

# Twitch Popularity Turned Profitability

An analysis of popularity of game genres on Twitch boards and their indications for game developer profitability

*University of Southern California*

## Abstract

This paper explores the relationship between Twitch's specific video game categories and the popularity of each category. This relationship relies on the assumption that Twitch popularity indicates profitability for a game. With this in mind, the paper provides insights to video game developers on directions for future game production as well as marketing strategies. The relationship between game categories and Twitch popularity is investigated using key qualitative (e.g. game genre, game title etc.) and quantitative (e.g. average total views per category, average total watch time per category, etc.) variables from Twitch API datasets on SullyGnome (SullyGnome, 2021) that can be used to define popularity. Through the use of an analysis of variance, linear regressions, and data visualisations of trends, the null hypothesis was rejected.

***Ha.*** *There is a positive relationship between First-Person Shooter(FPS)/Shooter games and watch time and viewer count.*

***Ho.*** *There is no relationship between First-Person Shooter(FPS)/Shooter games and watch time and viewer count.*

The paper finds evidence that FPS games do result in higher view counts and watch time than other game genres; ultimately, suggesting that the FPS genre does lend itself to higher sales revenue for the game developers.

## Introduction:

As Twitch has seen rapid growth in recent years, becoming the most popular live-streaming platform in the world, online gaming and streaming has become a lucrative business both for game developers and content creators. Twitch has provided a foundation for game developers to diversify their audience since there is increasing passive involvement and viewership in the gaming community from people watching others play video games online (N & E, 2017). The gaming industry, however, is highly competitive as countless new games and titles are being released with most not finding success. Therefore, there is increasing pressure on game developers to produce games that will be successful with major industry players like Twitch and, therefore, be profitable.

This paper looks to provide insight on if aiming for popularity on Twitch can be financially beneficial for the game development industry. This paper will explore the following: the method and findings of multilinear regression, a temporal analysis of Twitch metrics, data visualization and findings of regional sales, and finally the conclusion and implications of the findings.

## Methodology and Analysis of Linear Regression

On Twitch, there are hundreds of channels that feature playing games spanning a vast array of different video game genres. In order to determine and compare which variables would show the popularity of each genre, this paper focused on two variables - stream time and watch time, to run a linear regression analysis for the top genres represented on Twitch. Using the SullyGnome dataset, the data was augmented to include genre of game and was then grouped by genre. Accordingly, an analysis of the relationship between the e total stream time to total watch time for all the channels under that genre category was conducted as this relationship would be an indication of popularity of a genre. A higher number of viewers per stream will increase this ratio and indicate to us that a game developer might want to focus on

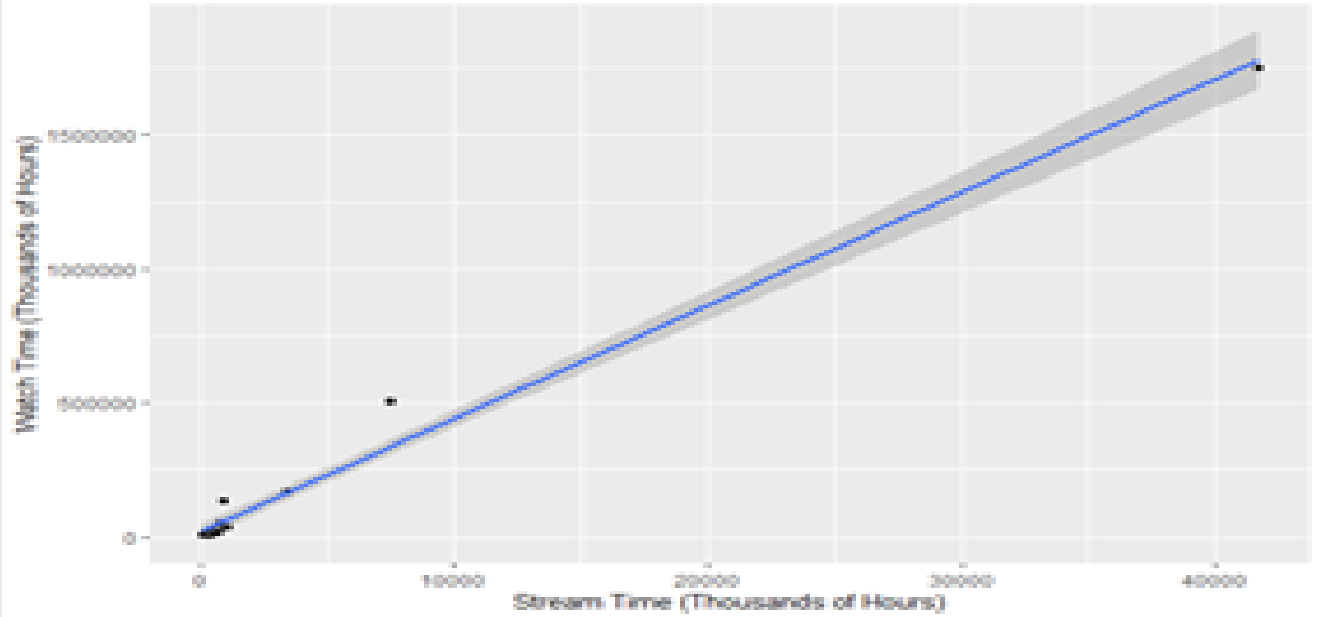
those types of games as there would be a likelihood of higher Twitch watch time and consequently earning potential for the developer and the development company.

From the top 200 game channels of 2021 on Twitch, only video game related channels were investigated; the data were grouped and assigned names based on genre, and then finalized with the top five genres by game count. These genres are Shooter, Action, Action / Adventure, Strategy, and RPG. In addition, the analysis used thousands of hours as the unit of measure for watch time to make the data more manageable. The summarized results of running a linear regression model with stream time as the independent variable and watch time as the dependent variable are indicated below:

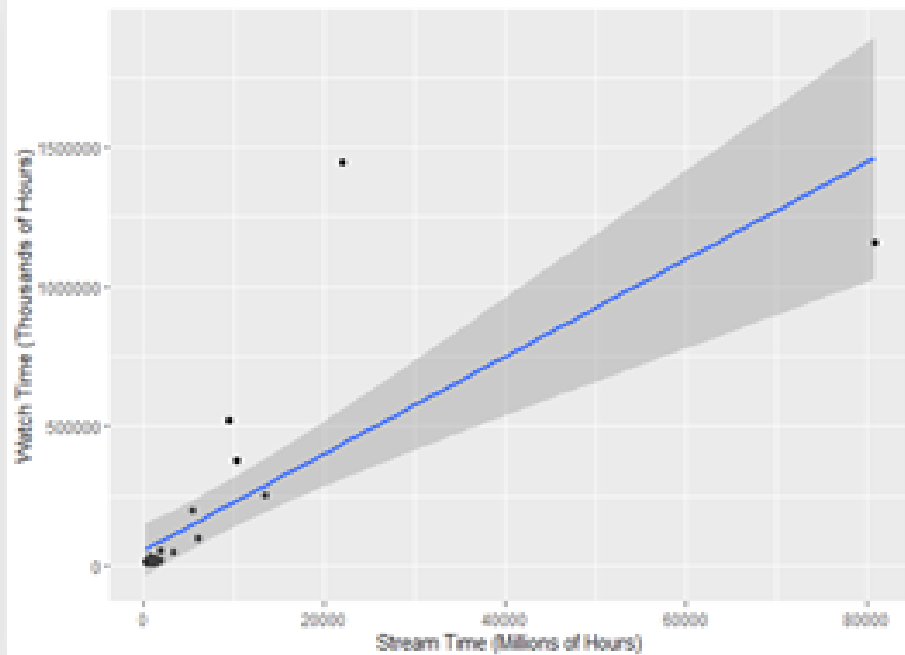
<b>Game Genre</b>	<b>Intercept</b>	<b>Slope</b>
<i><b>Shooter</b></i>	8,928.225	15.99673
<i><b>Action</b></i>	54,686.039	17.39546
<i><b>Action / Adventure</b></i>	-2,834.767	26.43357
<i><b>Strategy</b></i>	20,097.143	42.22071
<i><b>RPG</b></i>	-12,137.248	51.57835

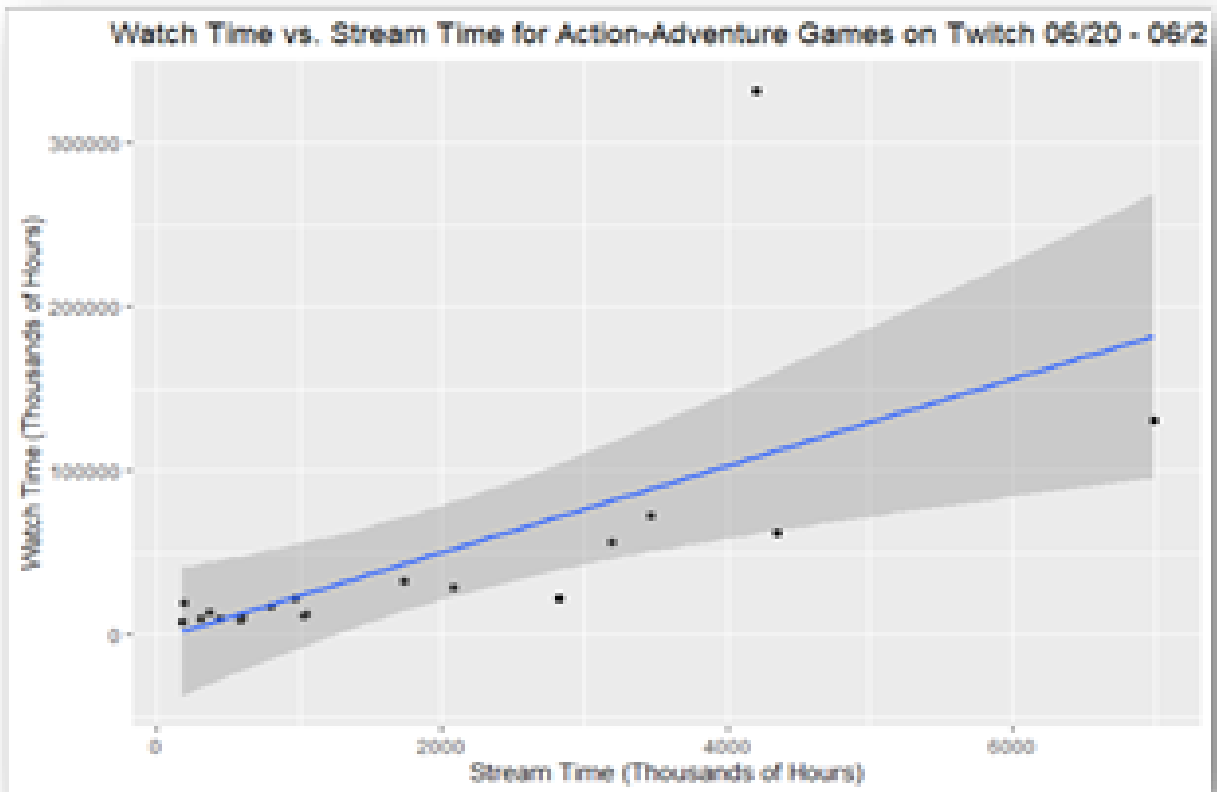
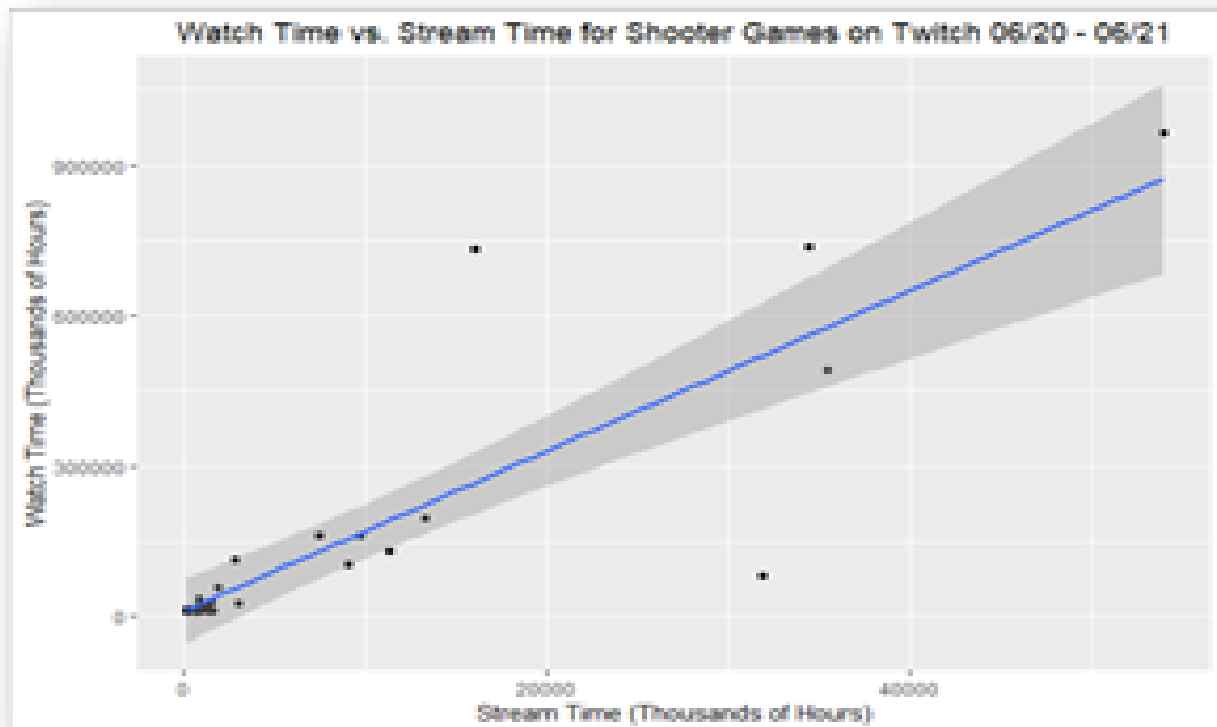
Presented below are the corresponding scatter plots for each of the five genres. Each plot shows the estimated line of best fit with a 95% confidence interval band (light grey).

