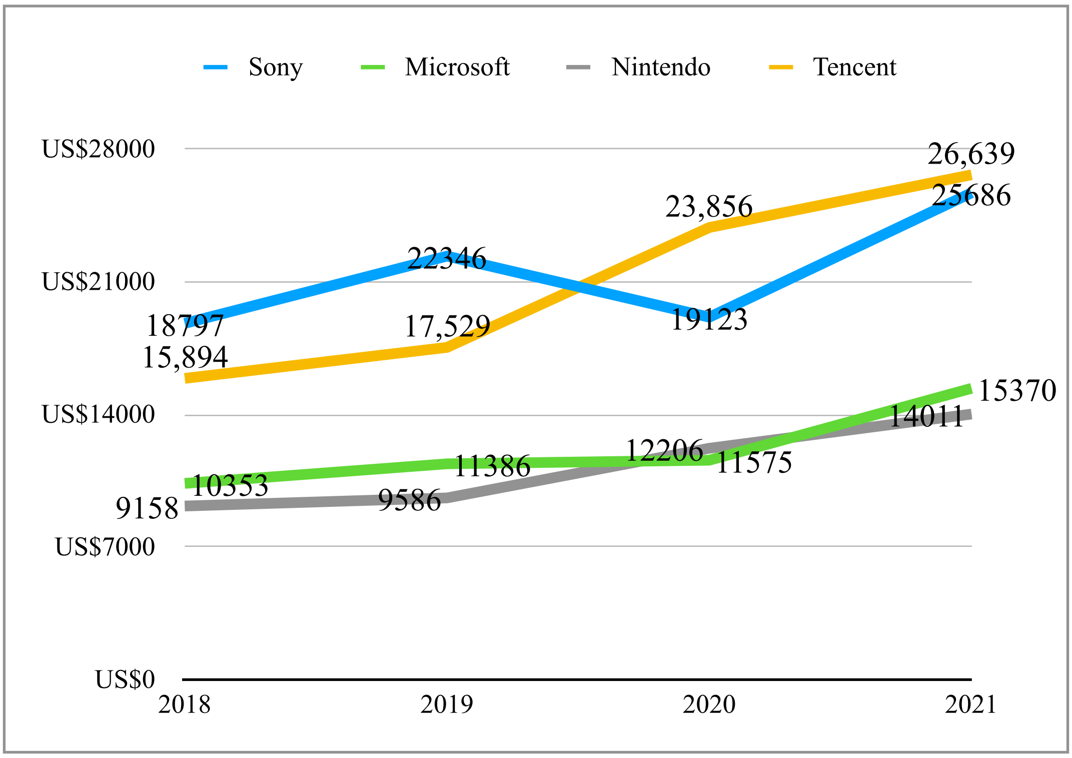

Figure 4: *Top Four Gaming Companies' Sales and Services Revenue in Gaming (in Millions)*

Source: Financial Statements From the Four Corporations From 2018-2022

2.1.2. Influences on Customer Behaviors

As the continuous spread of COVID-19, many solutions have been taken by governments since 2020, some public places could only open in the limited time, places like casinos, bars, amusement parks and shopping malls were even completely closed when the situation was seen to turn worse. Therefore, people were asked to stay at home, outdoor activities reduced and the need for home entertainment increased, activities including cooking, reading, playing online games and watching television were found to be popular choices. While impacted by COVID-19, the lower deliveries of new television shows led to a decline in this entertainment industry eventually (Sony Group Corporation, 2021).

The disruption raised by policy adjustment has changed people's daily life dramatically, especially during the first wave of the COVID-19 pandemic period (Bin, 2021). During the stage, people moved to remote work and study, because of the provisions of social distancing. The time of staying at home has increased much, the Internet and digital devices became the major daily use (Galán, 2021). Public social activities were reduced, many people had more spendable leisure time. Millions of people felt bored, anxious or stress at home, searching for new entertainments and social connection, who can be potential new customers of the gaming industry (Cabarcos, Soriano & Chousa, 2020).

Teleworking and online course became popular during the lockdown period, which could help maintaining the economic status through the most safety method. Since most of the people stayed at their own places, social activities, communication and traveling were reduced. Researches show that many people have turned to home entertainment, spend their leisure time through playing video games (Sener & Yalcin, 2021). Many players considered that games could bring positive impacts on their mental health and provide opportunities to socialize. Building friendships through playing games together became more and more popular within the young (Barr & Stewart, 2021).

According to the researches on Entertainment Software Association, 97% of American players treated playing video games as a beneficial activity, able to bring joy, provide inspire and relieve stress. And it also helpful for building skills, such as cognitive, creative, collaboration skills. Many people had a greater desire on playing games during the pandemic breakdown, especially the old players, since it can provide feeling of community and get connection with friends, family and the society. 73% of parents said that video games became a more needed break for their children during the pandemic (ESA, 2022). The correspondent of these phenomena was an increase in games consumption, mainly reflected in the sales revenue of gaming devices and in-game contents. Researches showed that the game purchasing is moving online, customers prefer digital games more than physical products (MyGames, 2021).

Video game is the second world for many people, it's a way to escape from the reality and is treated as an irreplaceable part of their lives. There're billions of people play games every day, transcending age, gender, nationality and profession. Nine in ten players said they spent as much or more time on playing video games during the pandemic period (ESA, 2022). A survey on the reasons for people like to play video games during the pandemic was conducted on Statista (Figure 5), which found that more than half of the respondents felt bored and wanted to kill time through playing, and 45% considered that playing games was a method to escape from the real world. Due to the lockdown solutions issued by local governments, daily outdoor entertainment including going to shopping malls, cinemas, casinos, clubs as well traveling were not allowed, people needed to seek for new home entertainments. Besides gaining pleasure, games were also an opportunity to communicate with friends and family who far away from as well as a channel to socialize with strangers (Clement, 2021) .

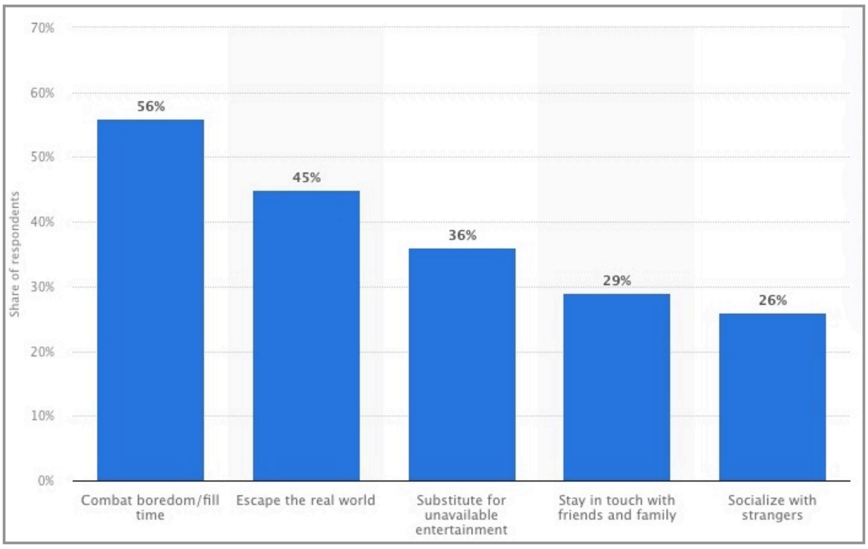

Figure 5: *Leading Reasons To Play Video Games During COVID-19 in the U.S. (2020)*

Source: Statista 2021

2.2. Types of Main Gaming Markets

Generally, the overall gaming industry are subcategories into two main transitional markets, console gaming and personal computer gaming. While as the social networks and smartphones developed, the market of mobile gaming developed rapidly (Clement, 2022). Therefore, it's reasonable to treat the mobile gaming market as another main gaming market.

According to the reports published on the Entertainment Software Association, there're 52% of players preferred playing on consoles in 2022, compare with the 36% in 2018, when was before the pandemic, had a significant increase of 16%. Compare with the other devices, console gaming is more traditional, but it still keeps developable and owns half of the market nowadays. Although the smartphones entered the video gaming market relatively late, it was ranked at the first place in the players preferences list since 2019, presented a higher and higher percentage from year to year, with 36% in 2018 and 70% in 2022, showed a strong foothold in the market. The personal computer market showed a great competition with the console market, this two markets had fights on the second and the third place in the industry in pervious years. Personal computer was the most popular device within the adult gamers in 2018, with percentage of 41. While in 2022, there're 43% of players preferred to use personal computers, which is the lowest among the three devices. The number didn't change a lot due to there're 60% of players use to play on more than one type of devices, and the most popular combination was mobile and console device. (ESA, 2018-2022).

