

A Different Game

How COVID-19 has changed the video game industry

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Abstract

The COVID-19 pandemic negatively impacted many areas of the economy; however, the video game industry enjoyed a record-breaking year. Several factors contributed to the success of video games. Mass quarantines required many individuals to stay at home. Individuals found ways to connect through social gaming and virtual platforms when they were unable to connect in person. This paper attempts to explain and visualize the drivers behind the industry's success and explore how video games satiate user needs.

Introduction

In early 2020, the World Health Organization identified SARS-CoV-2 as a new type of coronavirus. Most industries have struggled from unprecedented change in operations requirements and loss in profit due to the pandemic of COVID-19. Surprisingly, the video game industry has thrived even though the production of hardware and software faced challenges in many ways.

As an increasing share of population spends most of their time at home due to quarantine orders, video gaming has become a major entertainment and leisure tool. Demands for gaming hardware has surged in a relatively short amount of time, causing the already limited manufacture and production to face even more severe challenges. The manufacturing process has been delayed as lockdown orders penetrate the entire world. Factories were forced to shut down for health considerations. Reduced productivity, communication struggles, home responsibilities, and more have led to more struggles for the game makers. Jason Schreier at Bloomberg notes “Sony, the publisher of PlayStation consoles and dozens of video games, said in early April that it would be delaying the much-anticipated *The Last of US: Part II* from May 29 to an undetermined date.”¹ Despite the hardships that each individual faced, the industry persists with enthusiasm, understanding that more individuals and families needed gaming to enhance their lives. During the in-home isolation, people are missing social activities in the normal days and video games can fit this role to reduce loneliness as a form of leisure.

With that being said, the video gaming industry concluded 2020 with impressive performance and even significant revenue increases. Many popular games and new consoles are sold out immediately through online platforms and in-store purchases. Witkowski observes that “Video games have grown to resemble competition-based, interactive movies, and the COVID-19 pandemic has propelled the industry to make more money than movies and North American

¹ Jason Schreier, “Gaming Sales are Up, but Production is Down,” The New York Times, April 21, 2020, <https://www.nytimes.com/2020/04/21/technology/personaltech/coronavirus-video-game-production.html>.

sports combined.”² In the secondary market, resellers gained massive profit, as surging demand cannot be satisfied with the low level of production. For instance, PlayStation 5 has reached an unaffordable resale price up to \$4,500 USD, which has an MSRP of \$499 USD (disc version) and \$399 USD (digital version). Unfortunately, the spillover effect of such a large demand has resulted in unauthorized reselling and inappropriate profit making as criminals take advantages of limited quantity in new console releases. Watts has confirmed that “FOX 5 has learned of five separate armed robberies in the D.C. region involving people buying and selling a PS5.”³ The hype of gaming products have caused public safety issues. But this phenomenon is also indicating that individuals and families have an unsatisfied need of gaming during this difficult time.

As the pandemic of COVID-19 has penetrated different parts of the world continuously, many trade events and expositions for the industry have been cancelled or postponed due to bans against public gathering. Despite the struggles in gatherings, the transformation and upgrades to the video gaming industry has accelerated. In the past few months, gaming companies are relocating events to online platforms such as Twitch and YouTube to retain their earnings. These changes are in turn relatively easily accepted by consumers with high enthusiasm. They are enjoying these online innovative events, including but not limited to online game release, streaming of Esports, and virtual conferences and promotions. Stephen reveals “the live-streaming sector grew a full 45 percent between March and April; year and year, the industry is up by 99 percent.”⁴ It is gratifying to see all the positive changes in the video gaming industry from the seller side, but this project will explore more about how video games contribute to the user side.

² Wallace Witkowski, “Videos Games Are a Bigger Industry Than Movies and North American Sports Combined, Thanks to the Pandemic,” MarketWatch, Inc., December 22, 2020, <https://www.marketwatch.com/story/videogames-are-a-bigger-industry-than-sports-and-movies-combined-thanks-to-the-pandemic-11608654990>.

³ Lindsay Watts, “Armed Robberies Targeting People Buying, Selling PlayStation 5 in DC and Maryland,” FOX 5, December 7, 2020, <https://www.fox5dc.com/news/arm...-buying-selling-playstation-5-in-dc-and-maryland>.

⁴ Bijan Stephen, “The Lockdown Live-Streaming Numbers Are Out, and They’re Huge,” The Verge, LLC., May 13, 2020, <https://www.theverge.com/2020/5/13/21257227/coronavirus-streamelements-arsenalgg-tw...-numbers>.

The question about how video games impact mental health has been a long-term debate. While gaming is able to serve as an entertainment and leisure alternative to individuals, addiction has become an unsolved problem to this date. In previous studies of gaming addiction, researchers found that excessive gaming can be associated with sleep deprivation, circadian rhythm disorders, depression, aggression, and anxiety. On another hand, researchers recognized video games can fulfill social needs and maintain intergenerational relationships during the pandemic. According Lin Zhu's research on *Animal Crossing: New Horizons* by Nintendo, "[the game] captures people's instinctive to escape from realistic difficulties and their yearning to chase a peaceful and harmonious; then, it satisfies people's unwillingness to be lonely and their deep inner desire for the social interaction to get rid of the loneliness."⁵ Additionally, Nintendo has reported *New Horizons* tripled company's profits in 2020 as a record-breaking game. We have come to the realization that demand rises as people are employing video gaming as their emotional support. Properly using video games as a way of pressure relief or emotional support can be healthy and especially relieving during this special time.

In order to explain these phenomena and the complexity of the relationship between us and video gaming, I will be utilizing this project to visualize how COVID-19 has changed the gaming industry in various ways. COVID-19 has in turn helped prompt the video gaming industry to innovate, upgrade and transform itself in various way that it would otherwise take much longer to implement, but we cannot attribute the pandemic as the sole factor that changed the video gaming industry in the recent timeframe. Regardless, we are in a different game now.

⁵ Lin Zhu, "The Psychology behind Video Games during COVID-19 Pandemic," Wiley Online Library, September 9, 2020, <https://doi.org/10.1002/hbe2.221>.

Treatment

Chapter 1

Production Process Challenges

This chapter addresses the evidence of video gaming becoming the major entertainment and leisure tool during the COVID-19 pandemic. The two major sectors in the supply side of the video gaming industry, hardware manufacturing and software development, were especially difficult to function during the pandemic and were forced to adjust to the new working environment with regulations within a short amount of time. Complexity behind the changes in hardware manufacturing and software development will be discussed.

1.1 Hardware Manufacturing

The video gaming hardware manufacturing sector has been maturing throughout the past decade. In the past few years, the development of new technologies has led to revolutions in ways that video games can be enjoyed. Because we are very used to being able to purchase a new release once they are ready on the market, we tend to ignore the complexity in the development and manufacture process that goes behind this sector. As the pandemic of COVID-19 starts to hit different parts of the world, the manufacturing processes were forced to close down or even shut down, in order to abide by different local regulations for manufacturing factories.

For instance, the pandemic of COVID-19 has caused major delays in the production of gaming hardware. While the problem of manufacturing delay can usually be solved in a relatively short amount of time otherwise, manufacturing has little or no control at all during pandemic as to when to resume the manufacturing and when the quantities that were promised can be

completed. In the contrary, this is especially troublesome because the demand for gaming hardware has surged significantly as more of the population starts quarantining at home. Kids and even adults are desperately demanding video games during this time as ways to relax themselves.

Schreier remarks, “the industry has found itself dealing with more production issues than usual at the same time that people are stuck at home and clamoring for more games.”⁶ Surging market demand and production shortages combined has directly resulted in lack of overall product supply, disrupting the supply chain ecosystem. And this is not a problem that can be fixed over time, or even a few weeks. The significant delay in the manufacturing process has almost ruled all new technologies from being manufactured, not mentioning those existing technologies that were already planned in the production line. Pressman writes, “[In 2020], computer sales exceeded 302 million units, a 13% increase from the year before, and the most since 2014, according to market tracker International Data Crop.”⁷

Surprisingly, even though the manufacturing process has been delayed, the overall sales of computers as gaming hardware has hit a significant increase compared from the previous year. This in turn proves the surging demand from households for the products, even if they are not the newest release or limited edition. The supply chain also turned towards existing, and even older version of products, than trying to bridge the gap between production and demand for the newest releases. This has in turn proves that the supply chain of the gaming industry has already established its own mature system. Plan B will be up for consumer’s purchases when the Plan A is not available, which also shadows the strong demand from consumers.

