Trends of Video Game Ratings and Popularity

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Introduction

Playing video games is a hobby that has grown exponentially in popularity within the past few decades. With the advancement in graphics technology and a greater accessibility of consoles and games, there is a video game for everyone whether they are looking for a fun and casual family game, a challenging real-time strategy game or an immersive role-playing game.

In this analysis, I have data on video games varying in platform and genre that have been released since 1980. This data includes critic scores and user scores drawn from Metacritic, game details such as genre and console platform, and game sales by region. I will use this sample of video game data to represent the total population of release video games, including games that will be released in the future. By analyzing this data, I hope to show both video game customers and developers the underlying trends of video game critic and user ratings which will give both parties vital information on video game popularity and enjoyment in the future.

Data

This dataset of video game details and success contains 16,719 video game titles compiled by Rush Kirubi and made available on his Kaggle page.[1] Kirubi obtained sales data from a pre-existing dataset of video game sales by region and sales rank compiled by Gregory Smith through a web scraping of VGChartz.[2] According to Kirubi, his dataset is an extension of Gregory Smith's dataset with an addition of critic and user ratings from a web scrape[3] of Metacritic, a popular entertainment review website that gives reviews and ratings for video games in the form of a "Metascore" (critic score) and user score.

Unfortunately, this initial dataset is incomplete and missing data which will impact the outcome of my study. Almost all games released before 2001 do not have data on critic and user ratings because the video game reviewing website Metacritic was not founded until 2001. To address this lack of data, I removed all games with release dates prior to 2001. I also removed all

[1] https://www.kaggle.com/rush4ratio/video-game-sales-with-ratings
[2] https://www.kaggle.com/gregorut/videogamesales
[3] The web scraper program that he used can be obtained here: https://github.com/wtamu-cisresearch/scraper

games that did not have a Critic Score or User Score as these variables are distinctly important to the study of video game enjoyment and popularity. Finally, I converted values under the User Score variable to the numeric type so that I can retrieve summary statistics of the User Score data. Before cleaning, the dataset contained 16,719 observed video games. After cleaning, the dataset was reduced to 7,868 observed video games.

Variables

Platform

One variable that may give insight on video game favorability and popularity is the platform that video games are released on. There are many different gaming platforms that have emerged over the past two decades from Microsoft's Xbox consoles to the Nintendo DS. Using data on video game platforms, video game development companies can see a trend in which platforms are more popular than others which will impact the type of games companies develop and sell in the future. Table 1 displays the frequency distribution of the platform categorical variable. From the table, we can see that the leading platforms in video game quantity are the PS2 (PS2), Xbox 360 (X360), PS3 (PS3) and Xbox (XB), which are consoles produced by Sony and Microsoft. PS2 has the largest total library of games with a count of 1,242 (15.79% of all video games) and Dreamcast (DC) has the smallest library of games with a count of 4. The table reflects that in general, older platforms have larger game libraries, while the latest platforms have smaller game libraries.[4]

Table 1: Frequency Distribution of Video Game Platforms

Platform	Frequency	Percentage
PS2	1242	15.7854601
X360	911	11.5785460
PS3	819	10.4092527
XB	723	9.1891205
DS	712	9.0493137
PC	691	8.7824098
Wii	582	7.3970513
PSP	461	5.8591764
GC	448	5.6939502
GBA	434	5.5160142
PS4	251	3.1901373
3DS	168	2.1352313
XOne	168	2.1352313
PSV	120	1.5251652
WiiU	90	1.1438739
PS	44	0.5592272
DC	4	0.0508388

Genre

Another variable that I believe is beneficial to analyze regarding video game favorability and popularity is

[4] https://www.preceden.com/timelines/191578-history-of-video-game-consoles

video game genre. Video games are distributed into genres, which give a general description on the gameplay of a video game. If a person likes stories and likes the idea of going on adventures, he or she would most likely enjoy video games under the role-playing and adventure genres. On the other hand, someone who likes to use their brain to solve challenges would most likely enjoy puzzle and strategy games. The genre categorical variable could potentially be a characteristic that people use based on their own interests to determine if they will play and enjoy a video game or not. Table 2 lists the frequency distribution of the video game genre variable in the dataset. From the table, we can see that a large majority of video games released since 2001 lie within the action genre with a count of 1,857 (23.60%). The second largest genre with a count of 1,150 (14.62%) is the games genre. On the other hand, we can see that the least populated genres are the strategy and puzzle genres with counts of 290 (3.69%) and 215 (2.73%) respectively. Overall, we can see that genres that are fast-moving such as sports and shooter genres have larger libraries of games, whereas slow-moving genres such as simulation and puzzle genres have smaller libraries of games.