Activision blizzard is one of the largest gaming companies in the world, which offers a variety of games available to play on console, computer and mobile devices. Therefore, it would be meaningful to look into the revenues structure of its game platforms, so as to investigate each gaming market's state of development as well as the customers preferences.

The annual reports showed that revenue from personal computer gaming was the lowest since 2018, and console and mobile devices had similar performances (Figure 6).

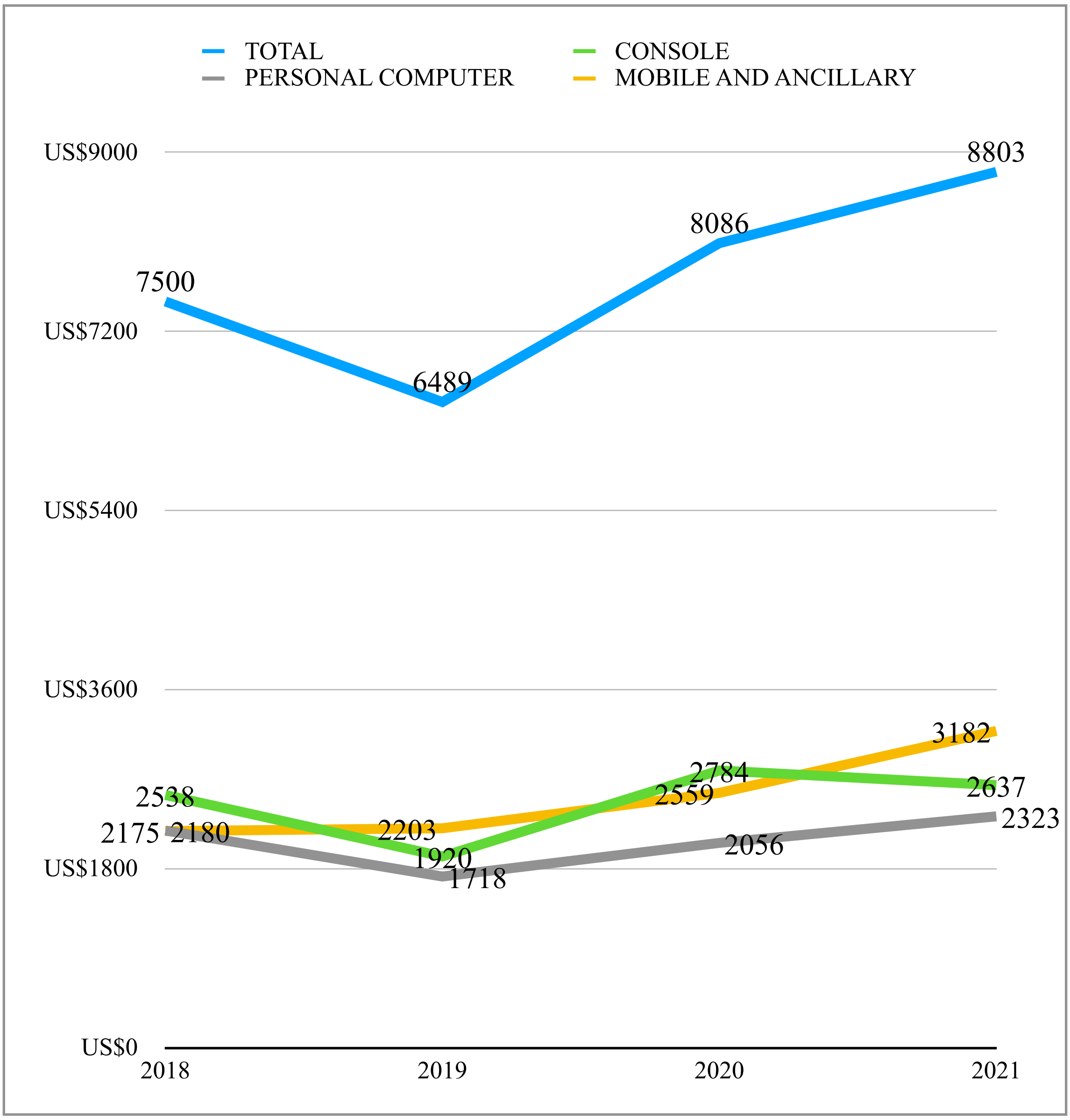

Figure 6: *Activision Blizzard Revenues From Gaming Platforms (in Millions)*

Source: Activision Annual Report 2018-2022

2.2.1. Console Gaming Market

Due to the COVID-19-related lockdown, there was a surge demand in electronic devices, but meanwhile, a continuous global scarcity of semiconductor materials occurred, the limited storage was only enough to support temporary, then the out of stock of console devices had lasted for a long time, especially after the new released PlayStation 5 and Xbox

Series, which had a huge demand from the customers. Some of the reasons behind the shortage are the surge demand in electronic devices and the tense relationship between China and the U.S. (Kondepudi, 2021). Besides the problem of component supply, the fluctuation from the foreign exchange rates also led to the result of decrease in game sales in some countries (Figure 4). Moreover, many retail stores were closed for the moment, the shipment service delayed a lot. These situation impacted the selling activities negatively, the gaming companies lost many market opportunities (Waber & Munyikwa, 2021).

Regarding the sales of in-game softwares, which are digital products did not impacted by the supply chain, as well as the number of PlayStation subscribers, had a significant increase (Sony Group Corporation, 2019). Accounting to the latest financial report of Sony entertainment, the PS5 consoles had a considerable sold with 25 million units. But meanwhile, due to the production cost increased, even the sales of console devices were grant, Sony still presented a decrease in gaming profits (Sony Group Corporation, 2022 Q2).

The manufacturing system slowdown due to game developers worked remotely which resulted in many problems and failures in designing and innovation process, disrupted the product release schedules, the long waiting for shipment brought more complaints from their customers, increased workers' stress and companies' cost eventually (Waber & Munyikwa, 2021). The 3A products are one of the critical reasons for players to keep their loyalty, while many gaming companies suffered a lot unsatisfied commons in recent years, such as 'same old stuff' and 'overflow of DLC' (Sener & Yalcin, 2021).

Faced the big challenge from the new market conditions and cruel competition from other gaming markets, console gaming companies was committed to make an innovation. Besides the traditional console devices, the Playstation VR also became one of the best-selling console accessories. While, although the PS4 device had a huge achievement in the gaming industry, more and more players moved to the mobile gaming from the console gaming (Cai, 2021).

Being a traditional video game marketer, the console market has experienced a lot since 1970s. Faced with the continuous challenges from computer and mobile gaming markets, which cost of innovation and development as well as the entry price for customers are comparative lower. Research showed that the new generation of players showed a great preference to computers or smartphones. While the console market still has its position, no matter players used to play on which type of devices, there're 73% of players own a game console (ESA, 2020). The console segment ranked second among the gaming industry, with $53 billion dollars annual revenue in 2022, which was only half of the mobile gaming segment (103.5 billion dollars) (Clement, 2022).

2.2.2. Personal Computer Gaming Market

The PC segment generated $35,9 billion in 2020, had a slight decrease from $37 billion in 2019, which was even less than half of the revenue of mobile segment ($77 billion) and performed the worst among the three main markets (Clement, 2021). While what is noteworthy is that the selling situation of hardwares still had an increase of 172% in revenue under this market condition, due to many non-gamers enter the market as well as the large demand of the new Xbox Series X|S (Wilde, 2021).

The Steam online gaming platform, as one of the largest computer gaming platforms, has increased more than 20% daily users during the pandemic (King, 2020). As showed in the chart from Statista (Figure 7), there was a sharp increased between August 2019 and April 2020, from 15.99 million to 24.54 million, and then reached a peak of 26.92 million concurrent Steam users in April 2021. The growth rate in previous two years is relatively high over the whole timeline.