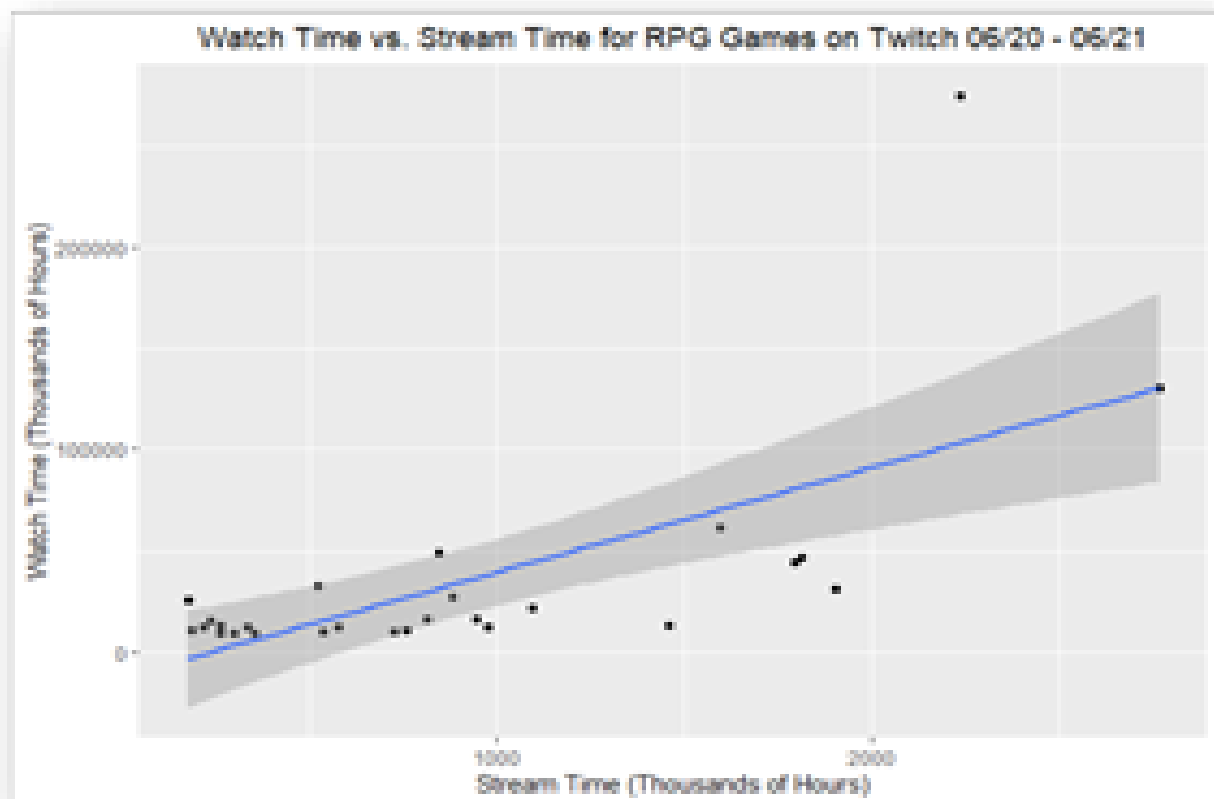
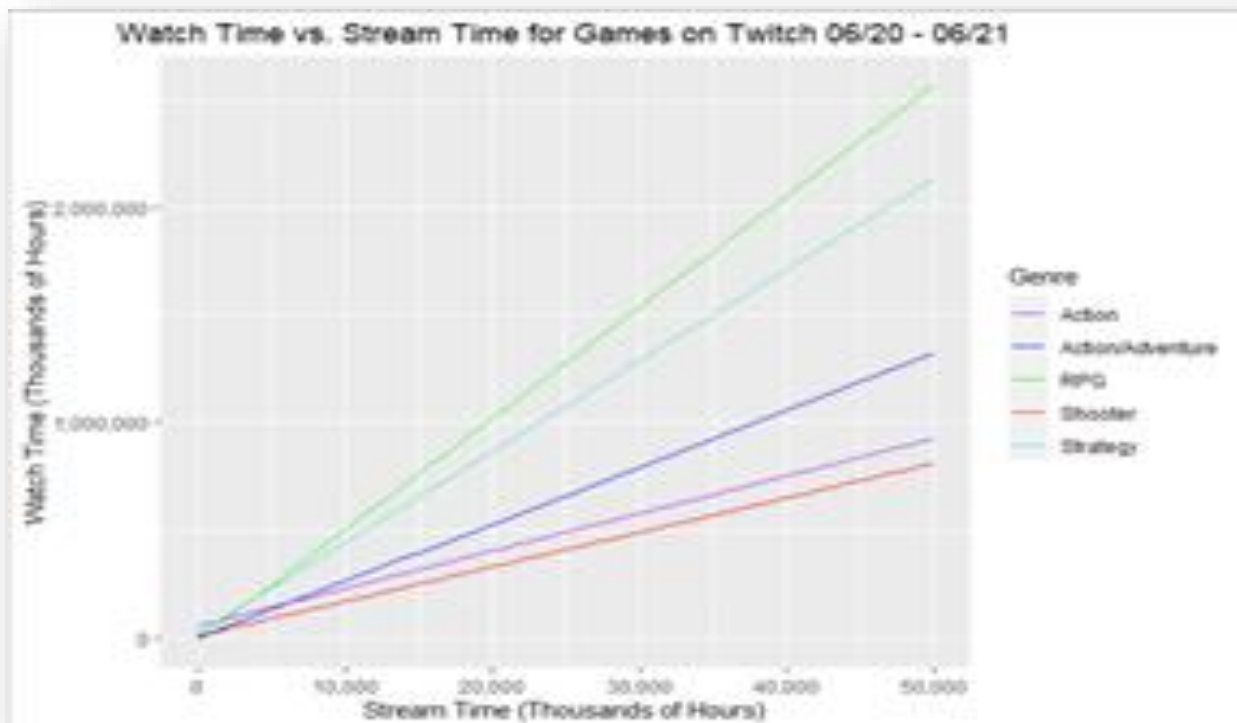
Watch Time vs. Stream Time for Strategy Games on Twitch 06/20 - 06/21