Mining and processing of raw materials are essential steps in manufacturing. These processes have become increasingly difficult due to the safety regulations that local government imposes

⁶ Jason Schreier, “COVID Is Delaying All the Video Games,” Bloomberg, February 19, 2021, <https://www.bloomberg.com/news/newsletters/2021-02-19/covid-is-delaying-all-the-video-games>.

⁷ Aaron Pressman, “The Great Chip Shortage of 2021: Why Carmakers and Computermakers Are Scrambling,” Fortune, February 15, 2021, <https://fortune.com/2021/02/15/chip-shortage-2021-cars-computers-auto-industry-technology-covid-19/>.

in different areas. As Casas addresses, “The largest contributing factor to the low stock is the lack of raw materials, outsourcing, the pandemic, and the revival of the crypto craze.”⁸ Processing and manufacturing video gaming hardware is the fundamental building block of the video gaming supply chain. Having the video gaming hardware on hand or not is determinant for whether the population is able to enjoy video games. One cannot enjoy the game if they are not able to have the gaming hardware or console that supports the game.

In terms of hardware development, better picture quality has become one of the core competency of gaming hardware in the recent years. The quality of graphic cards and screen in turn determines the picture quality, and both requires extensive R&D process for both developing and manufacturing them at the optimum quality. At the moment, mainstream graphic cards that are used on gaming hardware on the market are manufactured by third-party companies, such as Nvidia and Advanced Micro Devices (AMD). The competition between major gaming companies for purchasing the rights and license has become increasingly fierce.

The production of the highest quality hardware has been fairly limited, even before the pandemic. As the supply are quickly deviating from the surging demand, more and more video game enthusiasts are forced to turn to a different market than traditional retail in order to obtain the products. Because the supply of high-quality graphic cards on the primary market has been fairly limited, the secondary market for it has been very profitable as more of the population are only able to purchase through resellers. The reselling of hardware products begins to penetrate all forms of secondary market, from ebay to StockX.

For instance, a Chicago-based data engineer, Michael Driscoll, has been tracking sales on the Internet to uncover the scope of the scalping. The table below exhibits the monetary rewards that scalpers made from Nvidia RTX 30 series graphic cards on StockX, a site best known for reselling shoes.

⁸ Alex Casas, “Getting Your Hands on Nvidia’s GeForce RTX 30 Graphics Cards Is Becoming Increasingly Difficult with Shortages Worsening through q1 of 2021,” Wccftech, February 8, 2021, <https://wccftech.com/nvidia-geforce-rtx-30-series-graphics-cards-shortages-worsening-q1-2021/>.

CPU	Total Sold	Average Sales Price	Last Week Average Price	Total Sales Volume	Estimated StockX Profits	Estimated Scalper Profits
3060 Ti	1955	\$637	\$735	\$1,256,499	\$113,085	\$325,674
3070	3697	\$794	\$812	\$2,885,006	\$259,650	\$694,002
3080	3473	\$1,302	\$1,318	\$4,408,229	\$396,740	\$1,451,614
3090	1491	\$2,008	\$1,921	\$2,987,600	\$268,884	\$394,079
Total	10616	N/A	N/A	\$11,537,334	\$1,038,360	\$2,865,370

Source: (Michael Driscoll, 2021)

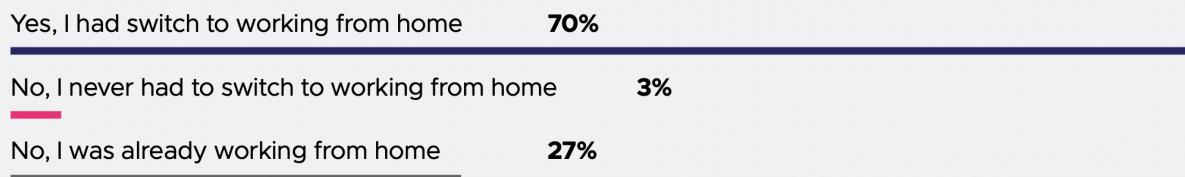
As the growth in the secondary market sales become increasingly significant, it is self-evident that the demand in graphic cards is dominant in the gaming industry, specifically in the hardware sector. The recent decrease in manufacturing and supply was unpredictable due to the sudden pandemic. However, even before the pandemic took place, the supply of gaming hardware, especially graphic cards, has not been able to meet the demand. There are many reasons behind this increasing demand from users, which will be discussed in later sections.

1.2 Software Development

Video gaming hardware supports the performance of gamers in the games, while gaming software is the fundamental aspect that ensures the joyfulness in one's video game playing process. Software development is a complementary factor in line with hardware production. In fact, as an increasing portion of the population starts working from home, the impact on software development has been far greater than that of hardware production. Tools that enable software development is crucial for facilitating communications and work productivity as work from home order continues for the vast majority of the industry population, as the industry does not have much choice due to its lack of "essential" works nature compared to healthcare. Communication struggles in turn reduces productivity, together with other home responsibilities, game makers were facing crucial struggles at the beginning of the pandemic.

The Game Developer Conference reports, "70 percent of game makers have had to switch to working from home... [and] nearly half of game makers feel working from home has lowered their productivity."⁹ The sudden change in work mode almost provided little or no time for game makers to make the initial adjustment, both physically and psychologically, regarding their work status.

Did you have to switch to working from home from a physical office at any point due to the pandemic?



⁹ "State of the Game Industry 2020: Work from Home Edition," The Game Developer Conference (GDC), July 16, 2020, https://images.reg.techweb.com/Web/UBMTechweb/%7B1a6b8923-9882-4822-9582-65cbf2342797%7D_GDC20_Report_SOTI_WFH_Edition_-_Gen.pdf.

How has your household income changed due to the pandemic?

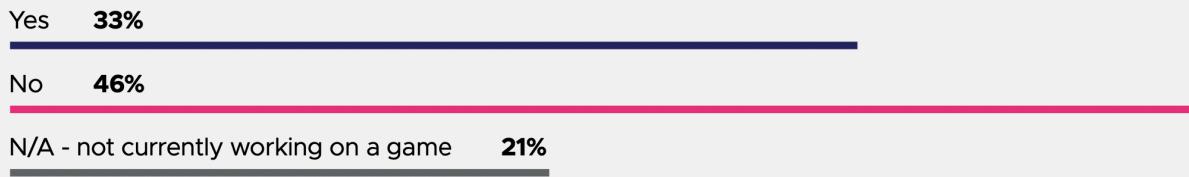


Source: (GDC, 2020)

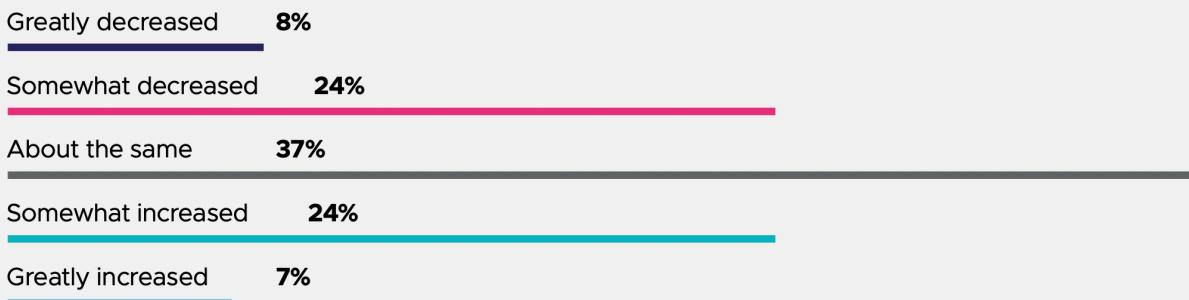
Working from home isn't just a change in work location, but also increased household tasks pressures and more time allocation for kids for those who are parents. Not only could the working environment be not so optimal for game developers, but also their salaries were facing reductions during the pandemic as companies experienced sudden reduction in revenue source, potentially leading to decreased incentive to work on the projects that they are currently assigned in. Internal household pressures and external company pressures has undoubtedly crashed developers' ability to complete their jobs in time with optimal quality.

From the survey results, about a third of the developers claimed that the overall game development process was delayed due to the pandemic. Moreover, 21% of developers are idling and are not in any game development projects at the moment. This could be due to cutting in company expenses, reducing number of employees and many other external reasons. Even though the exact reason varies and remains unknown at the moment, we cannot rule out that a reasonable number of projects were postponed or cancelled during the pandemic simply due to infeasibility.

Has your game suffered any delays due to the pandemic?