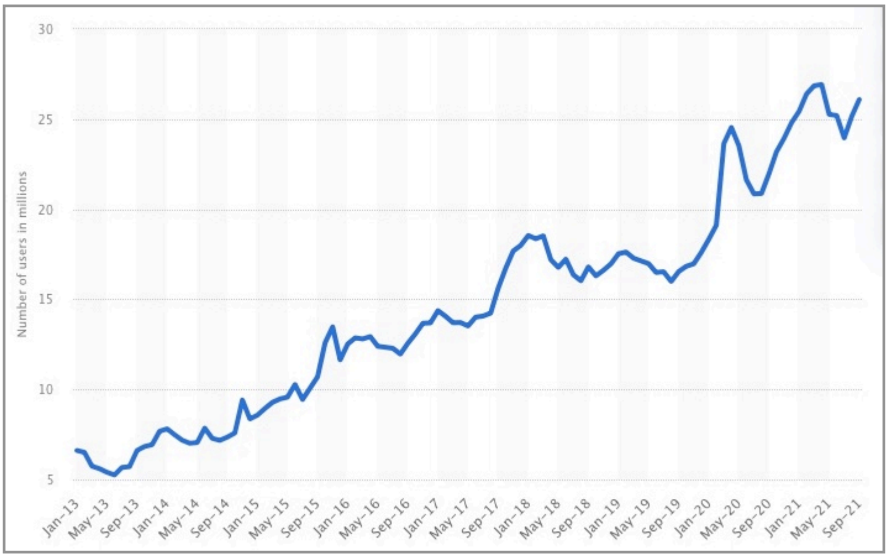

Figure 7: *Number of Peak Concurrent Steam Users 2013-2021*

Source: Statista 2022

Similar situation to the console gaming market, supply problems raised by the pandemic also existed in the computer gaming market. The shortage of chips also negatively impacted the sales of high-end personal computer devices (Wijman, 2021).

2.2.3. Mobile Gaming Market

The mobile gaming market kept being the biggest gaming segment since 2018, in the aspect of financial performances and market scale. The success continued during the pandemic period, with over $77 billion in 2020 and more than $90 billion annual revenues in 2021, with Tencent Holding Limited as representative, who generated more than $146 million monthly app revenues (Thomala, 2022). Tencent has become the biggest gaming company nowadays, owns various controlling stakes of mobile gaming companies worldwide, which is from the biggest gaming market — China.

The financial reports also showed that the mobile gaming market had over 2,5 billion players, with a 12% increase in 2020 (Cai, 2021). The average in-app purchases per user had also increased during the COVID-19 pandemic, especially during the second quarter of 2020, when the lockdown policy was tighten up, had totally $19 billion revenue (Clement, 2021).

According to studies on IDC (International Data Corporation) and LoopMe, 63% of survey respondents have increased their mobile gaming time during the pandemic, with 6% newcomer. The result showed that the mobile gaming activity increased more in the countries with the higher COVID-19 death rate, with percentage of 75, and which implied there might be a larger pullback in these countries once the pandemic has subsided (Shirer, 2021).

2.2.4. Rise of Cloud Gaming

Along with the technological and economic development, the rise of cloud gaming market is remarkable. Many marketers and researchers considered that the could gaming would play a major role in the future of the gaming industry. Cloud technology allows users to stream and play their favorite games online directly, without concerning about the purchase of gaming devices or specific hardwares. Different from the traditional games which need to purchase as physical media or download programs, clouding gaming frees the players from the limitation of technical and quality (Aumont, 2021).

It brings many benefits to the majority of the customer, including no device limitation, lower cost in game purchasing, better data saving security, open access to various games and availability of sharing games between friends, which are the competitive characteristics of the cloud gaming (Game Marketing Genie, 2020). There're also some potential advantages for the game developers with cloud technologies, such as reduce testing costs, higher profit margin and avoid privacy. It's also an opportunity for mature gaming companies to refresh their business and create new demands (Mariano, 2015). Although this new emerging gaming service is still an immature technique, many marketers keep entering the cloud gaming market and try to find out a solution to take advantage on this emerging technology, with

Google Stadia and Nvidia GeForce Now as representative (Aumont, 2021). The cloud gaming avoids many rigid requirements in pc and console gaming, it has no doubt that become a huge challenge for the traditional gaming markets to survive in this potential coming revolution, especially along with the pandemic influences.

The leading console gaming company, Sony was one of the few companies that believes cloud gaming would become big in the future and bought Gaikai and OnLive early in 2012, planned to develop the PlayStation Now cloud gaming services. While Sony didn't pay much efforts on it, Gaikai almost stopped developing later. Meanwhile, some seniors in PlayStation Now believed cloud technique could bring fresh to the gaming industry, therefore turned to Google and became parts of the Stadia developing team, which is the front-runner in cloud gaming currently (Hollister, 2019). As the digitalization and technology developed, more and more gaming companies realized that the cloud technology would play an important role in the future of game industry eventually. In 2019, Sony decided to team up with Microsoft to develop cloud gaming technologies finally (Microsoft Azure) in order to beat Amazon and Google, to stable their leading places in the gaming market (Warren, 2019).

2.3. Conceptual Model and Research Hypothesis

In this dissertation, the research questions are devoted to find out if the COVID-19 which has worldwide spread since 2019 had impacts on the business activities of the gaming industry, in positive or negative aspect? And on the other hand, due to the outbreak of the pandemic and relevant lockdown solutions, if there's any influences on the customers of the gaming industry, including playing behaviors and experiences.

A series of researches on the business activities and economic performances of the gaming industry in pervious years would help to produce some findings. In addiction, a survey was launched in order to investigate how the customers behaved during the pandemic, and if the collected results harmonized with the pervious findings. And how the changes in the customer behaviors resulted in the gaming industry performances. Since the pervious researches showed that the gaming companies had their revenues and registered members increased, therefore, the survey would investigate the proportion of new players entered the gaming markets after the COVID-19 outbreak and if players spent more time and money on gaming. And if the reasons for these changes in behaviors related with the COVID-19.

Chapter 3: Methodology

This chapter is focus on studying if and how the COVID-19 pandemic impacted the customer behaviors, classify the factors that made people turn to play video games, also the type of platforms people preferred to play on and the relevant reasons. The sources of the obtained informations are from both primary data (quantitative data) and secondary data (previous researches).

3.1. Data Collection

The data collecting process in this dissertation includes collecting primary datas from the target population through an online survey and synthesizing information from previous papers and researches.

3.1.1. Primary Data

A descriptive approach was applied through an online questionnaire to collect necessary primary data, including the target population’s playing habits and personal experiences. Since this dissertation was doing researches within the electronic field, the survey was only launched online to reach the target population through social medias.

3.1.2. Secondary Data

Secondary data was collected from the previous researches, reports and papers which related to the gaming industry’s performances before and during the pandemic, to investigate if there’s any significant changes in recent years, including both positive and negative aspects. The collection of secondary data is an on-going activity throughout this whole research process, in order to take the latest news of the gaming industry and COVID-19 related informations into consideration.

3.2. Questionnaire Design

The survey is an online questionnaire opened for the target population and was spread through WeChat, Weibo and survey website in China. Most of the secondary data are from the previous reports and researches which had investigation and being published in European and America, therefor the informations from Asian area is comparatively few. The purpose of this survey is to integrate people's experiences of playing video games during the pandemic outbreak in China, so as to analysis if the pandemic had impacts on customer behaviors in video gaming markets, figuring out if the main findings from the survey and pervious studies have a harmonious conclusion.

At the beginning of the questionnaire, there's a paragraph of tooltip which informs the respondents only if they had experiences on playing video games after the outbreak of COVID-19 and were above 18 years old, that can participate in the following survey.

The major part of the questionnaire includes 8 questions (7 option questions and 1 open question): if the respondent started to play video games (a new player) during the pandemic (since 2019), how often did the respondent play video games, how many hours did the respondent spend on playing video games each time, if the respondent spent more time on playing video games during the pandemic related lockdown, if the consumption on games increased during the period, why the respondent feel like to play games, which platform did the respondent used to or prefer to play on and why. The full initial version of the survey which is in Chinese is given in the annexes, as well as the translated version in English.

The first, fourth and fifth questions are 'yes' or 'no' questions, related with the respondents' profiles. The second and third are single choice questions about the frequency of playing games.