Watch Time vs. Stream Time for Action Games on Twitch 06/20 - 06/21







The results of this analysis show that overall RPG type games had the highest marginal increase in watch time per stream time is the greatest among the five genres, whereas shooter games had the lowest marginal increase in watch time per increase in stream time. This could indicate that on average it would be beneficial for a new game developer to create games from this genre to gain the most following from viewers on Twitch. An interesting finding from the plots is that there are some games that are significantly above the trendline or have much higher stream and watch time than a cluster of other games in the lower left corners of the plots. These games represent a successful game as there is a huge population of streamers and viewers per the single game. Creating a hit game is the ultimate goal for a revenue-seeking game company, and therefore playing those types of games could be most beneficial for a streamer, if they are able to compete in what is most likely a crowded segment on Twitch. An interesting finding is that games, such as League of Legends or World of Warcraft, that are traditionally thought of as popular due to having amassed millions of active players, are not shown to be the highest watch-to-stream-time ratio holders. Since these hugely popular games attract a high number of streamers, there is much more content to watch for the same number of viewers vs. watching a game with a moderate volume of streamers playing, such as Hearthstone or online chess. Based on the findings from the linear regression analysis, in order for a game developer to be successful on the Twitch platform, it may make most sense to create a game in a genre which has a high viewer base such as the RPG space. In this way they could capitalize on a steep marginal viewership increase for hours played and try to win over a less crowded viewership market to gain revenue from.

# Methodology and Analysis of Twitch Metrics Over Time

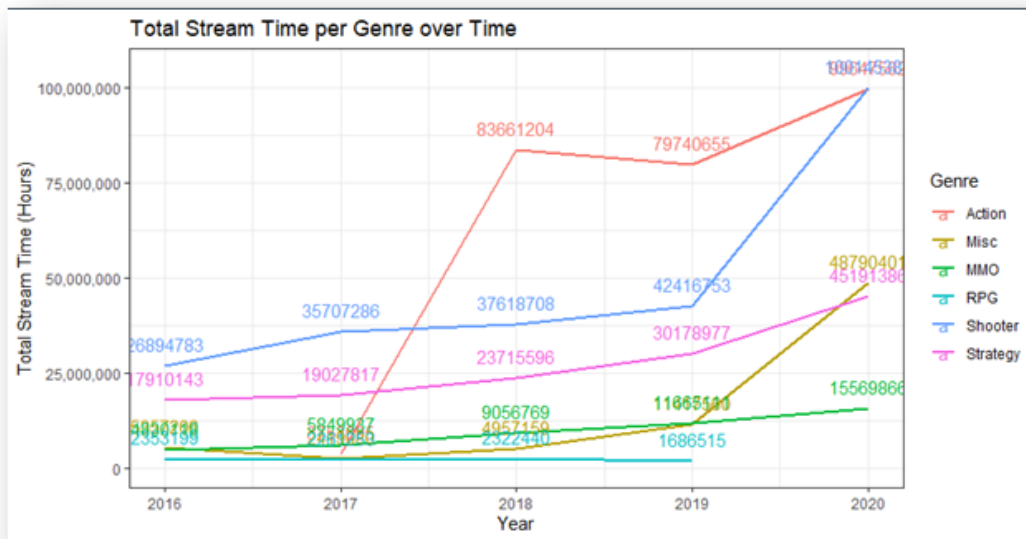
In order to gauge the growing popularity of certain genres over the years, 4 key metrics of the top grossing genres were compared from January 2016 to May 2021. By grouping the engineered SullyGnome dataset by genre and year, time-series graphs were created for the following 1 specific metrics: Average Stream Time per Genre, Average Total Watch Time per Genre, Average Viewers per Genre, and Average Channels per Genre. By comparing these metrics on historical Twitch data, this paper hoped to provide a forecast for game developers on which genre would be most popular in the future on major gaming-centric platforms like Twitch, allowing companies to focus their efforts on developing a game that will be in line with the current trends.

As there were over 800+ different types of games streamed on twitch since 2016, a sample of the top 10 games per year based on all categories measured were selected. The dataset was engineered to include the genres and metrics as was done for the analysis of linear regression.



## 1. Total Stream Time per Genre Over Time

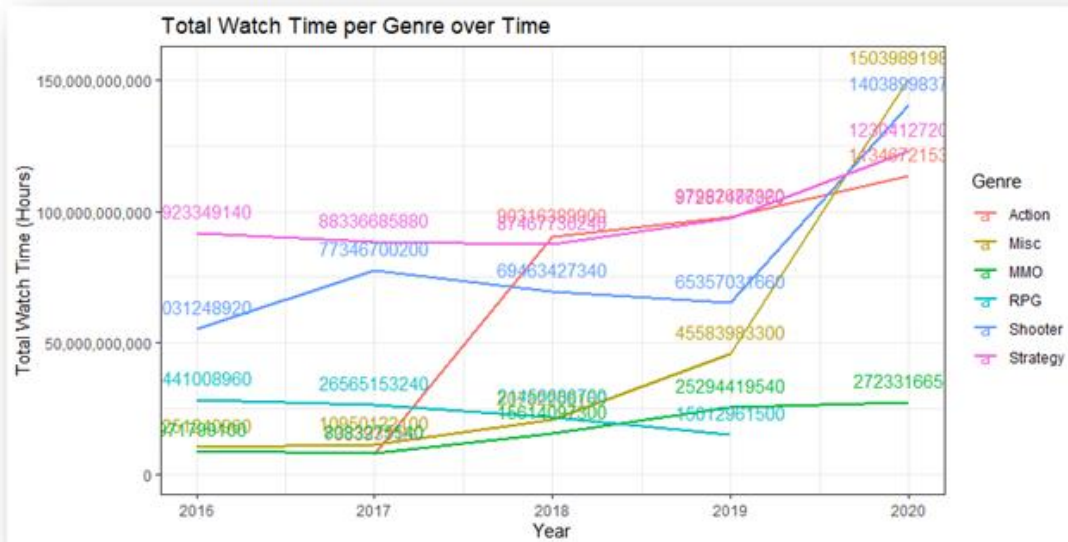
The results showed that in 2016 and 2017, Shooter games had been the most streamed genre, with Action games significantly dominating in 2018 and 2019. However, there was a resurgence in total stream time for Shooters from 2019 to 2020; therefore, overtaking the action genre.