How do you feel the pandemic has affected your overall business?



Source: (GDC, 2020)

Nevertheless, it is interesting to note that “Roughly a third of [developers] have seen their business decline due to the pandemic, but nearly as many saw it increase.”¹⁰ As though the pandemic has delayed software development and hardware production in many ways, and the industry appeared to be put on hold for a while, the population has actually increased their consumption in the video gaming industry. The demand for video games has significantly increased and it has become the main form of recreation at home, as we will be discussing in the next chapter. This also encourages the population to virtually meet each other in games, increasing the necessary social interaction in one’s daily lives. The combination of increased demand and reduced supply as temporality shifted the industry away from its equilibrium, but the increase in demand is encouraging for the industry as it will slowly recover.

¹⁰ “State of the Game Industry 2020: Work from Home Edition.”

Chapter 2

Total Consumer Spending

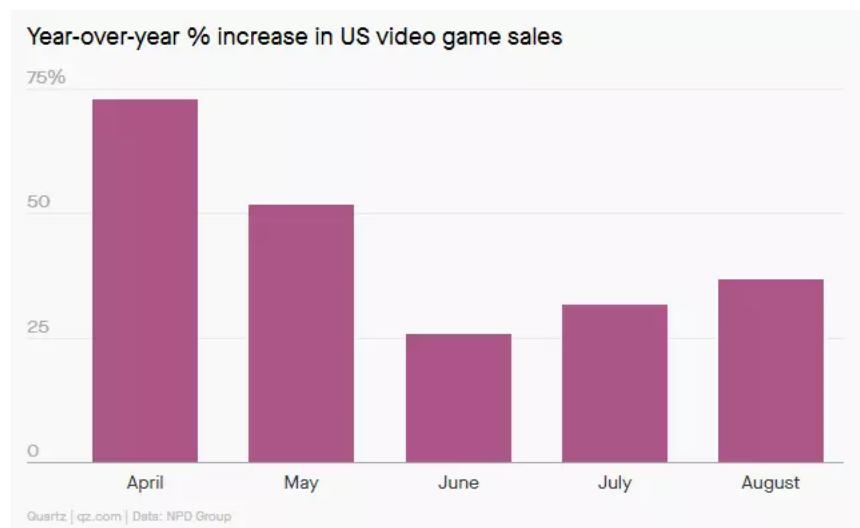
In this chapter, we will move on from the supplier side to the buyer side, from hardware manufacturing and software development to consumer behaviors. Retailers and buyer behaviors will be discussed in this chapter. Retailers have shown their preferences in online platforms instead of traditional brick and mortar store sales. But what are the factors that are determinant for stable and even growing sales during the COVID-19 pandemic?

2.1 Market Value of Gaming Retail

As discussed in the previous chapter, the pandemic of COIVD-19 has been road blocking for multiple business activities that previously needed physical contact and communication. The manufacturers are of the most suffering group in the video gaming industry simply because the factories were not allowed to open due to safety considerations. Developers have also taken their time in adjusting to a working from home environment as they adjust their ways of communication, handle household tasks and continue with their projects at the same time.

On the other hand, although gaming retail sector has also suffered briefly at the start of the pandemic, it has quickly adjusted and adapted to different online retailing methods as transformations to cope with the pandemic. The timely transformation was in turn able to capture sufficient number of sales and avoided mass disruption in distribution. Even though a large population has suffered from reduced salaries or even losing their jobs due to the pandemic, this in fact has increased the number of individuals who spend most of their time at home. While staying at home, tv shows, movies, and video gaming became the major entertainment tools that the population is heavily relying on, not only to kill time, but more importantly to relief their pressure.

The surge in the video gaming demand has been increasingly significant. According to Epstein's report in September 2020, "In the year to date, \$29.4 billion of video games have been sold in the U.S. – a 23% increase from the same period last year."¹¹ 23% increase in sales is an impressive number, especially when this is happening during a time when many of the households are in shortage of income sources and cash on hands. In order to play the games that were purchased, one is likely needed to own a video game console at home. The increase in video game sales has in turn also led to the sales of gaming consoles.



Source: (Quartz, 2020)

Epstein also mentions, "The majority of that increase has been in content (the games themselves, either bought digitally or on discs), but sales of hardware (consoles and accessories) have also seen double-digit increases since the pandemic began."¹² Compared with 2019, the total sales of game consoles gained significant growth in 2020. If we are analyzing the monthly sales, we can see that the change of sales is closely in line with the real-time status of the pandemic.

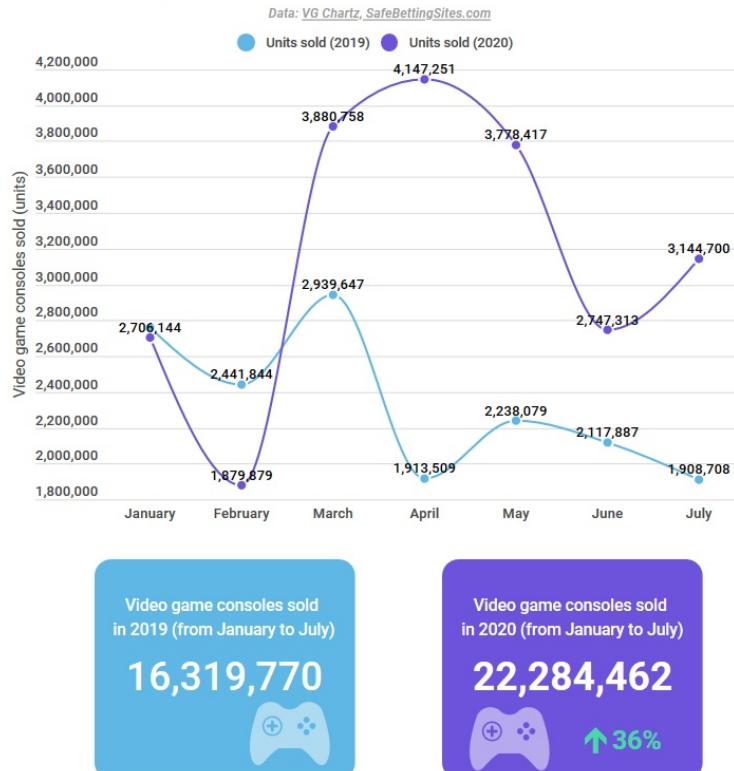
¹¹ Adam Epstein, "Game on: How COVID-19 Became the Perfect Match for Gamers," World Economic Forum, September 28, 2020, <https://www.weforum.org/agenda/2020/09/covid19-coronavirus-pandemic-video-games-entertainment-media/>.

¹² Adam Epstein, "Game on: How COVID-19 Became the Perfect Match for Gamers."

Video Game Consoles Sold Year-Over-Year

2019 vs. 2020

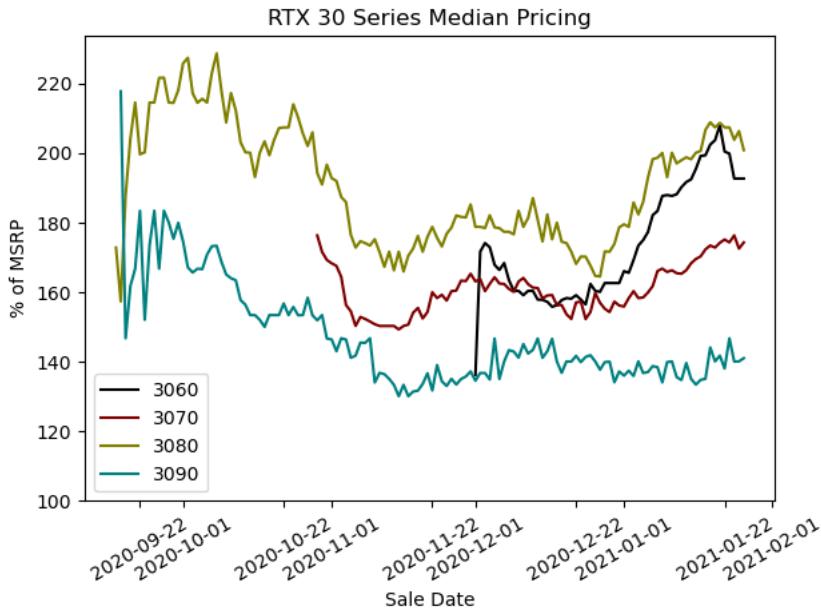
Details: Monthly total video game console units sold, arranged year-over-year. From January to July (2019 vs. 2020 comparison). Includes: Xbox One, Play Station 4, Nintendo 3DS, Nintendo Switch.