The sixth and seventh questions are multiple choices. There're six options in the sixth which is about the reasons of feeling like playing games, including feeling bored at home, feeling relax during gaming, gaining happiness during gaming, helping reducing pressure or anxiety, keeping contact with friends and providing opportunities to meet new friends. In case the interviewee felt being limited, a blank is offered for filling the other reasons. Same for the seventh question, which is about the major platforms the interviewee preferred to play on, besides console, personal computer and mobile devices, in case there were other type of preferences, a blank is offered. And the eighth which is the last question, it's an open question about the reasons why the chosen platforms being preferred by the respondent.

3.3. Sample Design

3.3.1. Target Population

Since there may have limitation on time of playing games for the minors, the target population of the survey is the group of people who have already reached an adult age (18) and had experiences on playing games during the pandemic period (2019/12 ~ 2022/10), including new and old gamers. Since the gaming industry welcomes all kind of people, so this survey welcomed respondents without limitation on gender, religion or occupation. In this case, the survey was only spread within the Chinese social medias, the respondents are Chinese from different background.

3.3.2. Sample Profile

There're totally 225 samples were collected, which was composed by 88 new gamers, accounting for 39.11% of the total samples, and 137 old gamers, accounting for 60.89% (Figure 8). This composition structure reflected that there's a remarkable amount of customers entered the video gaming industry after the pandemic outbreak in China, which is consistent with the findings of increasing demand for video games and many new active players on game platforms in the previous studies.

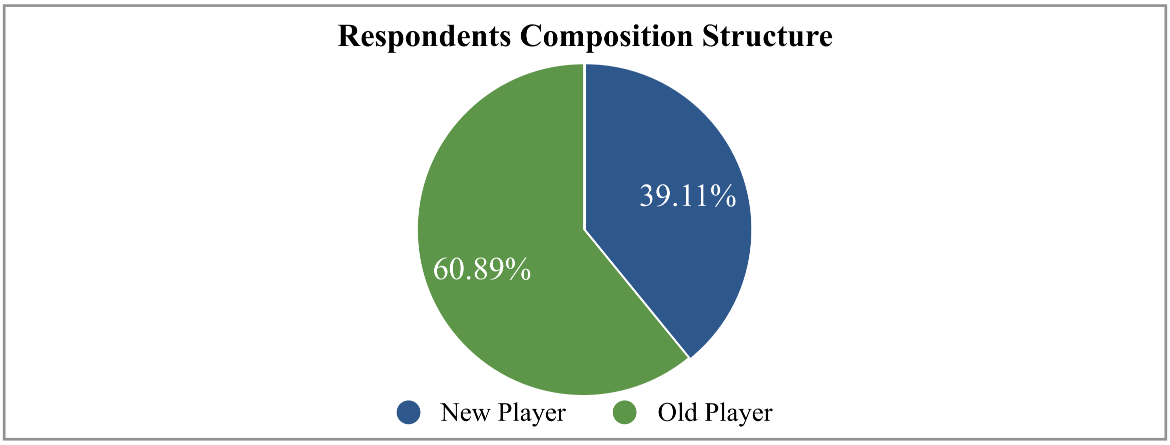

Figure 8: *Composition Structure of the Respondents*

3.4. Data Analysis

The survey was launched on social medias in China, where respondents were answered in Chinese. Therefore, the initial collected data from online survey were translated into English before going into further analysis.

Since the open question in the survey is qualitative data, which is non-numeric and semi-structured, it's necessary to organize the data and find meaning from them (Bingham, 2022). In this case, the inductive analysis was applied, open coding were developed from the respondents' original words.

There're totally 225 respondents in this survey, the collected answers were the independent original data, and then were manually coded according to themes present in each data, so as to sort them into categories and produce findings to answer the research questions finally. Table 2 has listed a part of original qualitative data and corresponding open coding.

Data	Code
Smartphones are more convenience to carry out when compare to computers, can be used anytime you want.	Convenience No place or time limitation
There're more varied games available in computer gaming platforms, and can be downloaded easily, the big screen of computers also bring better sensory experience in games.	Varied games available Easy to download Big screen Good sensory experience
Consoles own many exclusive video games and have a great image quality.	Exclusive games Image quality
Mobile games are easy to learn, my friends also like playing on it.	Simple operation Play with friends

Table 2: *Partial Data and Open Coding*

Chapter 4: Obtained Results

4.1. Descriptive Statistics

As showed in the Figure 9, most of the respondents played video games once or twice a week, which account for 36.89%. And there're more than 30% of respondents played games almost everyday.

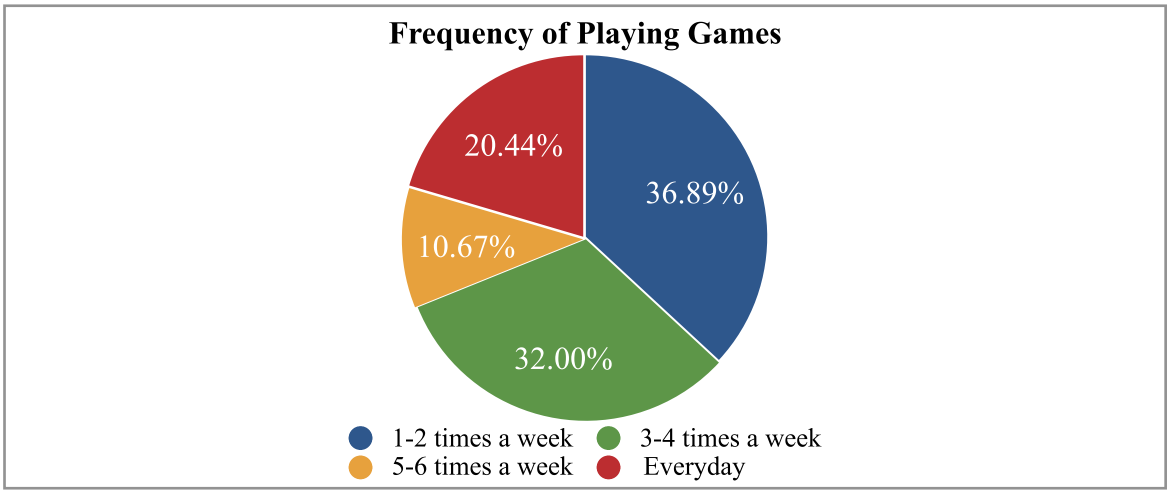

Figure 9: *Frequency of Playing Games*

There' re almost half of the respondents used to play video games less than 2 hours each time, and only 8% spent more than 4 hours on gaming each time. Although many of the respondents being active online during the period, while they would not spend a lot time on gaming each day (Figure 10).

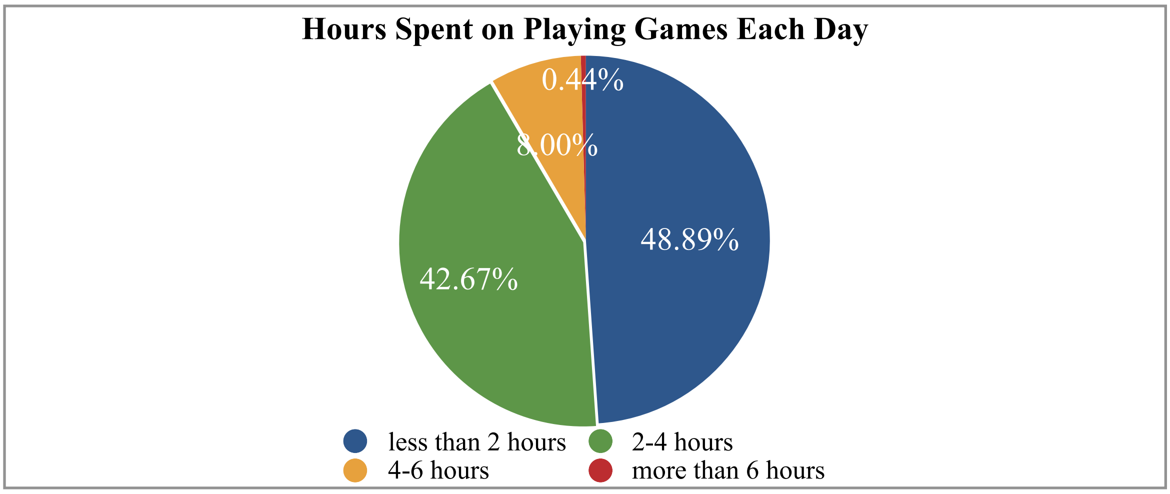

Figure 10: *Time Spent on Playing Games*

The collected responds of the survey showed that 72% of the respondents spent more time on gaming after the pandemic outbreak, which consist with the previous findings, a significant increased in the daily active players on video game platforms (Figure 11).