Genre	Year	total_streamtime
RPG	2016	2,353,199
MMO	2016	4,830,118
Misc	2016	5,357,206
Strategy	2016	17,910,143
Shooter	2016	26,894,783
RPG	2017	2,261,253
Misc	2017	2,419,080
Action	2017	3,753,095
MMO	2017	5,849,937
Strategy	2017	19,027,817
Shooter	2017	35,707,286
RPG	2018	2,322,440
Misc	2018	4,957,159
MMO	2018	9,056,769
Strategy	2018	23,715,596
Shooter	2018	37,618,708
Action	2018	83,661,204
RPG	2019	1,686,515
Misc	2019	11,417,560
MMO	2019	11,665,111
Strategy	2019	30,178,977
Shooter	2019	42,416,753
Action	2019	79,740,655
MMO	2020	15,569,866
Strategy	2020	45,191,386
Misc	2020	48,790,401
Action	2020	99,647,562
Shooter	2020	100,145,387

## 2. Total Watch Time per Genre Over Time

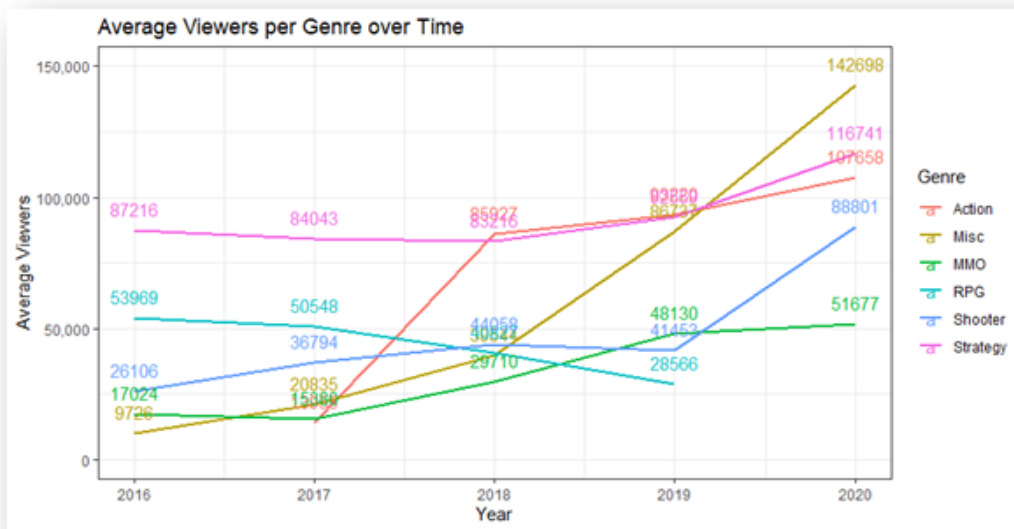
Although Shooter games were the most popular to stream in the earlier years, viewers preferred to watch more hours of Action and Strategy (i.e. Riot's MOBA League of Legends, which had been the number 1 most watched game since 2016) games up until 2020. Viewers began to watch more hours of Action and Strategy games in 2020, which can be attributed to the release of more Shooter genre games in recent years. In 2019, however, there was a sudden spike in the 'Misc.' genre: Twitch's stream categories began to expand outside of the typical gaming categories as content creators began to stream such as "Just Chatting" traveling. As this genre is outside the scope of this paper, it was omitted from the analysis.



Genre	Year	total_watchtime
MMO	2016	8,971,799,100
Misc	2016	10,251,240,960
RPG	2016	28,441,008,960
Shooter	2016	55,031,248,920
Strategy	2016	91,923,349,140
Action	2017	7,333,931,160
MMO	2017	8,083,275,540
Misc	2017	10,950,122,100
RPG	2017	26,565,153,240
Shooter	2017	77,346,700,200
Strategy	2017	88,336,685,880
MMO	2018	15,614,097,300
Misc	2018	20,782,208,160
RPG	2018	21,456,686,700
Shooter	2018	69,463,427,340
Strategy	2018	87,467,730,240
Action	2018	90,316,389,900
RPG	2019	15,012,961,500
MMO	2019	25,294,419,540
Misc	2019	45,583,983,300
Shooter	2019	65,357,031,660
Strategy	2019	97,287,486,960
Action	2019	97,982,677,320
MMO	2020	27,233,166,540
Action	2020	113,467,215,360
Strategy	2020	123,041,272,020
Shooter	2020	140,389,983,720
Misc	2020	150,398,919,800

### 3. Average Viewers per Genre over Time

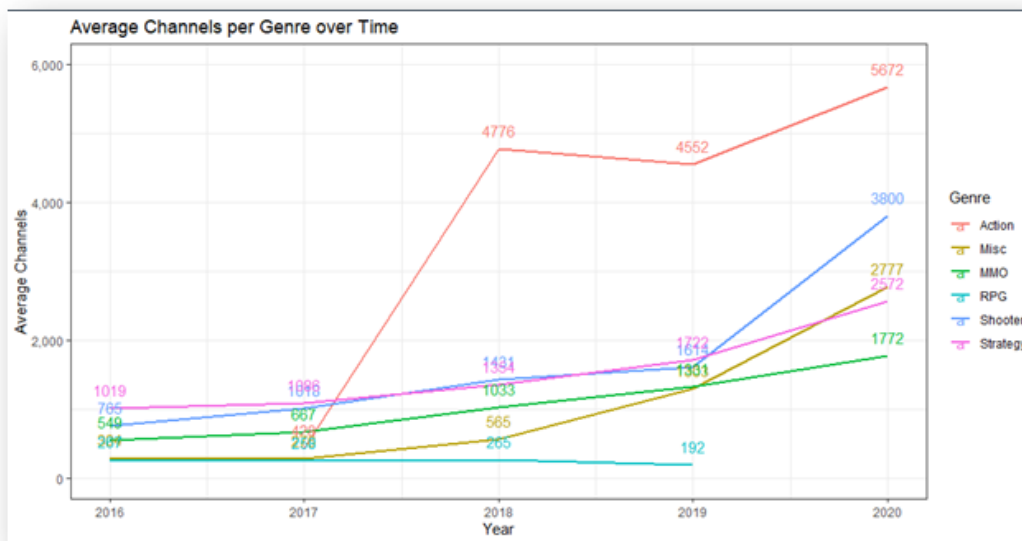
Similar to the “Total Watch Time per Genre over Time”, Action and Strategy genres were expected to have the higher average number of viewers as these genres had the most watch time among gaming-related streams. Although Action and Strategy games are leading genres in terms of viewership volumes, they had seen a decline in viewership near 2020 while the Shooter genre exponentially increased as of 2019. At the rate the Shooter genre is growing in the past two years, the average number of viewers are predicted to overtake Action and Strategy genres within the coming years.