Table 2: Frequency Distribution of Video Game Genres

Genre	Frequency	Percentage
Action	1857	23.601932
Sports	1150	14.616167
Shooter	925	11.756482
Racing	702	8.922217
Role-Playing	699	8.884087
Misc	515	6.545501
Platform	482	6.126080
Fighting	388	4.931368
Simulation	336	4.270463
Adventure	309	3.927300
Strategy	290	3.685816
Puzzle	215	2.732588

Critic and User Scores

The final variables that I am interested in analyzing are the critic scores and user scores of video games. The data for these variables were obtained from the Metacritic website, where Metacritic compiles all individual critic ratings into a single overall rating on a 100-point scale. User scores are also compiled by Metacritic in a similar fashion as critic ratings but is instead rated on a 10-point scale. Following Metacritic's video game score systems, we can assume that a game is more enjoyable and fun if the critic and user scores are high, and a game is less enjoyable and unrewarding if the critic and user scores are low.[5] Table 3 gives the summary statistics of both critic scores and user scores, as well as other variables such as sales by region and ratings count. In this study, I will only look at the

[5] https://www.metacritic.com/about-metacritic

critic score and user score numerical variables. Looking at the table, we can see that the average in User Score (7.16/10) is proportionally higher than the average in Critic Score (68.83/100). The 25th percentile and 75th percentile are also proportionally higher for user score than compared to critic score. However, the differences between the statistics of critic score and user score are minor. From these observations, we can hold onto the idea that users tend to rate video games slightly higher than compared to critics, but not enough to make the difference between critic and user significant. We can also see that the critic count is higher than the user count by approximately 1,000.

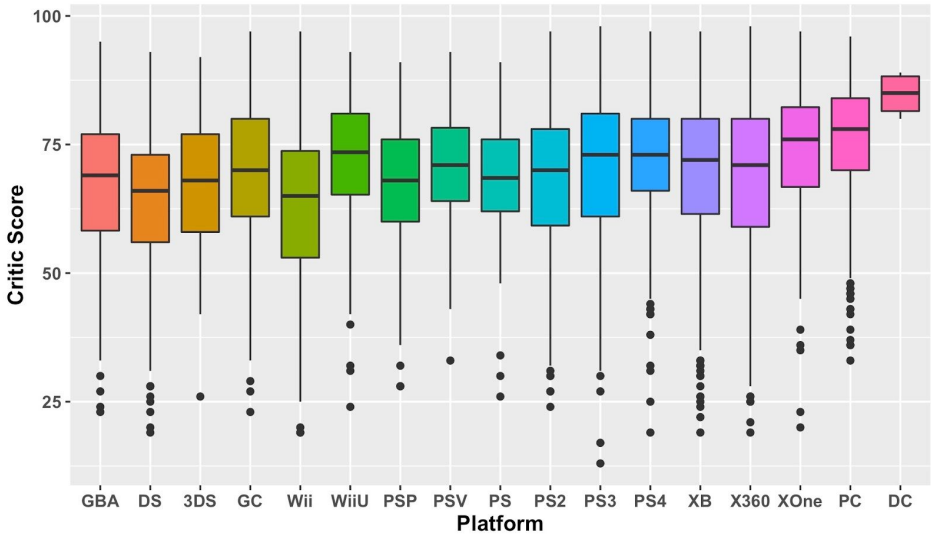
Table 3: Summary Statistics of Numerical Variables

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
NA Sales	7,868	0.35	0.90	0.00	0.05	0.34	41.36
EU Sales	7,868	0.21	0.64	0.00	0.01	0.18	28.96
JP Sales	7,868	0.05	0.25	0.00	0.00	0.01	6.50
Other Sales	7,868	0.07	0.25	0.00	0.01	0.06	10.57
Global Sales	7,868	0.68	1.82	0.01	0.09	0.64	82.53
Critic Score	7,868	68.83	13.85	13	60	79	98
Critic Count	7,868	26.81	19.09	3	12	37	113
User Score	6,833	7.16	1.44	0.50	6.40	8.20	9.60
User Count	6,833	173.38	583.32	4.00	11.00	89.00	10,665.00