Source: (Infogram, 2020)

As the demand for gaming hardware rises, the sales of related components also start surging. For example, the selling price trend of Nvidia RTX 30 series graphics cards is affected by their inventory and the pandemic from time to time. The prices were extremely high within the first half year of pandemic, as individuals were suddenly being ordered to stay at home. Driscoll affirms, “The 3060 went from 160% launch price 1/1/21 to now 210% launch price and has recently fallen down to 190% of launch price. The 3080 is a similar story, from 170% at Christmas to now 200%.”¹³

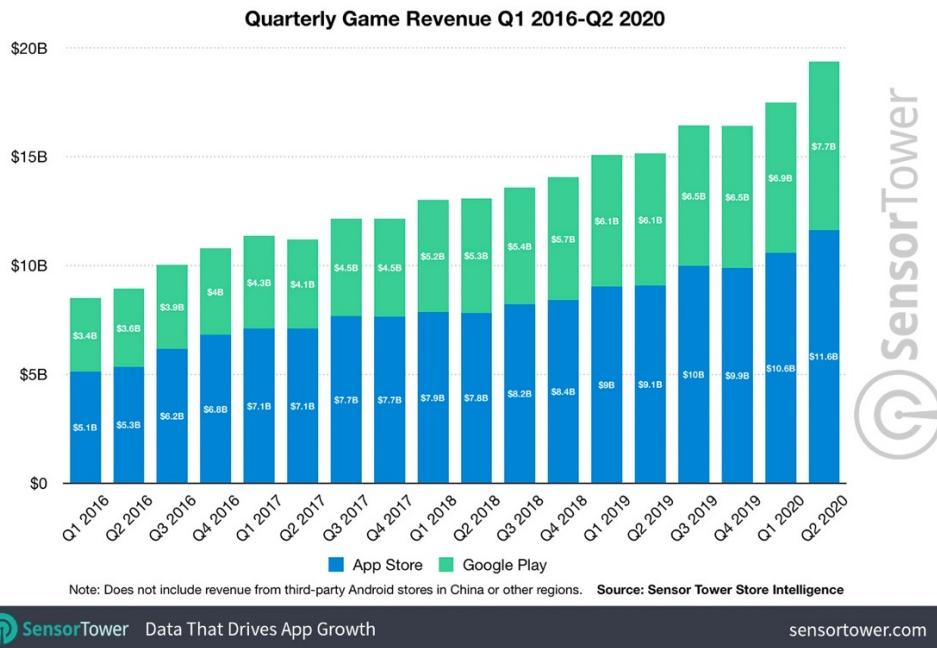
¹³ Michael Driscoll, “An Analysis of the \$62 Million RTX 30 Series Scalping Market,” DEV Community, January 26, 2021, <https://dev.to/driscoll42/nvidia-ampere-rtx-30-series-scalping-market-analysis-4gad>.



Source: (Michael Driscoll, 2021)

In addition to the increasing sales in graphic cards, the revenue of mobile games has also gained considerable growth in 2020. Bloomberg Intelligence confirms that “Mobile game net sales on iOS jumped 35.6% year-on-year in the U.S. and 44% in Japan in July, while China was flat and the EU gained just 19.5%, according to Sensor Tower.”¹⁴ In fact, mobile games have been able to bring high revenue to companies in the Asian market in recent years. In contrast, the Western market has been dominated by computer and console games for a long time, so it is hard to see mobile games being mentioned. With the rapid development of smartphones, people are gradually making them a necessity for living and socializing. As a result, more and more game companies are developing games for cell phones and profiting from them.

¹⁴ “Video Game Trends May Fragment as Virus Boost Persists into 3Q,” Bloomberg Finance, August 17, 2020, https://www.bloomberg.com/professional/blog/video-game-trends-may-fragment-as-virus-boost-persists-into-3q/?_lrsc=56964d46-c872-4c2c-bb87-1df74f8eb355&utm_source=social&utm_medium=Twitter_Elvt&utm_campaign=mktg_ElevateShare_Twitter&bbgsum=DG-TW-CORE-LI-EV.



Source: (SensorTower, 2020)

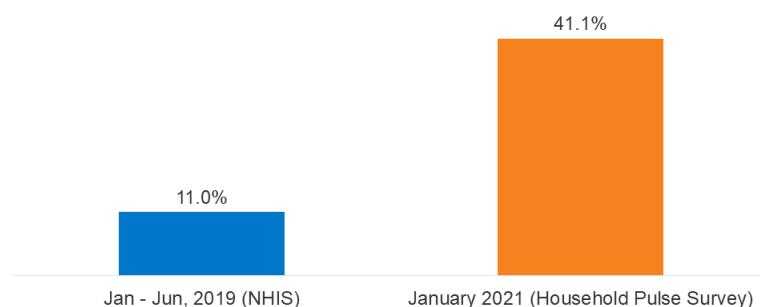
Similar to other gaming platforms, mobile games have become a mainstream form of recreation during the pandemic. Compared to computers and game consoles, smartphones have higher portability and excellent cost performance. At the same time, online stores are focusing more on in-application services and paid downloads to make profits. The popularity of games has led to a steady increase in revenue, but what makes video games beat other forms of entertainment? And which game products will become the new favorite of players? These questions will be answered in the user behavior analysis.

2.2 User Behavior

Since the pandemic has penetrated almost the entire world, more and more people had to stay at home for health and safety reasons. Initially, the population was enjoyed the otherwise never obtained freedom when they were regularly working or schooling. However, the population has quickly turned to excessive anxiety, depression, and developed extreme desire to be able to go out again and socialized. People began to turn towards different lifestyles than they would have never be able to experience when they were actively working in the office every day. According to a recent report by Kaiser Family Foundation (KFF), “During the pandemic, about 4 in 10 adults in the U.S. have reported symptoms of anxiety or depressive disorder, a share that has been largely consistent, up from one in ten adults who reported these symptoms from January to June 2019.”¹⁵ An increasing share of the population starts developing mental health disorders and have emotional unstableness. As they were seeking for an outlet to relax themselves, more and more turned towards new experiences in online socialization through video games during their time at home, reducing the feeling of feeling isolated from the rest of the society.

Figure 1

Average Share of Adults Reporting Symptoms of Anxiety Disorder and/or Depressive Disorder, January-June 2019 vs. January 2021



NOTES: Percentages are based on responses to the GAD-2 and PHQ-2 scales. Pulse findings (shown here for January 6 – 18, 2021) have been stable overall since data collection began in April 2020.
SOURCE: NHS Early Release Program and U.S. Census Bureau Household Pulse Survey. For more detail on methods, see: <https://www.cdc.gov/nchs/data/nhis/earlyrelease/ERmentalhealth-508.pdf>



Source: (KFF, 2021)

¹⁵ Nirmita Panchal, Rabah Kamal, Cynthia Cox, and Rachel Garfield, “The Implications of COVID-19 for Mental Health and Substance Use,” Kaiser Family Foundation (KFF), February 10, 2021, <https://www.kff.org/coronavirus-covid-19/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/>.

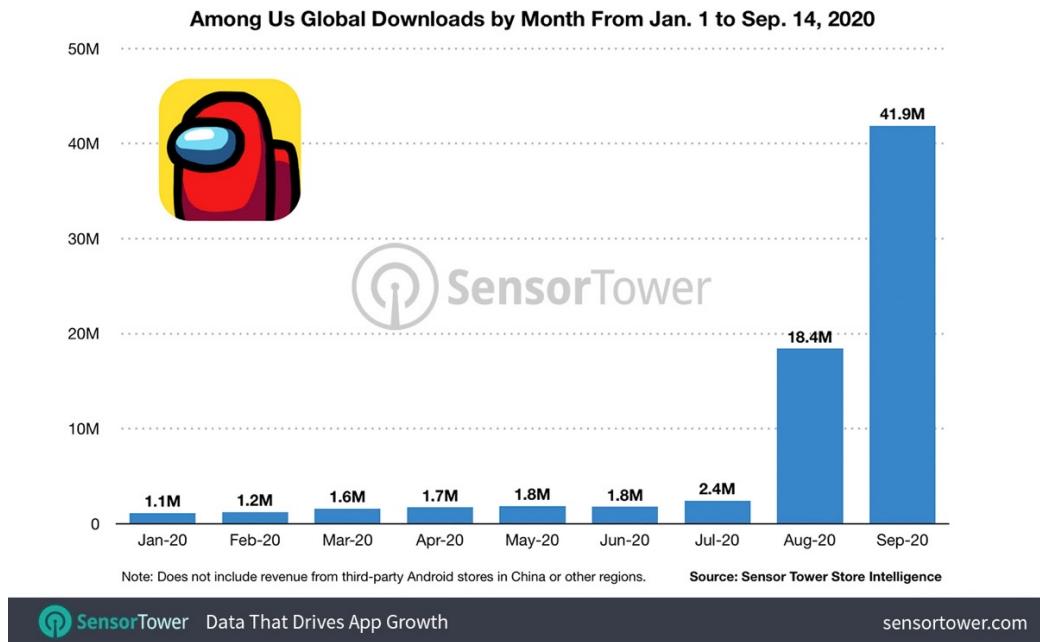
On the other hand, previous studies have shown that excessive gaming can in turn lead to unhealthy lifestyle and even possibly mental health related disorders. We cannot deny that excessive gaming may lead to sleep deprivation, circadian rhythm disorders, depression, aggression, and anxiety. On the more extreme side, video games that involve violent setting, for instance those shooting games, can lead individuals, especially teenagers, to develop an inappropriate understanding of violence, and may increase their chance of being involved in violence in the real-life settings.