Genre	Year	avg_viewers
Misc	2016	9,726
MMO	2016	17,024
Shooter	2016	26,106
RPG	2016	53,969
Strategy	2016	87,216
Action	2017	13,955
MMO	2017	15,380
Misc	2017	20,835
Shooter	2017	36,794
RPG	2017	50,548
Strategy	2017	84,043
MMO	2018	29,710
Misc	2018	39,544
RPG	2018	40,827
Shooter	2018	44,058
Strategy	2018	83,216
Action	2018	85,927
RPG	2019	28,566
Shooter	2019	41,453
MMO	2019	48,130
Misc	2019	86,737
Strategy	2019	92,559
Action	2019	93,220
MMO	2020	51,677
Shooter	2020	88,801
Action	2020	107,658
Strategy	2020	116,741
Misc	2020	142,698

## 4. Average Channels per Genre over Time

This paper also explored the trends of Average Channels per Genre over time. Channels differ from Streams on Twitch as Channels are defined as dedicated accounts where a streamer can post past VODs (Videos on demand) and not purely live content. streams are defined as live content displayed by streamers. In the graph below, channels specializing in the Action genres are shown to be most prevalent in recent years. However, Shooter-focused channels are also shown to be on the rise in 2020.



Genre	Year	avg_channels
RPG	2016	267
Misc	2016	304
MMO	2016	549
Shooter	2016	765
Strategy	2016	1,019
RPG	2017	258
Misc	2017	276
Action	2017	428
MMO	2017	667
Shooter	2017	1,018
Strategy	2017	1,086
RPG	2018	265
Misc	2018	565
MMO	2018	1,033
Strategy	2018	1,354
Shooter	2018	1,431
Action	2018	4,776
RPG	2019	192
Misc	2019	1,303
MMO	2019	1,331
Shooter	2019	1,614
Strategy	2019	1,722
Action	2019	4,552
MMO	2020	1,772
Strategy	2020	2,572
Misc	2020	2,777
Shooter	2020	3,800
Action	2020	5,672

## 5. Key Takeaways

By analyzing the growth of the genres over time, this paper found that Shooters have overtaken, albeit gradually, the historically leading Action and Strategy genres based on key metrics like total watches, total stream times and average viewers. This can mainly be attributed to the global release of highly competitive games such as Riot's Valorant, Blizzard's Overwatch, Epic Games' Fortnite, and Valve's Counter Strike Go. The popularity of the shooting genre will continue to expand alongside the growing competitive scene of the gaming landscape.

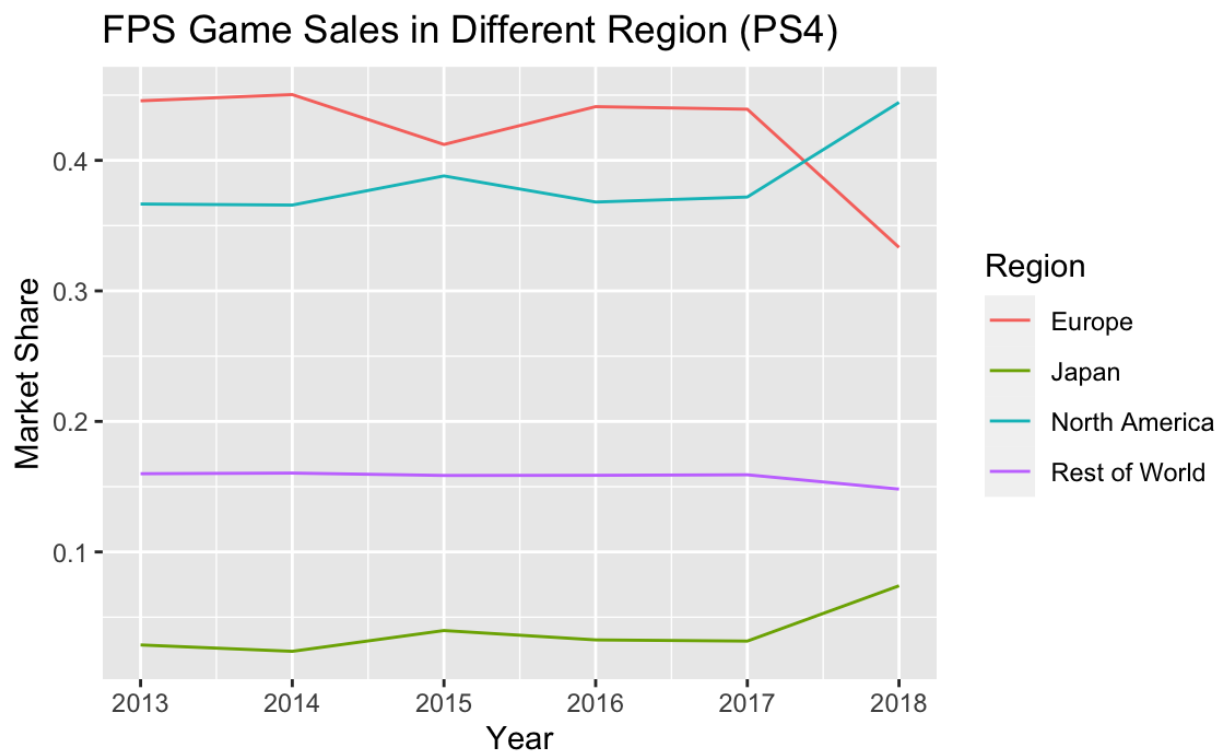
# Methodology and Analysis for Historical Sales Data per Region (FPS Games)

Based on the Twitch Metrics Over Time Visualization, it is found that the shooting game genre (FPS games) has excellent performance across different metrics. The FPS game genre has seen a strong rising trend in Total Stream Time per Genre Over Time, Total Watch Time per Genre Over Time, and Average Channels per Genre over Time. Therefore, this paper looked to explore the FPS games genre and collect the data relative to historical sales in order to provide a reference in market trends and marketing strategy. This section of the paper will exhibit the target market for FPS games, regional trends, and also serves as an extension of data matrix analysis in specific genres.

Game Sales Scraping Data were utilized and analyzed based on three different platforms (PS4, Xbox, and Others). This raw dataset was preprocessed through imputing missing values and adjusting data types. The FPS genre was then filtered and grouped by time and region. Finally, the historical sales data in different regions were visually displayed.

