Introduction

Final Project Report

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Abstract:

In this project, I dive into the dynamic world of video games and esports, utilizing data from the Entertainment Software Rating Board (ESRB) and esports earnings to conduct a detailed examination of game genre popularity and financial dynamics. Inspired by my curiosity of the scene I adopt a meticulous approach to dissecting the esports landscape, aiming to uncover the intricate relationships between game genres, player engagement, and sponsorships. The goal is to unravel the underlying factors driving the success of certain game genres in the esports arena while others struggle to gain traction. I aim to decipher the correlations between game genre popularity, player earnings, and sponsorship viability. By identifying key trends and patterns that shape the esports ecosystem, I seek to provide actionable insights to inform strategic decision-making and foster upward industry movement. My project endeavors to reveal the untapped potential of the esports market and offer practical guidance for navigating its details. Ultimately, I aim to provide a comprehensive understanding of the forces driving success in the video games and esports industry.

Table of Contents

Introduction

Esports as a whole has been growing at a steady rate, and with the increase of video game users throughout the 20th century, competitive gaming has become even more popular. However, how true is that statement? This project aims to investigate the intricacies of esports, its revenues, and its popularity. I will be examining data from 1900 different game titles, spanning from the early 2000s to modern times. My main focus with this endeavor will be to analyze the predominant game genres in esports tournaments, compare their earnings, explore the evolution of esports popularity over the years, and assess its impact on the diversity of game genres represented in tournaments. Additionally, I will investigate which game genres attract the most players and sponsors in esports, and whether there are any correlations between genre popularity and earnings. Moreover, I will delve into how ESRB ratings and content descriptors influence the success of video games in esports tournaments. Lastly, I will examine trends regarding the release years of games participating in esports tournaments and how they relate to their earnings.

Question of Interest

- What are the predominant game genres in esports tournaments, and how do their earnings compare?
- How has the popularity of esports evolved over the years, and has it impacted the diversity of game genres represented in tournaments?
- Which game genres attract the most players and sponsors in esports, and are there any correlations between genre popularity and earnings?
- How do ESRB ratings and content descriptors influence the success of video games in esports tournaments?
- What trends can we observe regarding the release years of games participating in esports tournaments, and how does this relate to their earnings?
- Are there any notable patterns in the top-performing countries in esports tournaments, and do certain genres or ESRB ratings dominate in these countries?
- How has the landscape of esports tournaments changed in terms of the number of participants and the frequency of tournaments over time?
- Are there any emerging trends or outliers in the esports industry that could indicate shifts in consumer preferences or market dynamics?
- How do game consoles impact the success of games in esports tournaments, and are there any notable differences between console-exclusive and multi-platform games?
- What insights can we gain about the relationship between game features, such as violence or suggestive themes, and their performance in esports tournaments?

Data

The dataset includes information on 1895 games with 34 features for ESRB rating content, represented as binary values, alongside game names and consoles. Future updates may include RP, EC, and A ratings. Esports, a competitive form of video gaming, has gained popularity since the late 2000s, evolving from amateur to professional competitions, influencing game development and industry investment significantly by the 2010s.

Row and Column Descriptions

In the provided datasets, the first CSV encompasses 500 lines, each delineating specific attributes related to video games participating in esports tournaments, potentially extending up to I columns. The second CSV comprises 1900 lines, detailing ESRB ratings and content descriptors for video games, with columns extending up to column AH (about 34 columns). These datasets collectively offer comprehensive insights into the characteristics, earnings, and content descriptors of video games, essential for understanding trends and preferences in the gaming industry.