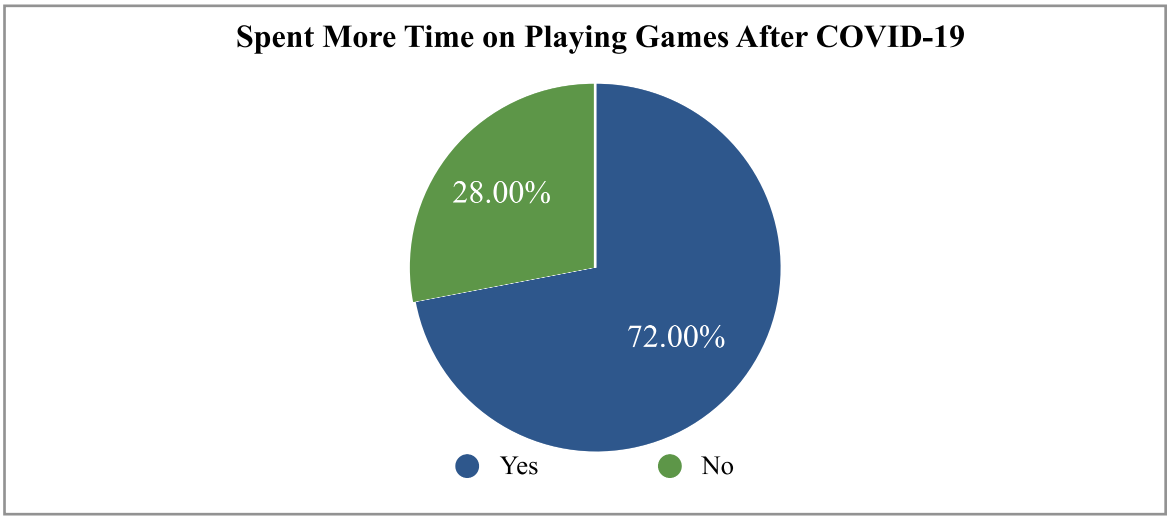

Figure 11: *Spent More Time on Playing Games After COVID-19*

Take a more detail check within the respondents who spent more time, the proportion of new players and old players is 45% and 55%, and 61% of them had more expenses on playing games (Figure 12).

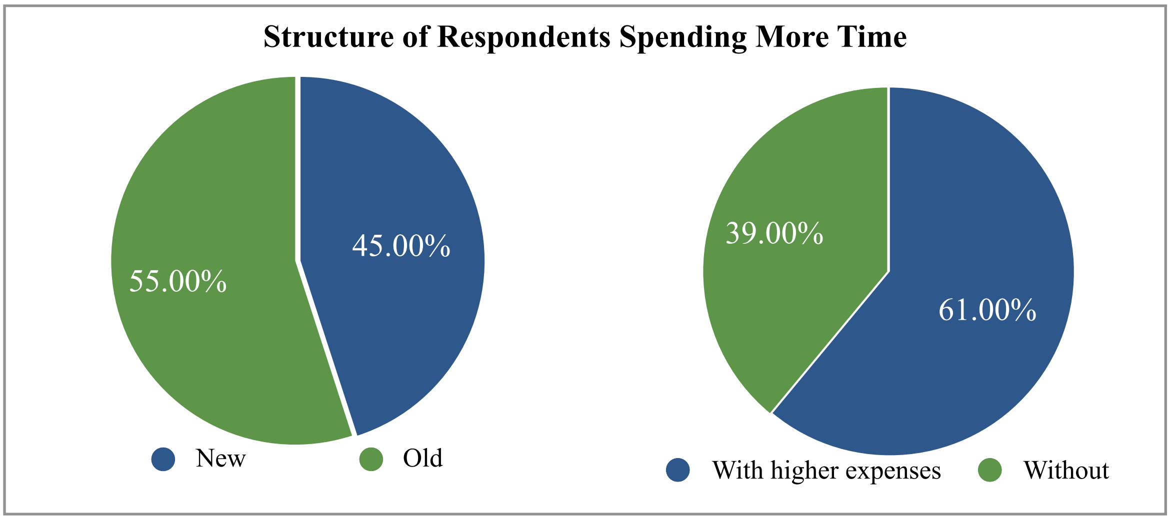

Figure 12: *Structure of Respondents Spending More Time on Gaming*

The change in consumption behavior showed a half-half situation before and after the COVID-19. According to the previous findings, 72% of respondents spent more time on gaming, the increased in consumption is reasonable (Figure 13). New players entered the gaming industry who applied membership of gaming platforms also one of the reasons of increasing expense.

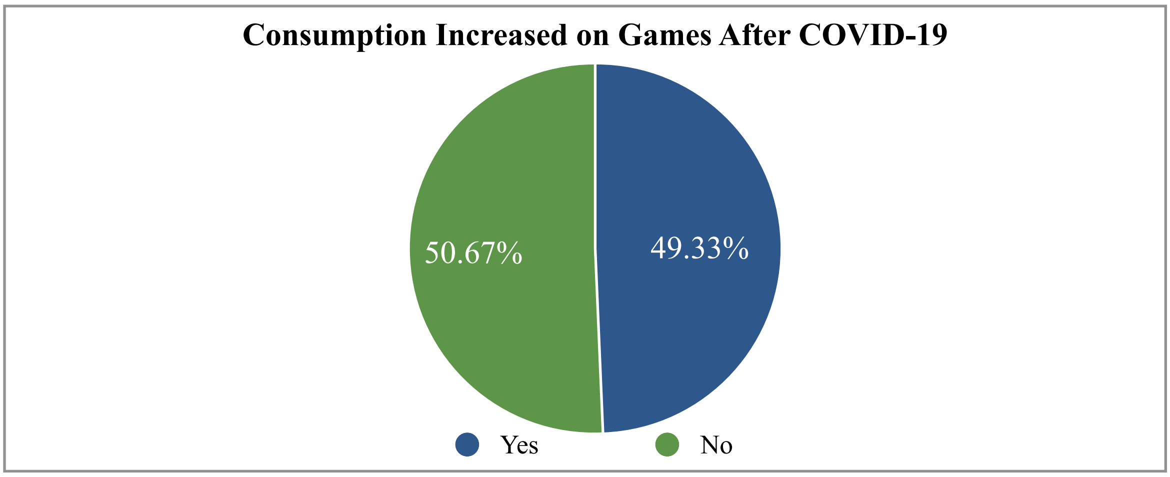

Figure 13: *Increased Consumption on Games After COVID-19*

Many researches found that a greet amount of people have turned to play games during the pandemic period, therefore, it's necessary to figure out the reasons why they made this decision. Out of the 225 respondents, 145 agreed with 'boring at home', accounting for 64.44%. There're about 60% felt that games could bring them relax as well as happiness. And more than half of the respondents considered playing video games can help reducing pressure or anxiety. A part of the respondents also thought that they could build friendships through playing online together (Figure 14). The total percentage was higher than 100 due to multiple choices, same for the Figure 15.