However, as the time staying at home begins to aggregate, the effects of video games has been otherwise for the vast majority of the population who choose to turn to video gaming as their outlet for leisure time. Of all games, those simulation games that involved multiplayer online experiences have gained the most popularity. Lufkin believes that “The explosive growth of gaming during the pandemic has shown that many have found a new outlet for much-needed connection in isolation.”¹⁶ Instead of meeting and socializing in person, people have found that connecting to each other in the online environment has been especially comforting and relaxing.

There were many games that rose to extreme popularity for this purpose. For instance, *Among Us* is an online multiplayer social deduction game that was released on Android platform in 2018. After this, the multiplayer real-time social experience of this game has led it to gain increasing attention in 2020. Individuals have enjoyed the real time connection with other users in the game, especially during the staying at home environment when they are unable to socialize with their friends and families in person. As of November 2020, *Among US* has garnered 100 million online downloads, which marks an incredible milestone and the changes in the Western mobile game market during the pandemic. Before the pandemic, the concerns regarding video games’ effects on mental health were a major concern. Contrary to this

¹⁶ Bryan Lufkin, “How Online Gaming Has Become a Social Lifeline,” BBC, December 16, 2020, <https://www.bbc.com/worklife/article/20201215-how-online-gaming-has-become-a-social-lifeline>.

situation, at this moment, people are gradually forgetting the stereotypes of video games leading to mental disorders and largely accepting and welcoming the pleasure that video game brings to them.



Source: (SensorTower, 2020)

Mobile games that allow real-time connection with other users for multiplayer environment are not the only type of game that gained extreme popularity during the pandemic. As we turn our attention to console games, we find the same trend applies as well. For instance, *Animal Crossing: New Horizon* has been a huge success. The game is based on the gaming hardware of Switch, a Nintendo owned license device. The game has gained unexpected attention from the public and allowed more of the population to rethink the psychology behind the game.

Base on the previous *Animal Crossing* series, *New Horizon* has expanded nonlinear life simulation experience played in real-time. In the game, a player can take the role of a personalized imaginative character who moves to a deserted island to build and expand a new home and owning new spaces by granting a loan, exploring the surroundings, interacting with other villagers, collecting different creatures, being a fashion designer, participating in-game

events, and much more. The game has shadowed many aspects of real life that individuals were experiencing when they were not forced to be quarantining at home. As an open-ended game, *New Horizon* also allows players to have online social interaction with other friends to visit and help them, which is one of the most attractive parts of the game. Individuals who are not able to meet each other in person in the real life now has an alternative way of meeting and greeting families and friends through the game. *New Horizons* have gained huge attention and its revenue has surged exponentially as demands rise since its release. SuperData confirms that the game sold five million digital copies worldwide in March 2020, which is setting a new console game sales record in history.¹⁷ Shortly after the game's release, the Nintendo Switch has been sold out almost everywhere online and in-store at major retailers. The complementary use of gaming hardware and development of gaming software inevitably shows that the success of each almost must certainly depend on another.

However, the media and critics has not left all comments with positivity for this phenomenon. Indeed, many critics attribute the popularity of *New Horizon* to the “right timing”, such that if the game were release at another time when people are not forced to stay at home, the success and relatability of the game will not bring the same level of success as it had been when it was during the pandemic. Khan points out the success has been partially attributed to its release during the COVID-19 pandemic, with players seeking a sense of escapism in their self-quarantine at home.¹⁸ In other words, we can see the whole game world as the “La-la land”, a kind of escape that is conjured up by people while the whole world in the grip of the pandemic. Zhu describes, “[The game] captures people's instinctive to escape from realistic difficulties and their yearning to chase a peaceful and harmonious life; then, it satisfies people's unwillingness to be lonely and their deep inner desire for the social interaction to get rid of the loneliness.”¹⁹ Video games has been playing an unexpected, but crucial role for comforting individuals during the difficult time at home and enabled alternative ways for connecting with families and friends

¹⁷ “Worldwide Digital Games Market: March 2020,” SuperData, April 22, 2020, <https://web.archive.org/web/20200422233926/https://www.superdataresearch.com/blog/worldwide-digital-games-market/>.

¹⁸ Imad Khan, “Why Animal Crossing Is the Game for the Coronavirus Moment,” The New York Times, April 7, 2020, <https://www.nytimes.com/2020/04/07/arts/animal-crossing-covid-coronavirus-popularity-millennials.html>.

¹⁹ Lin Zhu, “The Psychology behind Video Games during COVID-19 Pandemic.”

when in person meetings are not allowed. The struggle of feeling isolated, the anxiety of not being able to go out, and the depression from excessive household tasks all seemed to be relieved when the individual turns towards video gaming as ways of relief and enjoyment.

From the above analysis, we can conclude that social interaction is a key highlight that leads to the successfulness of the game, which in turn relieves individuals' psychological pressures of possible feelings of loneliness and isolation. The game creates a utopia for the players to create their own space according to their wishes, visiting their friends who are also in the game, as well as interacting with each other in their desired way. This is the most impressive aspect of video games during the pandemic: players can socialize virtually even they are in physical isolation for an extended period of time. As the time for staying at home order extends, individuals' physical and mental health status faces more risks, especially for those who struggle from adjusting to another lifestyle than they have been living habitually for many of the past years. Sue Edwards has claimed in her analysis, "loneliness and social isolation are as damaging to health as smoking 15 cigarettes a day and worse than well-known risk factors as obesity or lack of physical activity."²⁰ An increasing share of the population experiences, but do not realize the changes in their mentality when they are forced to stay at home for an extended period of time.

Furthermore, the benefits of playing online games with others were highlighted in research by Cole and Griffiths. They found that 75% of the participants made appropriate pals due to taking part in online games and 30% met a romantic associate via a game.²¹ And Coyle notes, "These friendships are often of a high quality, with over one in three people stating that they talk to their online friends about problems that they would not talk to their offline friends about."²² Moreover, *New Horizon* was promoted by some third-party platforms like Nookazon – a

²⁰ Sue Edwards, "All the Lonely People," ProQuest, November 2013, <https://search.proquest.com/openview/93ae6e431ac9339d791381c7a9e77f47/1?pq-origsite=gscholar&cbl=45202>.

²¹ Helena Cole and Mark Griffiths, "Social Interactions in Massively Multiplayer Online Role-Playing Gamers," in *CyberPsychology & Behavior* (Mary Ann Liebert, 2007), 575-583.

²² Natalie Coyle, "The Psychology of Animal Crossing," Psychology and Video Games, April 9, 2020, <http://platinumparagon.info/psychology-of-animal-crossing/#Social>.

website that allows players to sell their in-game items. The founder Daniel Luu says one of his site's most popular sellers is 50-year-old women who has never played video games in her entire life. *New Horizons* can fulfill people's desire to continue their social lives with others virtually during the pandemic and further providing an informal mental break.

Ultimately, video games not only were outlets for pressure relief during the pandemic, but also enabled people to connect with each other during the special time of pandemic. Even though individuals were forced to stay at home, meaningful friendships and connections can be made online in real-time as the technology enables more individuals to connect to one another. Even though there were previous concerns regarding excessive gaming on the healthiness of individuals both physically and mentally, video gaming has almost temporarily ruled out all of these concerns during the pandemic, as it has acted a crucial role for individuals to relax and connect.