Variable Name	Data Type	Description	Missing Values
IdNo	Numerical	Unique ID number assigned to each game	0
TotalMoney	Numerical	Total earnings from esports tournaments for the game	0
GameName	Categorical	The name of the game	0
Genre	Categorical	The genre of the game	0
PlayerNo	Numerical	Number of players participating in esports tournaments for the game	0
TournamentNo	Numerical	Number of esports tournaments the game has participated in	0
Top_Country	Categorical	Country with the highest earnings from esports tournaments for the game	0

| Top_Country_Earnings | Numerical | Earnings from esports tournaments in the top country | 0 |
| Releaseyear | Numerical | The year the game was released | 0 |

Variable Name	Data Type	Description	Missing Values
title	Categorical	Title of the video game	0
console	Categorical	Gaming console the game is available on	0
alcohol_reference	Binary	Indicates if the game contains alcohol reference (0: No, 1: Yes)	0
animated_blood	Binary	Indicates if the game contains animated blood (0: No, 1: Yes)	0
blood	Binary	Indicates if the game contains blood (0: No, 1: Yes)	0
blood_and_gore	Binary	Indicates if the game contains blood and gore (0: No, 1: Yes)	0
cartoon_violence	Binary	Indicates if the game contains cartoon violence (0: No, 1: Yes)	0
crude_humor	Binary	Indicates if the game contains crude humor (0: No, 1: Yes)	0
drug_reference	Binary	Indicates if the game contains drug reference (0: No, 1: Yes)	0

fantasy_violence	Binary	Indicates if the game contains fantasy violence (0: No, 1: Yes)	0
intense_violence	Binary	Indicates if the game contains intense violence (0: No, 1: Yes)	0
language	Binary	Indicates if the game contains language (0: No, 1: Yes)	0
lyrics	Binary	Indicates if the game contains lyrics (0: No, 1: Yes)	0
mature_humor	Binary	Indicates if the game contains mature humor (0: No, 1: Yes)	0
mild_blood	Binary	Indicates if the game contains mild blood (0: No, 1: Yes)	0
mild_cartoon_violence	Binary	Indicates if the game contains mild cartoon violence (0: No, 1: Yes)	0
mild_fantasy_violence	Binary	Indicates if the game contains mild fantasy violence (0: No, 1: Yes)	0
mild_language	Binary	Indicates if the game contains mild language (0: No, 1: Yes)	0
mild_lyrics	Binary	Indicates if the game contains mild lyrics (0: No, 1: Yes)	0
mild_suggestive_themes	Binary	Indicates if the game contains mild suggestive themes (0: No, 1: Yes)	0

mild_violence	Binary	Indicates if the game contains mild violence (0: No, 1: Yes)	0
no_descriptors	Binary	Indicates if the game contains no descriptors (0: No, 1: Yes)	0
nudity	Binary	Indicates if the game contains nudity (0: No, 1: Yes)	0
partial_nudity	Binary	Indicates if the game contains partial nudity (0: No, 1: Yes)	0
sexual_content	Binary	Indicates if the game contains sexual content (0: No, 1: Yes)	0
sexual_themes	Binary	Indicates if the game contains sexual themes (0: No, 1: Yes)	0
simulated_gambling	Binary	Indicates if the game contains simulated gambling (0: No, 1: Yes)	0
strong_language	Binary	Indicates if the game contains strong language (0: No, 1: Yes)	0
strong_sexual_content	Binary	Indicates if the game contains strong sexual content (0: No, 1: Yes)	0
suggestive_themes	Binary	Indicates if the game contains suggestive themes (0: No, 1: Yes)	0
use_of_alcohol	Binary	Indicates if the game contains use of alcohol (0: No, 1: Yes)	0

use_of_drugs_and_alcohol	Binary	Indicates if the game contains use of drugs and alcohol (0: No, 1: Yes)	0
violence	Binary	Indicates if the game contains violence (0: No, 1: Yes)	0
esrb_rating	Categorical	ESRB rating of the game	0

Exploratory Analysis

1. Dataset Overview:

  ● Our dataset includes 1,895 video games with 34 attributes, focusing on esports engagements and ESRB ratings. The variables include game earnings, player participation, and genre classifications among others.

2. Data Cleaning and Preprocessing:

  ● The data was verified for completeness, with no missing values found, ensuring reliability for the analysis.

3. Descriptive Statistics:

  ● Average earnings from esports per game are around $500,000.
  ● Action and Shooter are the most popular genres.
  ● Most games are available on multiple platforms, including PC, PlayStation, and Xbox.