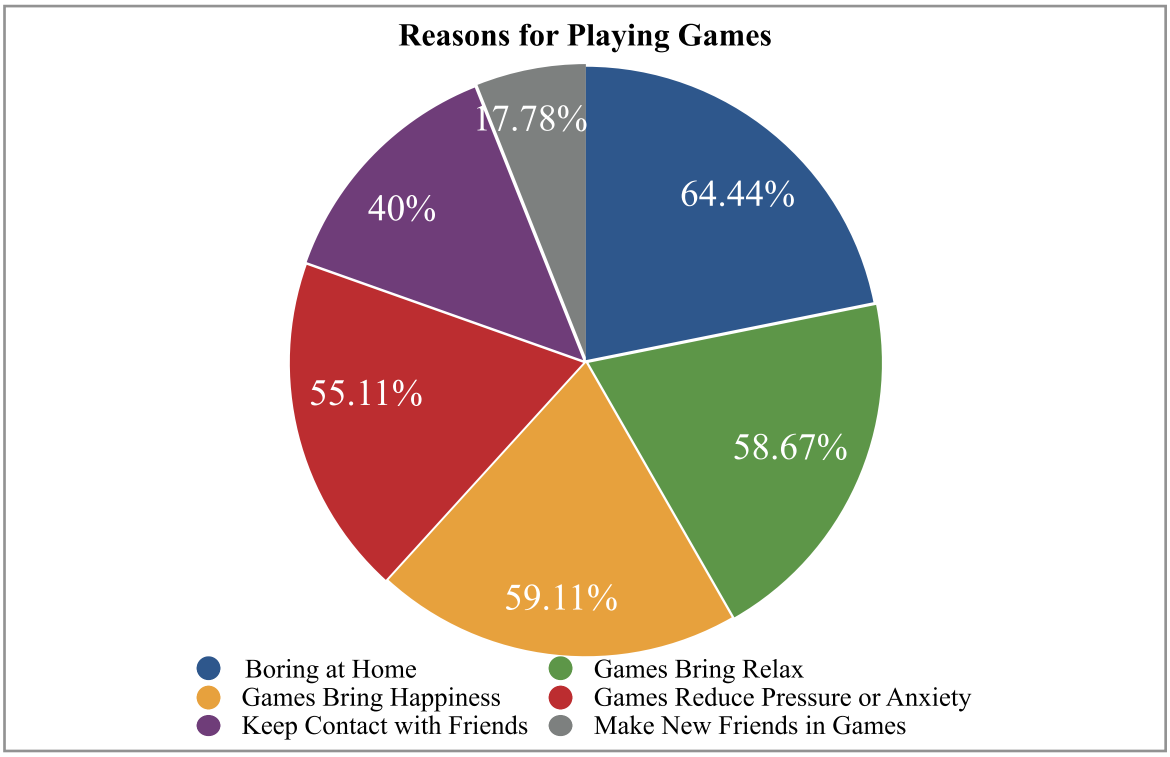

Figure 14: *Reasons for Playing Games*

The composition of the devices preferences of the respondents are presented in Figure 15. There're more than 70% of the respondents preferred to play with mobile phones, which is almost the sum of the players of console devices (32%) and personal computers (41.78%). There're 2 interviewees responded that they also like playing motion sensing games and webpage games. The structure of these 225 players showed a similar finding in the '2022 Essential Facts About the Video Game Industry', which showed that the percentage of players preferred mobile devices was 70%. While there was more people prefer consoles than pc in America. The console devices is less popular in China, one of the major reasons is that there're some limitation and unavailable on the in-game contents in Chinese market.

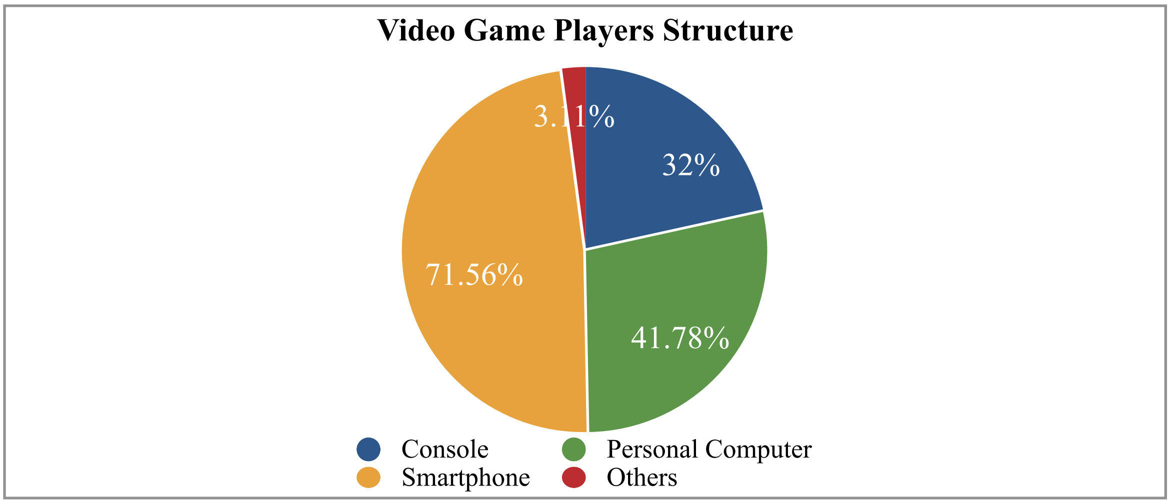

Figure 15: *Devices Preferences of the Respondents*

Take a more detail look in this composition structure, there're 139 respondents preferred to only play on one type of devices, the remains were used to play on two or more platforms. The Figure 16 clearly showed that there're 93 respondents were loyal mobile devices players, which was much more than the players who loyal to consoles (17) and computers (29). And there're only 64 respondents, which accounted at 28.44% of 225, did not play on mobile phones. Although 72 respondents played on consoles, 76.39% of them also played on others. A similar situation showed in the structure of personal computers' players, beside computers, 69.15% of them also enjoyed playing on other devices.

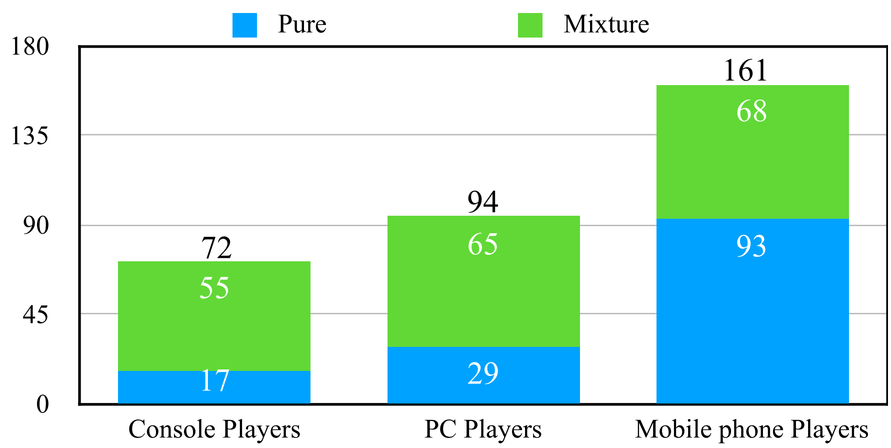

Figure 16: *Devices Preferences of the Respondents (Detailed)*

The last question collected the personal opinions and attitudes of the respondents, in order to have a deeper understanding of different type of players. For the respondents who preferred console games, given reasons including ‘higher requirement on images quality’, ‘own the playstation-only games’, ‘better operation design and sensory experiences compared with pc and mobile games’ and ‘usually play alone’.

Some different opinions were collected from the pc games players, some of them considered that ‘prefer to operate with computer keyboard and mouse’, ‘help strength the flexibility of fingers’, ‘convenient to play on computer’, ‘computer has better quality game functions’ and ‘more games compatible and easy to download’.

The largest composition of the respondents were mobile gamers and most of them given keywords of the reasons were ‘convenience and low cost’, ‘easy to learn and low entry-level’, ‘without place or time limitation’ and ‘play during leisure time’. It’s noteworthy that most of the respondents who prefer the console games or pc games also played on mobiles.

Beside the respondents who used to play on all the three types of devices, the most popular combination was personal computer and mobile devices, followed with the console and mobile devices. The mobile gaming was no doubt the most popular within the respondents (Figure 17).