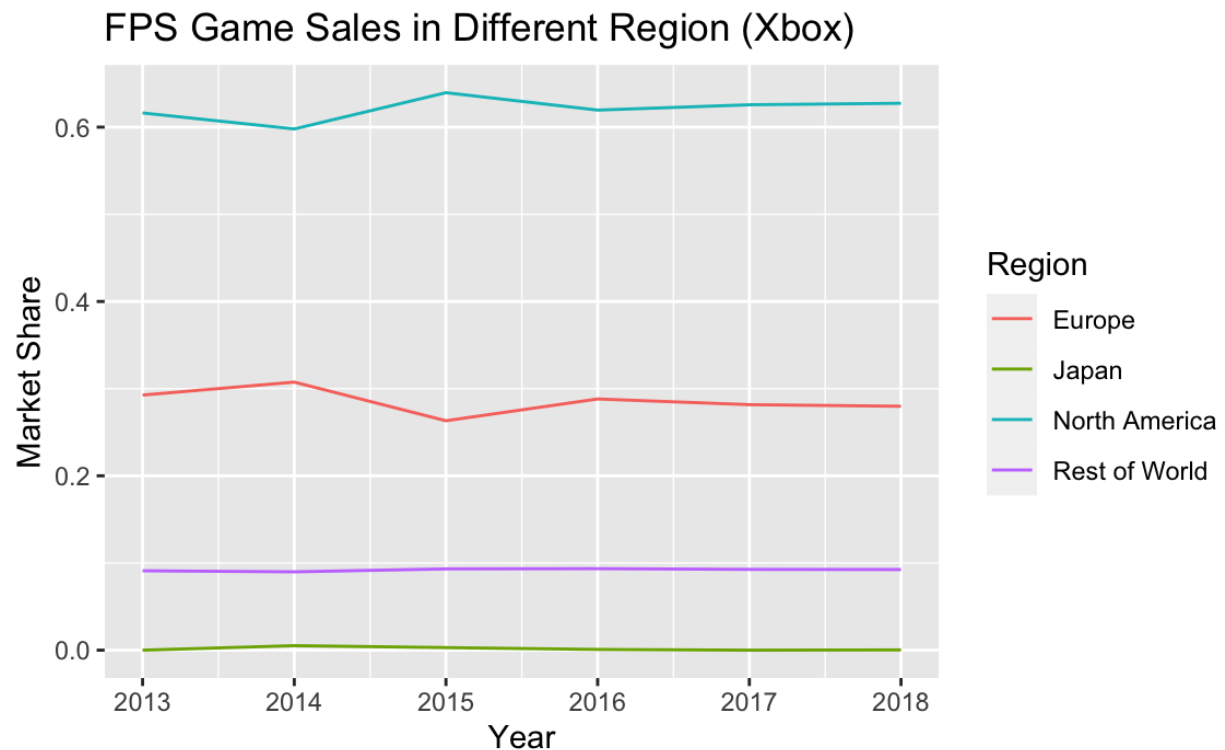
## 1. Historical Sales Data in PS4 Platform (2013-2018)

This paper found that before 2018, Europe and North America have dominated the FPS games market as they have occupied nearly 80% of sales of the total FPS market. In 2018, however, the European market was no longer the largest consumer market for FPS.



## 2. Historical Sales Data in Xbox Platform (2013-2018)

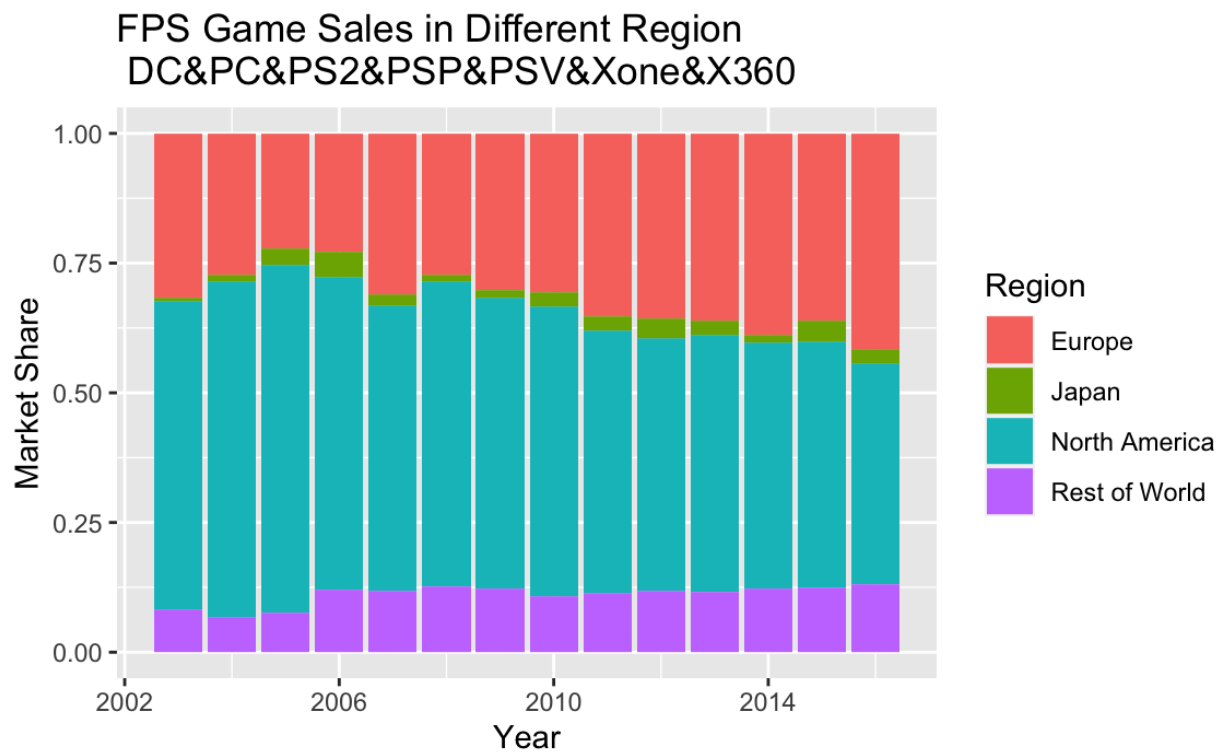
With regard to the Xbox Platform, the overall FPS gaming market is stable. North America is the main market for FPS games, which reached over 60% market share, and that outcome corresponds with the Xbox consoles Sales Data (Reference 2). On the other hand, Japanese consumers are not interested in FPS games.