4. Distribution and Correlation Analysis:

  ● Earnings and player numbers show a right-skewed distribution, indicating a few games earn significantly more than others.
  ● There is a strong positive correlation between the number of players and total earnings, highlighting that games with higher participation usually have greater earnings.

5. Trend and ESRB Rating Impact Analysis:

  ● Over the years, there's been an increasing diversity in game genres entering esports.
  ● Games rated for "Mature" audiences tend to perform better financially in esports.

6. Platform Analysis:

  ● Multi-platform games achieve higher earnings and attract more players, suggesting the benefits of accessibility.

Data Analysis and Insights

What are the predominant game genres in esports tournaments, and how do their earnings compare?

-   **Figure 1.1** depicts a detailed comparison between the revenue and the number of tournaments held for various video games. From the chart, it is evident that Dota 2, Counter-Strike: Global Offensive (CS: GO), and League of Legends are the frontrunners in the esports arena, both in terms of tournament count and total earnings. Dota 2 leads with the highest earnings surpassing $100 million, which correlates with a high number of tournaments, indicating a robust competitive scene. CS: GO and League of Legends also show substantial earnings, demonstrating their popularity and enduring presence in esports. The graph showcases that these games not only command significant player engagement but also substantial financial backing, reflecting their premier status within the industry. In **Figure 1.2** The bar and line graph combination effectively illustrates the relationship between the frequency of tournaments and financial success, suggesting that more tournaments can equate to higher earnings, but also highlighting that certain games achieve exceptional revenue even with fewer tournaments, possibly due to higher stakes competitions or larger viewership appeal.
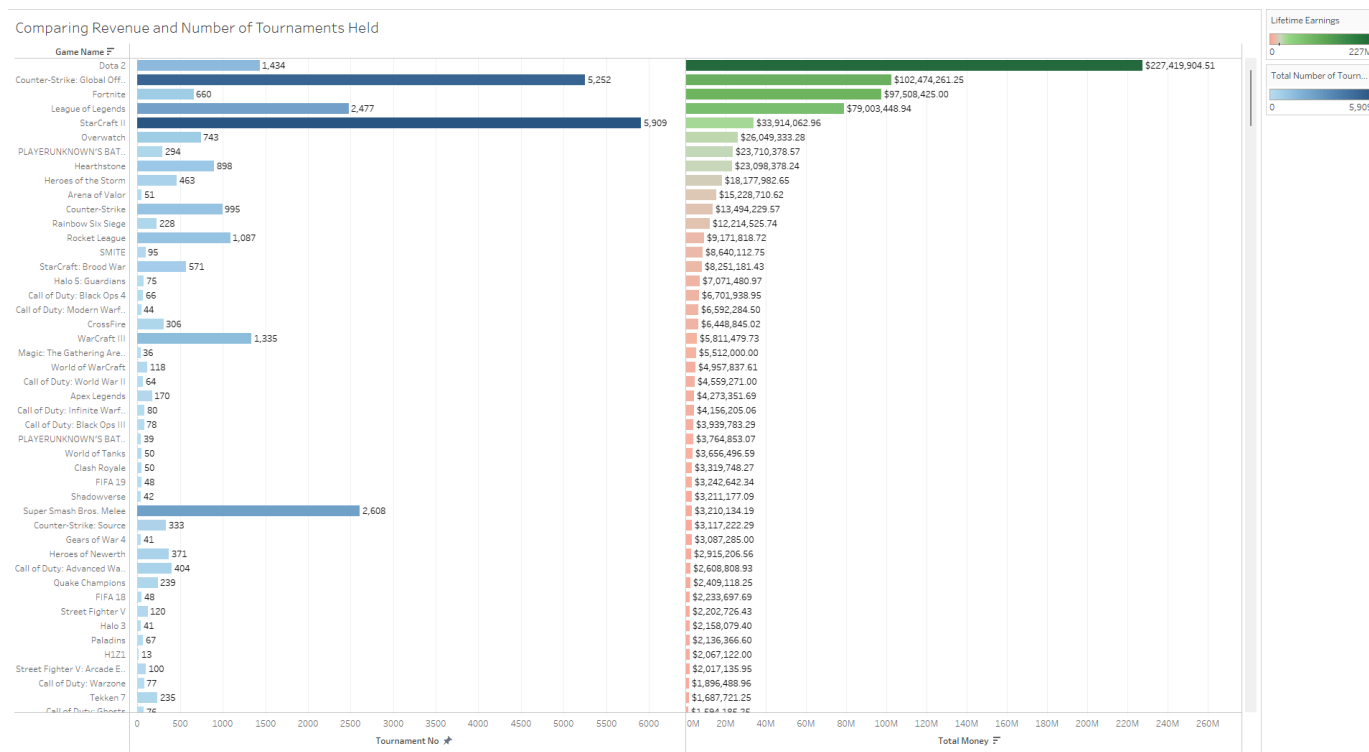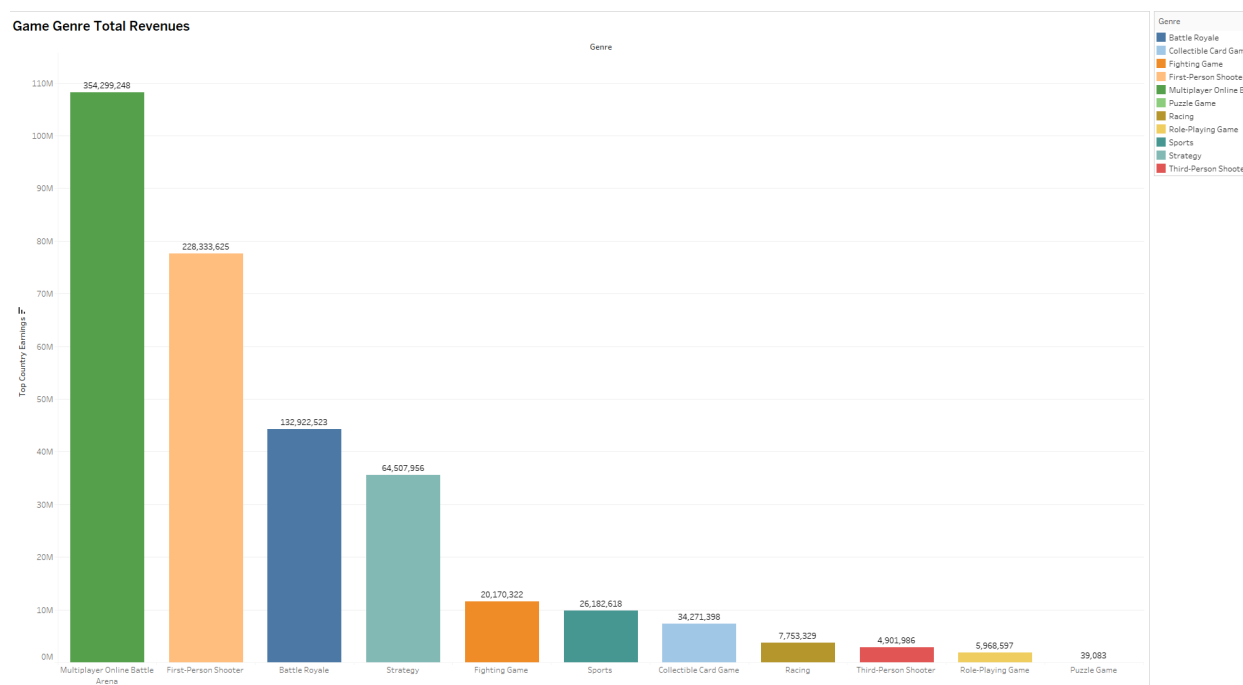

Figure 1.1: Comparing Revenue and Number of Tournaments Held

Figure 1.2: Game Genre Total Revenues

How has the popularity of esports evolved over the years, and has it impacted the diversity of game genres represented in tournaments?