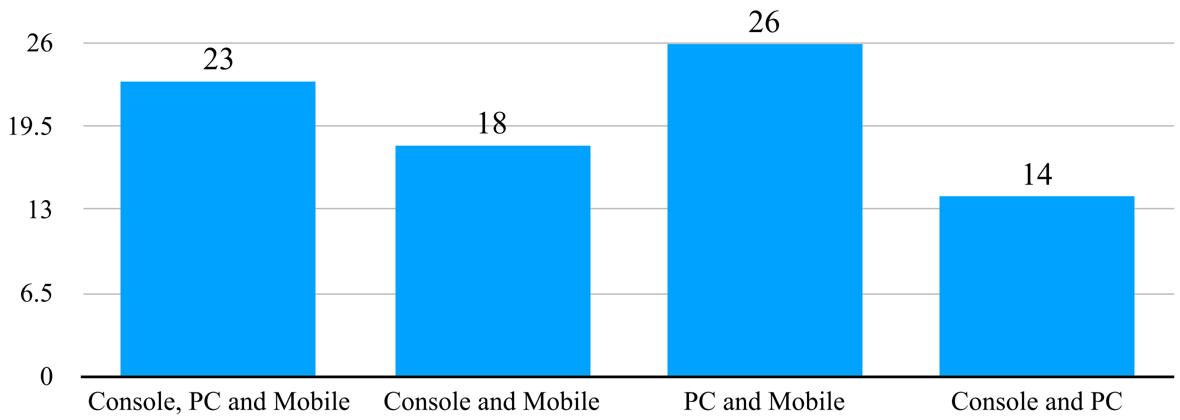

Figure 17: *Structure of the Preferences Devices*

4.2. Main Findings

4.2.1. Influences on Gaming Industry

From a series of investigation of the pervious researches and articles, some findings and theories can be obtained. In generally, the gaming industry presented a positive economic performance during the COVID-19, different from travel, apparel and other entertainment industries. The positive outcome mainly displayed in the increasing revenues in the sales of gaming devices and in-game contents. Video games always play an important role in modern people life, and became more popular in this pandemic period. Due to the outbreak of COVID-19, people spent more time at home and had more home entertainment activities. Whether console game, computer game or mobile game platforms, many of them had a significant increasing amount of new register members, these new customers brought a considerable revenues to the gaming industry, including expenses on the gaming devices, single games and platform memberships, etc.

Some gaming companies observed these on-going variations in the industry and took a series of corresponding reactions to stabilize and even strengthen these positive phenomenons. In order to attract new players to enter the gaming market, some free demo of video games were opened for all kinds of people, without compulsive requirement to be a membership (Perez, 2020). The free trial of platform memberships were also provides, where players can have an experience on all the membership rights and advantages without expense. These kinds of special offers could attract people attention and stimulate their interest to play the video games offered, because for the people who stayed at home and had many leisure time was boring anyway. Although the trial period was for free, the game platforms gained many new potential customers. On the other hand, these activities could also help building the old customers loyalty. Players would considered that platforms which have special offers would also have better services. In the case of consoles and computer game platforms, the old players would feel having more advantages on playing games, since they already had devices, therefore only need to go download the contents, without costing a cent. While for the new players would need to pay an entry price.

Since the activities of gaming companies are mainly focus on the electronic field, the business did not have much negative impacts from COVID-19, the revenues from digital games sales and platform memberships kept raising in the pervious years, showed positive performances overall. While regard the sales of physical products, a significant decreased was presented, due to the closure of retail stores as well as the disruption of shipments service. The fluctuation in foreign exchange rate due to the economic disruption by the pandemic also had impacts on the revenues.

In case of producing new products, some general problems related with the pandemic also performed in the game industry. Under the continuous spread of the virus, the industry was forced to shift to remote work, in order to reduce direct contact. While there're trade-offs between restrictions and economic activities. It's inevitable that the efficiency of workers decreased when they suddenly start to work in different conditions, even the industry had great confident preparation on it. Many mistakes happened due to lack of timely communication between workers as well as increasing stress of the game developers. For the gaming industry, it's difficult and sometimes even unable to have innovation projects experiments at home. Many companies had their new products release delays, which costed those companies millions of dollar, the longer the time delayed, the higher the cost, and also higher the pressure of the developers.

According to the pervious reports of gaming companies, many of them suffered shortages of basis components, due to the lower productivity of suppliers. Many of the gaming companies have their products supply and manufacture all over the world, in order to lowest the production costs. However, as the COVID-19 spread around the world, suppliers suffered at a different level, followed by product-line disruption which resulted in chaos and led to delay in the production eventually. These problems happened more among the console and computer gaming markets, related with the supply of gaming devices and physical gaming products.

In addition, the governments operated various of regulations to cope with the pandemic, meanwhile, brought some negative impacts on the business activities. The countries where experienced a serious viral transmission still tried to seek out a measure to balance this situation. Therefore, whether the regulations would support the researches on innovation gaming projects, became one of the important factors for the development of gaming companies.

4.2.2. Influences on Customer Behaviors

The worldwide spread of COVID-19 brought influences on every classes and societies, countries which have more daily diagnosed cases, have more fluctuation in people's regular life. Since the COVID-19 had constant variation and uncertain negative impacts on people' s health, governments announced series of limitation on business and social activities. Therefore, with considering their personal health and government solutions, people reduced their outdoor activities and then, started seeking for more home entertainments. Rather than shopping or traveling, activities like reading, cooking and playing video games being more popular during the lockdown period.

From 2019 to 2022, the number of daily active online players showed a significant increase. People spent more their leisure time at home, old players who like playing games usually spent even more time and had more expenditure on gaming. It was relatively a bit easier for them to get used to the lockdown situation compared with the people who preferred outdoor entertainments. On the other hand, many non-gamers started to play games during this period, most of them considered that games could help killing the boring time. There're many other reasons why people who did not use to play video games start to enjoy gaming. Since many public places were closed, people could not have social activities with their friends, the game platforms became new channels for people to communicate their friendships. Online gaming brought different groups of people together, players could also social with strangers, just like a second world. Since people spent more time at home, playing video games also became a family activity which could help creating a cheerful family atmosphere. During the pandemic, video games brought players the feeling of social connection when the social distancing was required, instead of feeling being isolated.

Many researches showed that there're more people getting anxiety and depression during the pandemic lockdown period, and many players considered that playing games could help releasing their pressure of daily life and brought pleasure. Many people had their works being disrupted or health situations became worse, playing games became a way to escape from the reality for a short time in these cases.

Both the pervious researches and the online survey found that players believed that they could benefit much from playing video games. During the pandemic, many parents allowed their children to play more video games, they considered that playing video games was not only a source of pleasure, but also could be educational. People worked and studied more over networks in this special period, which was much differential from the face-to face. Many problems showed up, including unstable networks connection, difficulty concentrating and information misunderstanding. Then many educational games were found to be an effective method for children and students to learn (ESA), which could built connections with the distance learning. Moreover, playing video games became an attractive activity that could keep children staying at home safely, when the outdoor activities were not allowed.

Studies showed that stay at a same environment for a long time could also brought people passive psychology, due to lose the opportunity to get contact with social groups, the ability of communication, execution and expression will decline gradually. Same in the health situation, reduce in exercises and irregular daily routine also bring negative impacts. The lockdown kept people away from the virus, while health problems still exist. In this case, gaming brought people pleasure and opportunity to play together online, keep having connection to the world. Some motion sensing games were integrated into exercises, people could play this kind of games in place of going to gymnasium.

Although the pandemic had influences on the customer of the overall gaming industry, the customer behaviors of console, personal computer and mobile game markets showed a little bit differences. According to many researches, although people spent more time at home, some of them needed to work for a longer time, due to the lower efficiency (Nicola, 2020). In this case, people would prefer to play on mobile devices to relieve stress, give a simple break to the tired brain.

The major factors that affected the respondents choose to play on specific devices have listed in the Table 3. Although different reasons and personal experiences were given by different type of players, they have common opinion, to some certain degree. The console players and pc players had agreements on these two game devices have better sensory experience and provide more comfortable operations than mobile devices. Another crucial factor is that the most traditional and classical games are usually only available to play on consoles or computers. On the other hand, the pc players and mobile players also have some unanimous views, they considered that these two type of devices are more convenience for daily use. Rather than console players who usually play alone, computer and smartphone players preferred to play online with friends. Many of them entered these two games markets through being recommended and invited by their friends, in order to play some specific games online together. These initial informations reflect some common findings with the previous literature research.