Chapter 3

Time to Shift

As many countries have imposed restrictions on travel, all offline public events in the video game industry have been affected. As a result, the companies have begun to use live streaming services to make it possible for people to attend these events as scheduled. Through this change, people are able to participate in different events without having to travel long distances. At the same time, more companies are seeing the added profits that live streaming services bring to the video game industry.

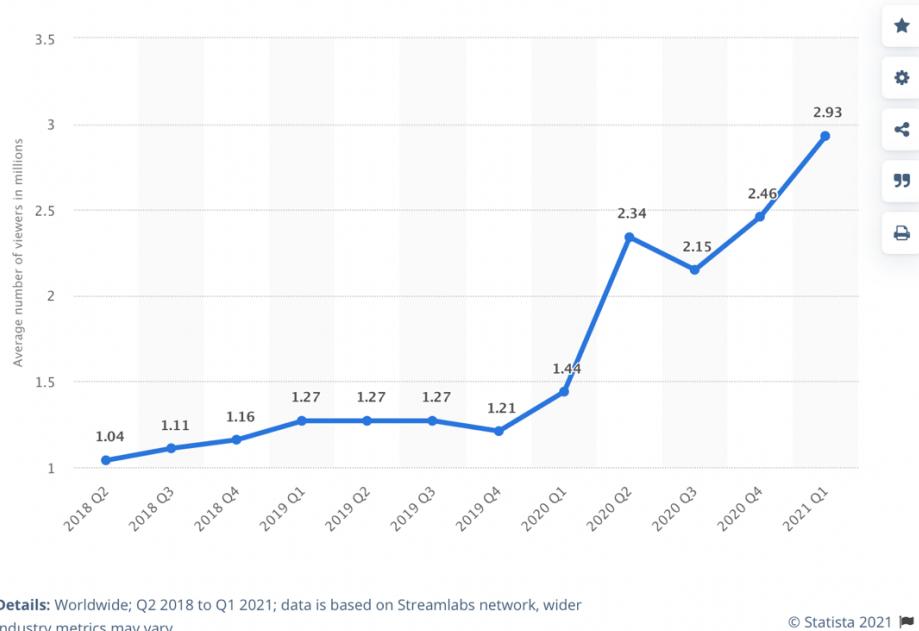
3.1 Cancelled or Affected Industry Events

During the COVID-19 pandemic, many trade events and expositions for the video game industry have been cancelled or postponed due to bans against public gatherings. The largest trade event E3 2020 was ultimately cancelled by March 2020 by the Entertainment Software Association (ESA) after several weeks of doubt. Later, on March 11, 2020, the ESA affirmed that they cancelled the physical E3 show amid the fears of the outbreak as they were looking to arrange for virtual presentations from its exhibitors. Unfortunately, by April 2020, the ESA determined that the logistics of arranging a virtual event was too difficult due to disruptions from the pandemic, fully cancelling the show in 2020, but with plans in place to return in 2021.

Unlike the production process challenges that I mentioned earlier, many events can still be held as scheduled with the support of live streaming services. For example, various conferences and events including the Game Developers Conference (GDC), 16th British Academy Games Awards, Tokyo Game Show, and Gaming Community Expo are moved online. Undeniably, people's love, passion, and demand for video games has led to related events being taken online more quickly. On the one hand, the companies can avoid security problems associated with gatherings in public places and save a lot of costs for the events. On the other hand, exhibitors and players can attend these events from anywhere in the world.

Besides conferences and expositions, esports is the third part that impacted by the COVID-19 pandemic deeply. As Tobias Seck explains, “While the esports industry is often perceived as a natively online ecosystem, especially the professional competitive esports scene has shifted to offline over the last few years. Consequently, esports organizations, tournament and league organizers, media, and sponsors had to adapt in a very short period of time when COVID-19 policies heavily restricted such events.”²³ However, people will still follow and participate in different tournaments through the online platforms.

In the plot of the total hours watched on Twitch worldwide, it has a significant increment between Q1 and Q2 2020 which is coinciding with the outbreak of the COVID-19 pandemic. This set of numbers proves that Twitch’s active user base is enough for major gaming companies to choose them for their online events.



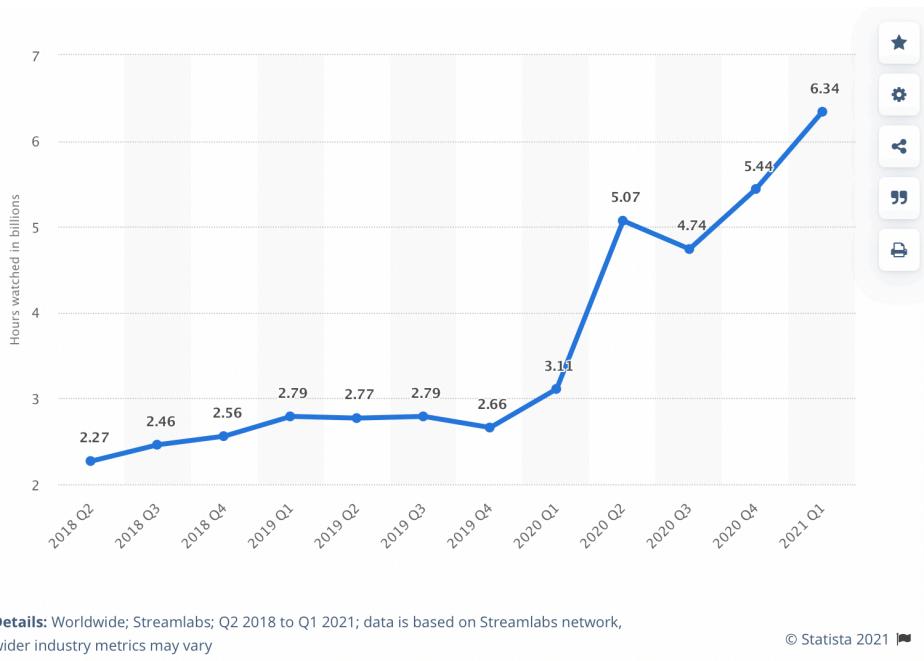
Source: (Statista, 2020)

²³ Tobias Seck, “How COVID-19 Changed the Esports Industry in 2020,” The Esports Observer, December 23, 2020, <https://esportsobserver.com/covid-19-finance-2020/>.

Similar to the gaming experience, the live streaming services broke the constraints of time and geography to allow people to reunite in the virtual world. It not only kept people safe but also helped everyone feel less bored during the quarantine. While the trend is to take all events online during the pandemic, the convenience and mental relaxation that live streaming services provided is also evident to all.

3.2 Live Streaming Service

In addition to helping to run successful online events, the live streaming services also made streamers to earn more money during the self-isolation. David Segal reports, “Viewership numbers on Twitch leapt 31 percent from March 8 to March 22... During that two-week span, the numbers of hours a day watched on Twitch rose to 43 million from 33 million.” He also mentions, “Over the summer [2019], Tyler Blevins, who plays under the name Ninja and widely considered one of the best Fortnite players in the world, left Twitch for Mixer in a multiyear deal reportedly worth as much as \$30 million.”²⁴



Source: (Statista, 2020)

The live streaming services have been growing steadily in recent years, and the pandemic has given more people a renewed awareness and opportunity to use these services. While providing entertainment to the public, people are becoming aware of the potential value and want to be a part of it.

²⁴ David Segal, “Is This the Most Virus-Proof Job in the World?” The New York Times, April 7, 2020, <https://www.nytimes.com/article/coronavirus-video-game-streaming.html>.