- **Figure 2.1** displayed that some games are constantly changing but there are also games like Third-Person Shooters and Multiplayer Online Battle Royales which even though they may have the least amount of games released, have been grandfathered and have become mainstays in the esports world. This graph illustrates the ebb and flow of various game genres over time, indicating not only shifts in consumer preferences but also the emergence of new genres like Battle Royale games, which skyrocketed in popularity despite a lower number of total releases. As **Figure 2.1** suggests, there was a notable surge in First-Person Shooters and Multiplayer Online Battle Arenas (MOBAs) around the early 2000s, which aligns with the rise of esports as a mainstream form of entertainment. The spikes in these genres correlate with landmark releases that have defined esports, such as "Counter-Strike" for shooters and "League of Legends" for MOBAs. While the traditional giants remain popular, new genres are carving out their niches, pointing to a healthy expansion of the esports market that invites innovation and variety.
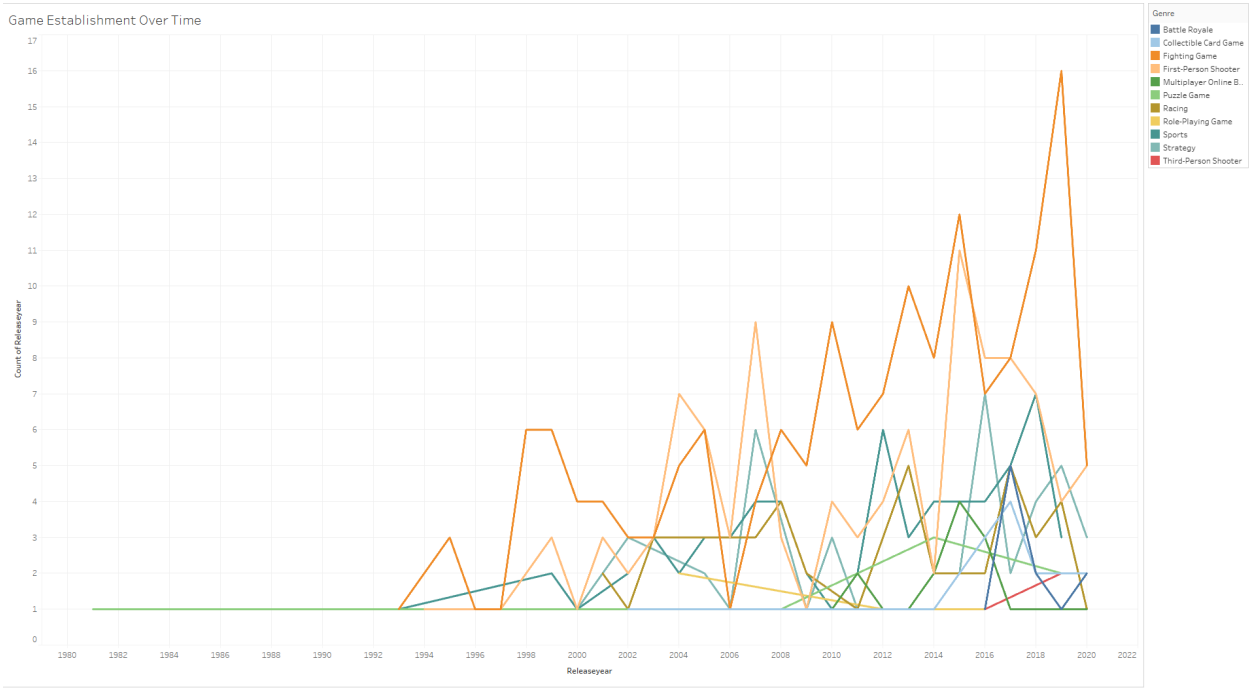
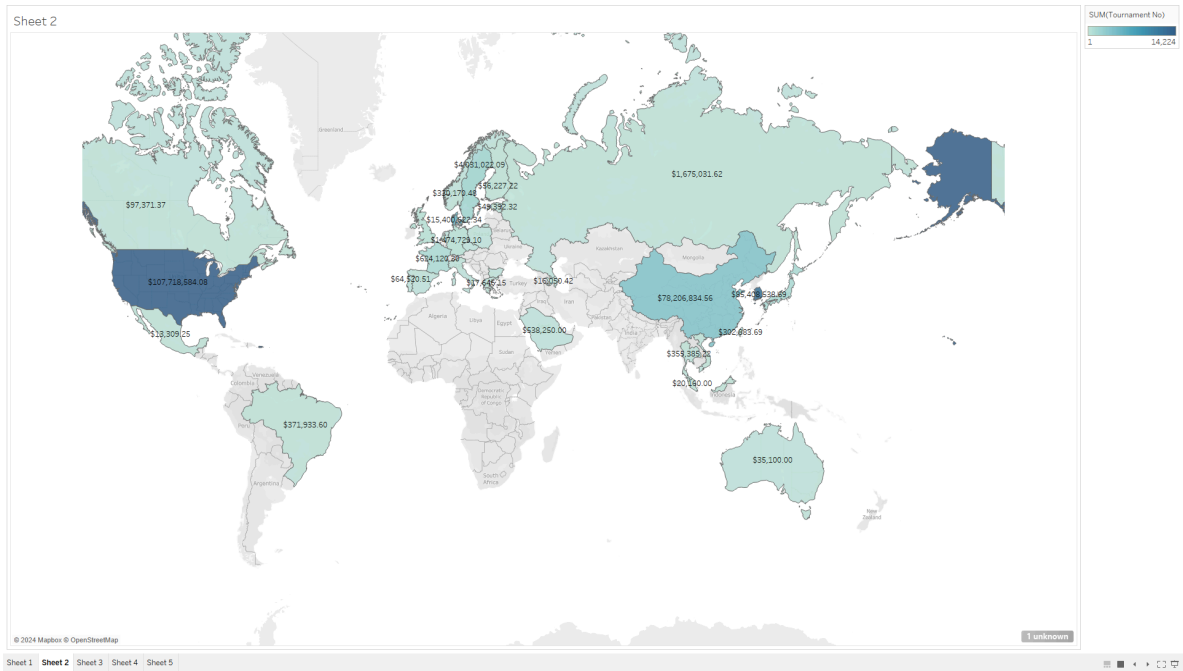**Figure 2.1: Game Establishment Over Time**