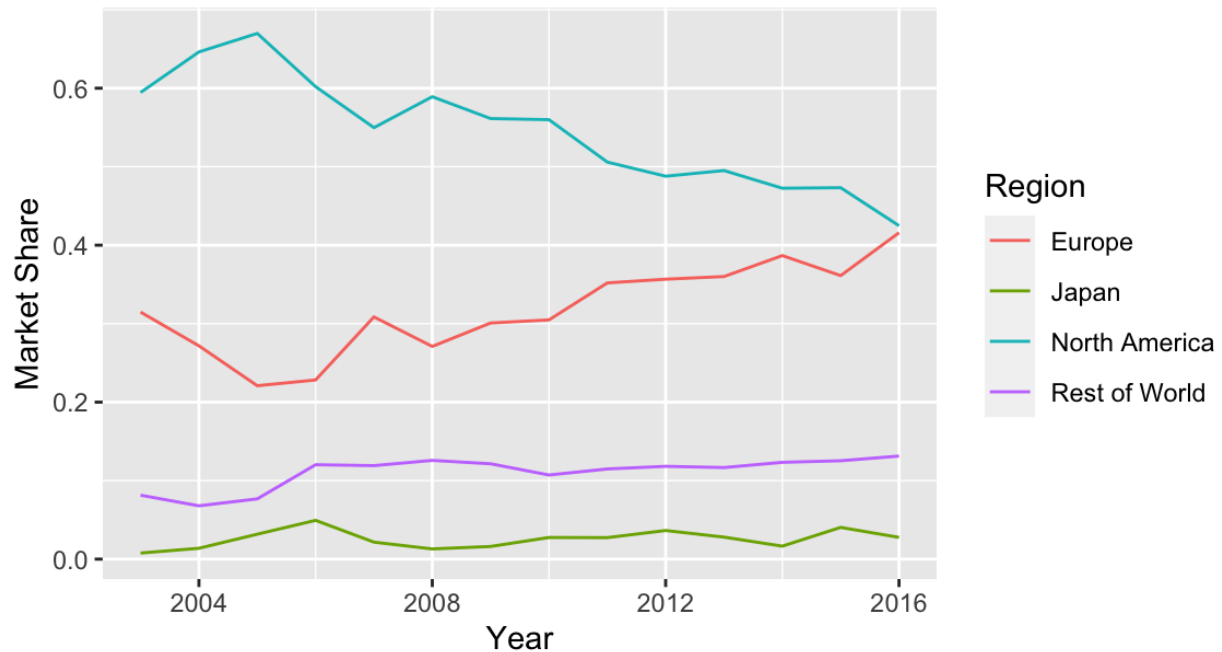


### 3. Historical Sales Data in Other Platform (2003-2016)

15 years ago, the North American market dominated the consumption of FPS games. Since 2007, the European market has grown rapidly and is projected to surpass the North American market, as shown in the graph below:



## FPS Game Sales in Different Region DC&PC&PS2&PSP&PSV&Xone&X360



Through these visual analyses, the paper found that the European market and the North American market are the main groups of FPS game consumption. The popularity of FPS games in Japan and other countries in the world is not high, and therefore can be explored as a potential market for gaming companies to incite interest in the future.

However, before expanding to other regions, market researchers need to refer to the consumption data of the game console for reference. If the platform sales of the game console are not high in this region, then the expansion of FPS game sales will have huge restrictions. For example, in the Japanese market, consumer interest in game consoles (PS4 and Xbox) is not high, so it is not feasible to promote FPS games on this platform.

Consumers in the European market are more enthusiastic about FPS games than other regions in recent years. In PS4 and other game platform categories, the European market has replaced North America as the largest consumer market.

## Summary and Recommendations

Due to the correlation between shooting games and viewing time having a 95% confidence level and a slope level close to 16, this paper is able to reject the hypothesis and confirm that streaming a FPS game will result in a better watch time and view count. Nevertheless, if the FPS genre is compared to other genres that were analyzed during the previous sections in this paper, the effectiveness of the FPS genre is not viewed as effective as some of the more popular genres such as RPG, action, and strategy, which all have slopes that outrun FPS. While the hypothesis by itself has a significance in predicting the total watch time, by looking at the stream/watch time graphs and the data from 2019-2020, the FPS genre has a steeper slope which means that the FPS genre was benefited most in Twitch watch time during the pandemic era. Overall, the FPS genre is the number one popular genre on Twitch in 2020.

However, further analysis and studies do not indicate a direct relationship between Twitch watch time and genre sales; there is not a significant increase in FPS game sales as there are regional differences in sales.

## Effect of Environment on the gaming Industry Overall

The sharp increase in gaming time during 2020 can be explained by the Coronavirus pandemic. In an article by Fortune, it was determined that there was a 81% increase in total game sales in North America compared to the last year during the pandemic time (Morris, 2021). Moreover, the article indicated that the number one bestselling game is Call of Duty: Black Ops (Morris, 2021), a leading video game franchise that is classified under the FPS genre.

The industry by itself does not expand, but with the correct strategy it can be super profitable as data and analysis have limitations in predicting individual success. For instance, the Call of Duty franchise received large help from streamers. Besides investing large amounts of money on advertising across

marketing platforms such as webpage, TV ads, Fingas also suggests that its success has something to do with their emphasis on the streamer community, for example, Twitch Platform (Fingas, 2021). Another FPS game named “Apex Legend” by itself has a 27% increase in total active players during the pandemic(Activeplayer.io, 2021), while Overwatch, previously described as a “dying game” due to reduced buzz in the community (Richman, 2021), also had a 60% increase in active players at the beginning of the pandemic. These top FPS games’ popularity reflects the industry’s trend that top-selling games are the main drivers, if not the only ones, for FPS market growth, and that suggests the market is highly competitive.

## Business implication and limitations

Based on the analyses explored in this paper and the trends of the current gaming market, this paper has determined that although FPS games could be pivotal to a game development company that is chasing profits, there remains other factors to consider that may implicate overall profitability. FPS shooting games normally require a large upfront investment during the production phase, and FPS games, in business sense, are highly substitutable since their playmakings are quite similar. Therefore, it is risky for gaming companies to dedicate all resources towards a single-genre route.

Nevertheless, FPS games have been shown to generate high profit margins for game developers and gaming companies. , given that some of the most profitable games are FPS games. Therefore, based on current market trends and sales opportunity alone, a game developing company could find FPS genre games a solid investment.. If people look at the market from a different perspective, considering that these big names in the FPS genre are increasing over scale, the other FPS games, given that the growth of the genre as a whole is not performing at this crazy level, are actually underperforming. The turning point of making a FPS game is “go big or go home.”

## Conclusion

Streaming a FPS game as a streamer or a channel on Twitch will result in more watch time and view counts, although it does not guarantee an increase in sales and revenue for a game development company. Nevertheless, the overall market performance of the FPS genre is not a direct predictor of individual success, as seen by some of the industry's leading games. Therefore, game development companies will need to take caution before going into the FPS genre as it requires high investment, both in terms of resources and financial funding, in order to find profitable success.

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- *Data was further engineered in excel: each month and year data file (January 2016 - May 2021) was downloaded and combined respectively. Extracted data for the Top 10 “Rank” and manually added “Genre” variable according to [Twitch tags](#).*
- *Yearly Top 10 data contains 12 variables (10 numerical, 2 categorical), 51 observations*
- *Monthly Top 10 data contains 12 variables (10 numerical, 2 categorical), 651 observations*

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