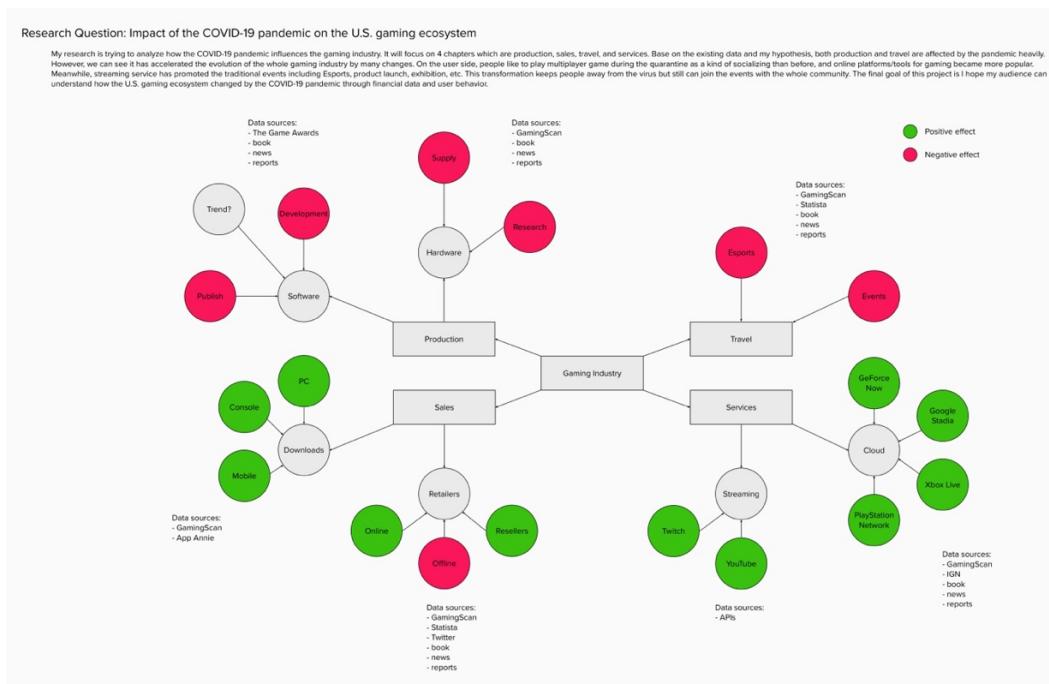
Chapter 4

Visualization Project

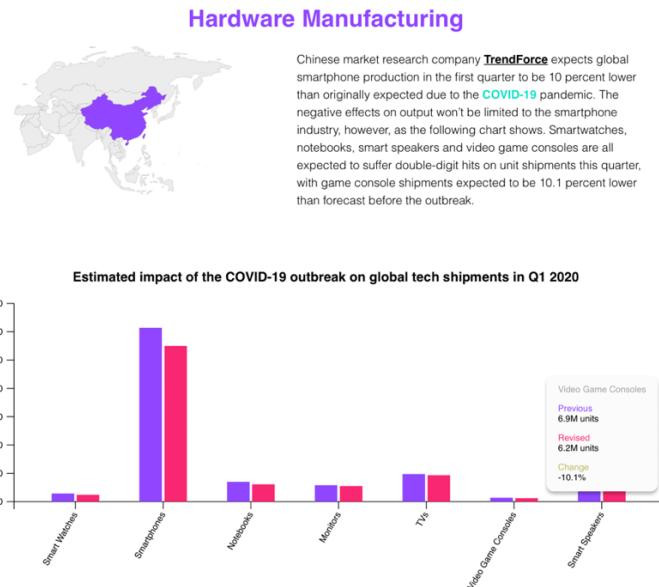
The COVID-19 pandemic has had a tremendous impact on both humans and industries around the world. Much like the way our lives have changed to fit health protocol, industry practices have shifted radically. The video game industry is no stranger to this disruption. My project analyzes the social and economic factors of the video game complex and how they have been impacted by a global pandemic.

4.1 Data and Methodology

The COVID-19 pandemic has had a tremendous impact on both humans and industries around the world. Much like the way our lives have changed to fit health protocol, industry practices have shifted radically. So, there is a question: is game over? Actually, the video game industry is no stranger to this disruption. My project analyzes the social and economic factors of the video game complex and how they have been impacted by a global pandemic.

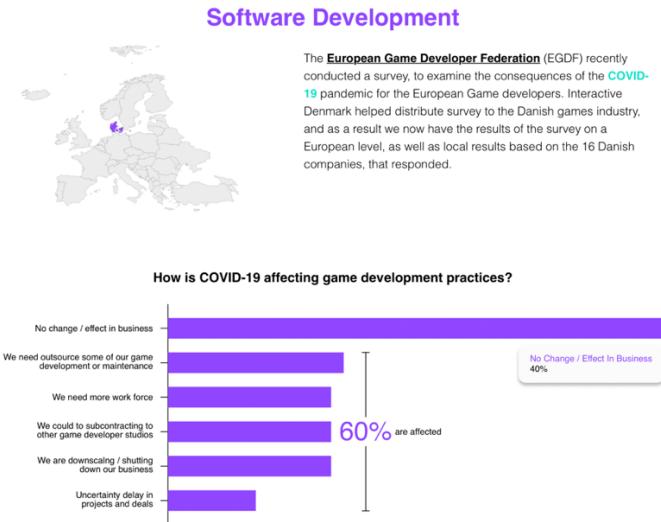


The original plan for data collection supposed to be divided by four parts: production, sales, travel, and related services. The production process challenges can easily reflect how the gaming hardware manufacturing and software development were impacted by the COVID-19 pandemic. The Chinese company TrendForce which focused on market intelligence and professional consultation services has estimated the impact of the COVID-19 pandemic on global tech shipments in the first quarter of 2020. The plot shows COVID-19 will cause a negative growth on the total shipment for all tech devices. Many suppliers cannot deliver their products on time because the manufacturing processes were forced to slow down or even shut down, in order to abide by different local regulations for manufacturing factories.



If we look at the game development practices in Denmark, even though 40% of developers said they had no change or effect during the project development, we can see 60% complained about their difficulties that led to a delay on work when they are forced to work from home. As estimated 1/3 of developers surveyed in 2020 by the Game Developers Conference (GDC)

stated that COVID-19 caused a delay of the games they were working on, a combination of the pandemic and the remote working conditions.²⁵



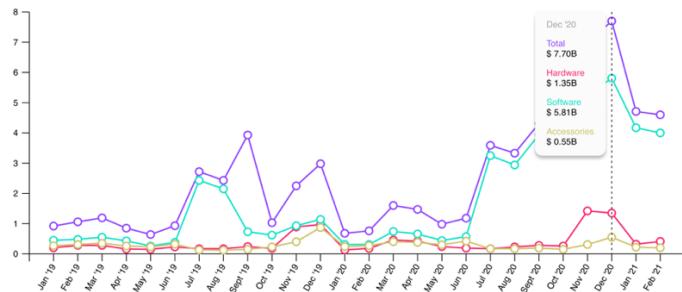
On March 13, 2020, President Trump declared a national emergency due to the rapid spread of the coronavirus disease. When public places closed their doors, many people turned to home entertainment during periods of self-isolation. As a result, the total revenue of the U.S. video game industry increased significantly, especially during the holiday season when compared to last year. In general, the video game industry has its most important months in November and December as video game hardware and software make very popular Christmas gifts. In December 2020, total video game sales surpassed 7.7 billion U.S. dollars in the United States.

²⁵ "State of the Game Industry 2020: Work from Home Edition."



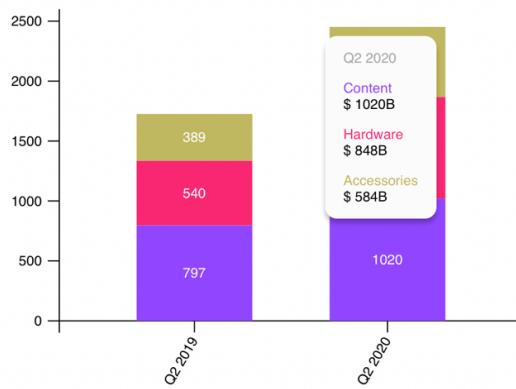
One year ago, the [Centers for Disease Control](#) (CDC) identified the first case of [COVID-19](#) in the U.S., and the pandemic continues to cause significant risk to the public health and safety of the Nation. On March 13, 2020, President Trump has declared the national emergency by the rapid spread of coronavirus disease. While cinemas and theaters closed their doors to try to stem the spread of the disease, many people turned to home entertainment during periods of self-isolation. The [NPD Group](#) reported that video game sales in North America in March 2020 were up 34% from those in March 2019.

Monthly revenue of the U.S. video game industry 2019-2021



The consumer spending on video games in the U.S. also grew in Q2 2020 compared to the same time in 2019, and the gaming content became the key contributor. The statistic contains data on how much money U.S. consumers spent on video and computer game hardware, software and accessories in the second quarters of 2019 and 2020. In the second quarter of 2020, consumers in the United States spent an estimated 1.02 billion U.S. dollars on video gaming content and a record 11.6 billion U.S. dollars on video gaming as a whole.