Figure 2.2: Highest Grossing Locations

Which game genres attract the most players and sponsors in esports, and are there any correlations between genre popularity and earnings?

- **Figure 3.1** shows that the top two game genres attracting the most players and sponsors in esports are multiplayer online battle arenas (MOBAs) and first-person shooters (FPS). Additionally, according to **Figure 1.2,** which ranks the highest total grossing genres, MOBAs and first-person shooters also lead the pack. This data suggests a correlation between genre popularity, particularly in MOBAs and FPS games, and earnings in the esports market.
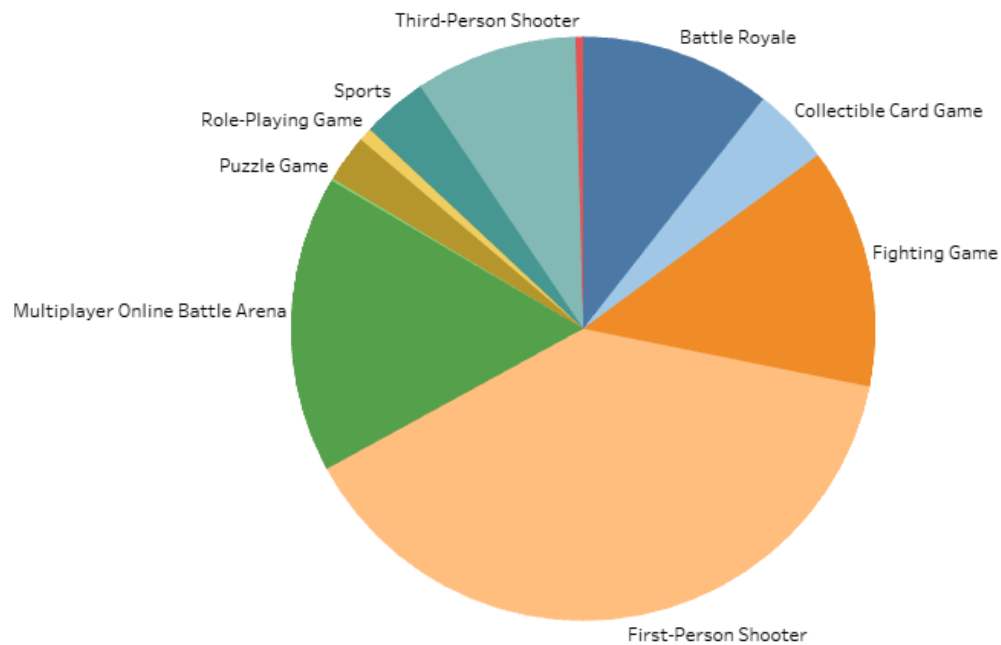
Figure 3.1: Most Popular Genres