Devices Preferrence	**Mentioned Frequency (Impact Factors)**
Consoles (N = 72)	Feel enjoy (24) Interesting games (8) Convenience (6) Kill time (4) Play alone (3) Good sensory experience (3) Play with friends (2) Comfortable operation (1)
Personal Computers (N = 94)	Feel enjoy (27) Interesting games (9) Convenience (7) Play with friends (6) Kill time (5) Comfortable operation (5) Good sensory experience (4) Varied games available (3) Big screen (2) Play alone (2) Exercise fingers' flexibility (1)

Smartphones (N= 161)	Convenience (72) Feel enjoy (47) Simple operation (15) Play with friends (9) No place or time limitation (8) Leisure time (6) No extra or low cost (3)

Table 3: *Mentioned Frequency of the Respondents*

For the gaming industry, each old customer can be a media to introduce new customers. Researches showed that a great proportion of players was introduced to play video games by their friends, “play with friends” became one of the important reasons why more and more people start to play games online, especially during the pandemic. Hence, under these market conditions, it can be a good opportunity for gaming companies to show their advantages to the customers.

Chapter 5: Conclusion & Recommendations

5.1. Major Conclusions

The COVID-19 pandemic brought significant impacts on both economic and people's health, and which will continuous to reverberate throughout the world in the future. Therefore, many studies have been taken to analysis the present situation, in order to overcome the potential following challenges in the future.

The findings of this article show that although the pandemic brought negative impacts on most of the business industries, however, overall, the gaming industry presented a positive performances. Under the continuous worldwide spread of COVID-19, the gaming industry showed an increasing trend in the revenues, whether console, personal computer or mobile game segments. Though supply problems and deterioration in market conditions effected the business activities, the increasing sales abled to offset these losses for the moment. However, the COVID-19 will continuous exist in the following years, the production costs increased much as the disruption in supply-line occurred from time to time, the positive performances in sales might not be able to support the business for a long time. Therefore, to survive and keep advantages in the market, the gaming companies need to figure out solutions to measure these problems and prepare for the constant unstable economic environment as soon as possible eventually.

Under the same market conditions, the mobile game market showed a more positive development trend compare to the console game and computer game markets, mainly due to the reasons of usableness and lower entry requirements for customers as well as the relatively lighter negative impacts from the pandemic. Many studies considered that the mobile game market is expected to be the leading role in the gaming industry, has great potential development in the future.

In regard to the changes in customer behaviors, presented positive influences for the gaming companies. The lockdown and limitation measures issued by governments brought people different daily routines, which raised some problems in working, studying and mental health. Playing video games became a great choice for many people to release stress, obtain social connection, keep exercises as well as gain pleasure. It's also an increase activity during the pandemic, one of the most popular home entertainments. Many people had more leisure time at home, which is one of the major reasons of why the gaming industry had a significant increase in the number of customers and product sales. Most of the old players felt enjoy that they could have more leisure time to play games, therefore, not surprising, had more expense on gaming. Regarding the new players, who treated playing games as a new entertainment to kill time, can be potential customers for the gaming companies. The future behaviors of them will depend greatly on if they feel benefiting from gaming.

As the vaccines of the COVID-19 developed and put into use around the world, some countries have loosen the lockdown restrictions, people started to move back to the usual life. However, according to a few researches, majority of players said they would like to continue playing video games even after the pandemic lockdown period. On the other hand, whether the gaming companies can retain the new customers also depend on the quality of devices, gaming experiences and the after sales services the companies offered.

5.2. Limitations to Study

There' re some limitations need to be acknowledge in this study.

Firstly, the online survey related with the quantitative approach was launched on Chinese website, which limited the respondences' nationality. And it's necessary to acknowledge that the console devices are relatively less popular in China due to some limitation policy. Hence, the available choices for customers in China were narrowed. In this case, the collected data would have influences in some level.

Secondly, since all the respondents answered in Chinese, therefore, for presenting in this study, the data were translated into English before further analysis. There might be a certain deviation during the process, especially in the open question. In addition, the defined answers given in the multiple choices of the survey may create some inaccuracy of the collected data, limit the expression of the respondents.

Finally, this study is related with the COVID-19, which is not ended so far. While the collected data from both pervious researches and online survey are from the time before October 2022. Therefore, it's impossible to have a comprehensive analysis of the develop of the gaming industry and the changes in customer behaviors, since it may have different influences as the new variants of the virus emerge.

5.3. Future Research

There are some meaningful findings through comparing and analyzing the initial survey and previous literatures researches, which are expected to be able to contribute to the further study about the relationship between COVID-19 pandemic and gaming industry, offer opinions on the development of console, pc and mobile game markets as well as the competitive factors and problems of them. Provide gaming companies informations to help them figure out better operation and marketing strategies, identify new business opportunities so as to how to survive in this dynamic environment.

Researches in this area will keep continuous in the following years, since the pandemic will still exist in the world for a long time. The continuous variation of COVID-19 also has different influences on the governments solution, which will bring different impacts on the business environment. The virus will still be a part of people's life, people behaviors will rest greatly with their attitudes on the COVID-19, which will influences whether people will spend more time on outdoor activities or home entertainments. This study need to have further explore of the relation between people’s behaviors and the COVID-19 pandemic, so as to predict the trend in the future. In addiction, the governments policy is another critical factor for the economic developments and people’s daily life. Therefore, the future research also need to understand the local solutions that related with the pandemic.

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Annexes

https://www.wjx.cn/vm/tHoRfDy.aspx#

疫情期间有关玩电子游戏的调查问卷

本次的问卷调查将用于本人的研究生论文，目的是了解疫情对游戏玩家的行为带来的影响。

如果您在疫情封锁期间有玩游戏的经历，并且是18岁以上的成年人，欢迎您来参加本次的两分钟调查，现在我们就马上开始吧！

1. 你是在疫情期间（2019年末-至今）才开始玩游戏的吗（新玩家）？ [单选题] *

○是

○否

2. 多久玩一次游戏？ [单选题] *

○每周有1-2天玩

○每周有3-4天玩

○每周有5-6天玩

○每天都会上线

3. 每次玩多长时间？ [单选题] *

○2小时以下

○2到4小时

○4到6小时

○6小时以上

1/2

https://www.wjx.cn/vm/tHoRfDy.aspx#

4. 你有在疫情封锁时期花更多时间在玩游戏上吗？ [单选题] *

○是

○否

5. 是否在疫情出现后在游戏上有更多的消费？ [单选题] *

○是

○否

6. 为什么想要打游戏？ [多选题] *

□呆在家无聊

□玩游戏时感到放松

□玩游戏时感到愉快

□玩游戏可以减少压力或焦虑

□通过游戏可以跟朋友保持联系

□可以通过游戏认识新朋友

□其他原因 _________________

7. 喜欢或习惯玩哪种游戏？ [多选题] *

□主机游戏

□PC 游戏

□手机游戏

□其它 _________________

8. 为什么选择以上种类的游戏？ [填空题] *

____

2/2

HTTPS://WWW.WJX.CN/VM/THORFDY.ASPX#

Research on Experiences of Playing Video Games During the Pandemic

The following questionnaire is dedicate to a Master dissertation with the purpose of understanding the impacts of pandemic on customer behaviors in games industry.

If you are above the age of 18, and had experiences of playing video games during the COVID-19 pandemic lockdown period, welcome to participate in our 2 minutes quick questionnaire. Let use begin!

1. Did you begin to play video games during the pandemic (new player from the end of 2019)? [single choice] *

○Yes

○No

2. How often did you play video games per week? [single choice] *

○1-2 times per week

○3-4 times per week

○5-6 times per week

○Every day

3. How many hours did you play per time? [single choice] *

○Less than 2 hours

○More than 2 hours, less than 4 hours

○More than 4 hours, less than 6 hours

○More than 6 hours

1/2

HTTPS://WWW.WJX.CN/VM/THORFDY.ASPX#

4. Did you spend more time on playing games during the pandemic period? [single choice]*

○Yes

○No

5. Did you have more consumption on gaming after the outbreak of pandemic? [single choice]*

○Yes

○No

6. Why you want to play games? [multiple choice] *

□Bored at home

□Feel relax when playing games

□Feel enjoy when playing games

□Stress or anxiety can be reduced when playing games

□Be able to keep contact with friends

□Be able to make new friends through games

□Other reasons: _______________

7. Which type of games do you prefer to play? [multiple choice] *

□Console games

□PC games

□Mobile games

□Other reasons: _______________

8. Why prefer the type of games chosen above? [completion] *

____

2/2