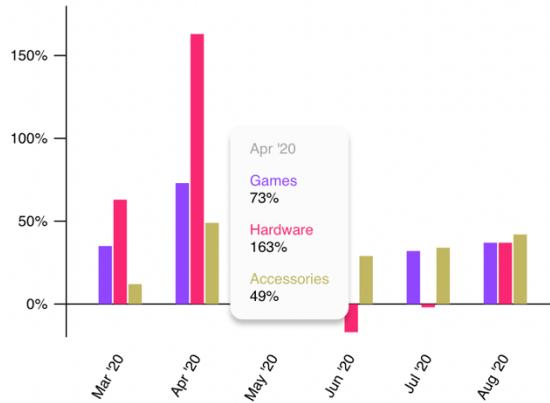
Consumer spending on gaming in the United States in 2nd quarter 2019 and 2nd quarter 2020



The COVID-19 pandemic that spread across the world at the beginning of 2020 was not only a big threat to public health, but also to the entire entertainment industry. April 2020 (about one

month after the national emergency has been declared), during the height of the lockdown, sales of video gaming hardware in the United States increased by 163 percent compared to the previous year.

Growth of consumer spending on video games in the United States from March to August 2020



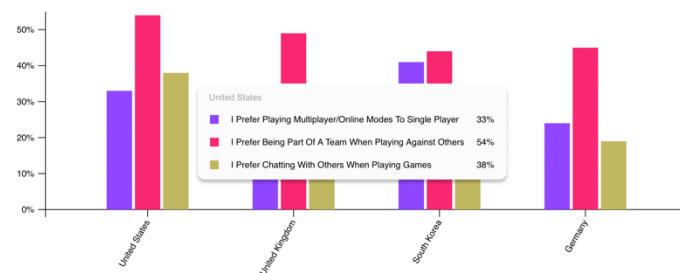
In this age of social distancing and mental-health strains, gamers have long had a tool that is now bringing some relief to those who have never picked up a controller before. The explosive growth of gaming during the pandemic has shown that many have found a new outlet for much-needed connection in isolation. In the survey of new mobile gamers in selected countries who are open to gaming as a social activity, most of them prefer being part of a team when playing against others or chatting with others. At this moment, the social function of video games has been highlighted.

Gaming As a Social Activity



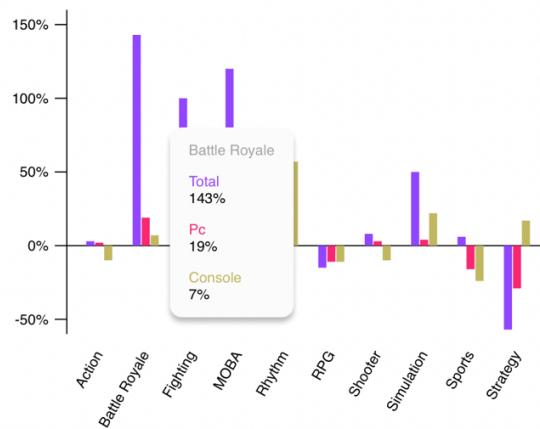
In July 2020, 54 percent of new gamers from the United States who took up gaming during the **COVID-19** pandemic reported that they preferred being part of a team when playing against others. Overall, 49 percent of gamers from the UK and 44 percent from South Korea reported the same.

Share of new mobile gamers in selected countries who are open to gaming as a social activity as of July 2020



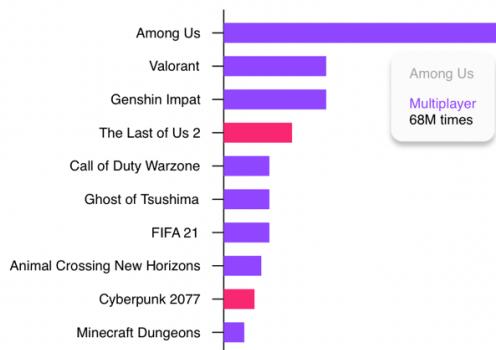
As a result of the COVID-19 pandemic in 2020, many people turned to video gaming as a form of entertainment during long periods of being locked down at home. During a survey in the United States in June 2020, respondents stated that their time spent playing battle royale games had increased by 143 percent. PC gamers stated that their time spent playing fighting games had increased by 24 percent. Console gamers stated that their time spent playing rhythm games had increased by 57 percent. Also, the simulation game like Animal Crossing which provides a virtual world over the cloud that allows people to escape from the cruel reality has received the attention from players as well.

Increase in time spent video gaming during the COVID-19 pandemic in the United States



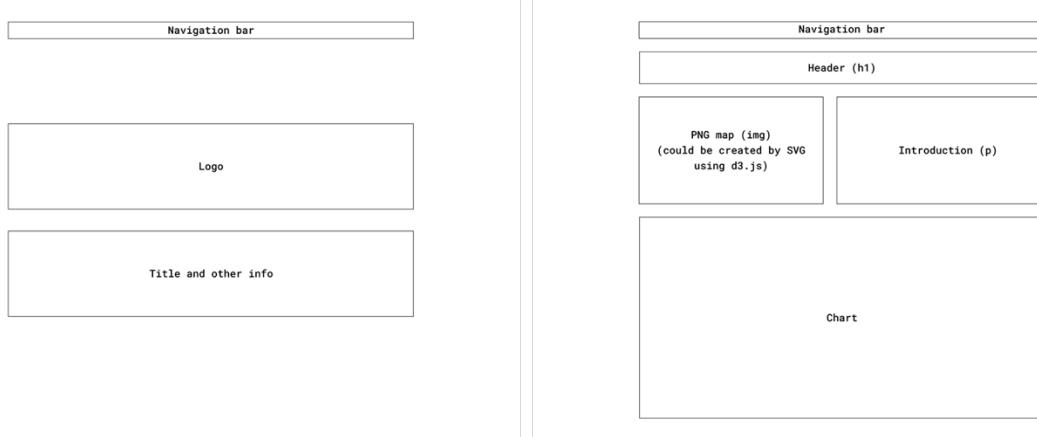
And another proof is in the top ten game titles that were searched by people in 2020, 80% of them were multiplayer games. The video game that was most searched for worldwide during 2020 was Among Us, an online game available on PC and mobile developed by InnerSloth. The social deduction game peaked at 68 million monthly searches.

Most searched video games worldwide in 2020



4.2 Storytelling and Design Decisions

In this project, the visualizations present how regular production process, total consumer spending, user behavior and gaming community network are impacted by the COVID-19 pandemic. The wireframe design was inspired by the news article style and the layout adhered to human reading habits.



Both the theme color and project logo design referenced one of the most successful live streaming services: Twitch. The color palette brings a relaxed atmosphere and can be freely adapted to light and dark modes. It is worth mentioning that the logo design was also inspired by Twitch. The chart bubble means this project will lead a discussion about the video game industry and asks a question: is game over?



A Different Game

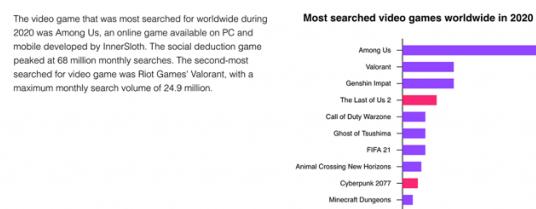
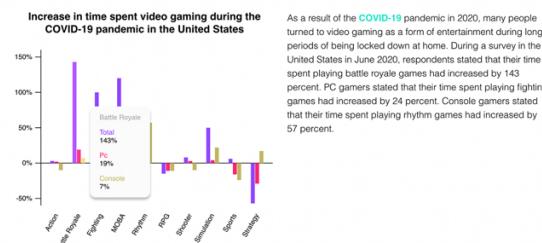
HOW COVID-19 HAS CHANGED THE VIDEO GAME INDUSTRY.

By Yujun Jiang

The map in each section will highlight a matched country or region base on the dataset. It will help the audience to understand what is happening in the video game industry around the world visually. Compete to text, I believe could be more readable, understandable, and eye-catching, especially for young people.



In each chart, the color palette has created a visual system that contains some information including ‘platform’, ‘device’, and ‘category’ from the dataset. Meanwhile, toolstrips save a lot of space compares to legends and people would like to explore how to interactive with the charts by themselves.



Conclusion

The video game industry has undergone a series of changes as a result of the COVID-19 pandemic. Stress on the supply chains of hardware and software have forced companies to adjust to new working environments within short periods of time. At the same time, people have turned more and more towards games as a form of leisure, entertainment, and human connection. This project analyze several economic and human studies data sets collected during the past 2 years in order to visualize the supply, demand, and popularity of games during the pandemic. The results suggest that despite turbulence in the supply chain, game companies have managed to adequately shift their business models to allow for tremendous growth as other industries have struggled.

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