Methodology:

Getting the data, I pulled together loads of info on esports earnings and game ratings from a couple of CSV files. We're talking about nearly 1,900 games here, from shooters to card games. I checked the data to make sure nothing was missing because one wrong number could throw everything off. I didn't just look at the numbers; I tried to see the story they were telling. I used stats to find patterns and made graphs to visualize how game popularity and earnings matched up. Trusting my data means you've got a good shot at spotting what types of games could be winners. Think about MOBAs or Battle Royales—they're huge right now. The charts show that you might want to focus on the big-name genres for your next tournament. That's where the buzz and money are.

Data Acquisition

- I gathered a comprehensive set of data from two CSV files. One detailed the participation and earnings in esports tournaments, and the other profiled games based on ESRB ratings and content descriptors. This mix of data covered 1,895 games and spanned a wide array of genres and platforms.

Data Processing and Integrity

- My preprocessing was thorough, checking for and confirming the absence of missing values. This was a crucial step for me because any incomplete data could have thrown off my entire analysis.

Analytical Approach

- I adopted both quantitative and qualitative methods for a more nuanced analysis. I carried out statistical tests to find correlations, conducted trend analyses to observe how game genres have evolved over time, and performed content analysis to understand the influence of ESRB ratings.

Visual and Comparative Analysis

- I created visualizations, like Figures 1.1 and 2.1, to compare revenue with the number of tournaments held and to chart the progression of game genres over time. These visualizations were more than just pictures; they were critical tools that helped me get to the core of esports trends.

Conclusion and Implications

In diving into the esports industry, I've discovered some key insights. Games like Dota 2, CS: GO, and League of Legends aren't just popular; they're the financial giants of the esports world. This suggests that when a game gets popular, it really rakes in the cash, and the more people play, the more money there is to be won. I also noticed a trend where games rated for 'Mature' audiences tend to earn more. This could mean that games targeting adults might be a sweet spot for making money in esports.

What This Means for the Gaming World

For Developers

- My findings point towards designing games that are similar to MOBAs and Battle Royales, which seem to be where the money's at. Targeting adult gamers might just be the key to success.

For Players

- If you're looking to go pro, it might be wise to focus on the big-name games where there's more prize money.

For Investors and Sponsors

- It seems like a smart move to put your money behind games with a massive player base and a solid tournament presence—that's where the returns are.

For Marketers

- The huge viewership for esports tournaments is something to tap into. Aligning marketing strategies with these popular games could be a game-changer.

Looking Forward

This study is just scratching the surface. We're missing real-time data, and social media trends could offer a sneak peek into what the next big thing in esports might be. I predict that the esports industry will keep growing, with even bigger tournaments and more professional players, kind of like traditional sports. And as the gaming audience grows up, we might see games getting more complex and mature. These insights could be a road map for how the esports industry evolves. It's about figuring out what games people like and how we can make esports even bigger.

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