Multivariate Analysis

In this analysis, I first wanted to observe the connection between video game platform and critic score. I wanted to see if certainer video game platforms have a consistent higher video game rating than others. Figure 1 displays a boxplot that shows the distribution of video game critic scores based on gaming platform. I also organized the plots by platform company, to see if one company has higher or lower ratings for its video games than others. From the plot, we can see that the medians for each platform seem to rest consistently between 65 and 75 critic scores. We can also see that the platform with the highest

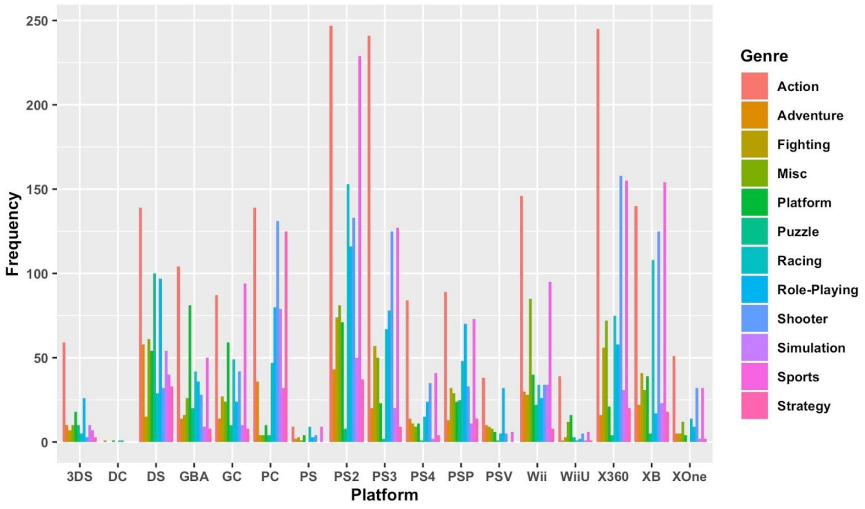
Figure 1: Distribution of Video Game Critic Score based on Platform



overall critic score average is Dreamcast, with PC and Xbox One at second and third highest. The platform with the lowest overall critic score is the Wii. Looking at the results of this analysis, there does not seem to be a trend in critic score between platforms in terms of platform, platform company or platform release date.

Another question I would like to look into is how many games of each genre are released by platform? Looking into this connection, we can get a good glimpse of the current market of games by platform and the genres that various platforms focus and specialize in. Figure 2 is a group bar graph that displays the frequency of video games released per genre by video game platform. Examining the graph, we can see that the PS2, PS3 and Xbox 360 have the most action games compared to other platforms with frequencies over 250, which leads us to the idea that the action genre is the most popular genre that game developers follow across most platforms. We can also see that the PS2 has a high number of sports video games with a frequency around 225. With high frequencies of action, racing, sports and shooter games, the PS2 seems to have the largest collection of video games by genre when compared to other platforms. On the other hand, the Dreamcast and PlayStation have the lowest frequencies of video games by genre, due to the small amounts of game releases for the two consoles after 2001.

Figure 2: Frequency of Video Games per Genre by Platform



Conclusion

In all, there seems to be little correlation between video game platform and game critic scores. Scores varied between platforms, but no overall trend could be found between platform and critic scores. On a positive note, there seems to be a trend in frequency of video games per

genre by platform. Many platforms have significantly larger counts of action games than games of other genres. A hypothesis that I can develop through this finding is that game developers will more likely develop and release games in the action genre than compared to other genres. This study can be furthered by analyzing how platforms and genres are connected to global and regional sales of video games. Some gaps and errors that existed in my data after cleaning was the inclusion of the Dreamcast (DC) and PlayStation (PS) platforms. Even though these platforms released video games after 2001, the amount of released games for these platforms was miniscule. Including these two platforms could potentially skew my results as exemplified by Figure 1, where Dreamcast is presented to have the highest average critic score, even though Dreamcast had a significantly smaller amount of games than compared to all other platforms.