GAME GENRE TREND ANALYSIS

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AGENDA

- Introduction

- Project Overview

- Data Overview

- Game Genre Overview

- Review Score Trends

- Revenue Trends

- Ownership Trends

- Key Findings & Recommendations

- Exploring Game Data With TF-IDF And Cosine Similarity

- Functional Blocks

- Future Outlook

- Conclusion

- Future Project Enhancements

INTRODUCTION

In the ever-evolving landscape of the gaming industry, understanding the dynamic preferences of gamers regarding different genres is crucial for developers, publishers, and marketers. However, with the vast amount of data available, extracting actionable insights becomes challenging.

PROJECT OVERVIEW

Project Goals:

- Our primary goal is to analyze trends and patterns in video game genres using a dataset consisting of thousands of video games.

- We aim to identify the popularity and performance of specific genres over time, considering metrics such as total revenue, rating score, number of owners and release date.

Expected Outcomes:

- We anticipate uncovering insights into the evolution of video game genres, including shifts in popularity, emerging trends, and factors influencing consumer preferences. Our primary metrics include revenue, ratings, release date and total number of reviews.

- By analyzing genre trends, we aim to provide actionable insights for game developers, publishers, and marketers, enabling them to make informed decisions about game development, marketing strategies, and platform optimization.

Impact on Business/Society:

- For businesses in the gaming industry, our analysis will offer valuable insights into consumer behavior and preferences, facilitating the development of more targeted and successful products.

- Additionally, our findings may contribute to a deeper understanding of the role of video games in society, shedding light on trends in entertainment consumption and cultural preferences.

DATA OVERVIEW

GAMES DATASET

- **Data Source:** Steam API

- **Number of Distinct Games:** 38471

- **Number of Games in Each Genre:**

  - Battle Royal - 1030

  - Multiplayer - 318

  - Role Playing Games (RPG) - 15758

  - Racing - 1754

  - Strategy - 10281

  - Sports - 1606

  - Free to Play - 605

  - Paid - 38399

DATA PREPARATION AND ANALYSIS METHODOLOGY

- **Dataset Segmentation by Genre:** Segmented the dataset to classify games into distinct genre categories for focused analysis.

- **Title Data Standardization:** Cleansed the 'Titles' column by removing all special characters to ensure data consistency across the dataset.

- **Data Type Conversion:** Transformed 'Review Scores' and 'Revenue Estimated' columns to numerical formats to enable quantitative analysis.

- **Data Cleansing:** Eliminated rows containing NaN values and duplicates to maintain data integrity and accuracy in the dataset.

- **Ownership Estimation through Review-Based Multiplier:** Applied the Boxleiter method leveraging the Review to Sale Multiplier along with the annual total number of reviews to estimate the ownership numbers for games categorized by genre.

GAME GENRE OVERVIEW

- **Battle Royale**: Competitive survival games where players are dropped into a shrinking play area and must be the last one standing.

- **Multiplayer**: Games designed for or that support multiple players to play simultaneously, either cooperatively or competitively.

- **Role Playing Games (RPG)**: Games where players assume the roles of characters in a fictional setting and take control over many of their actions.

- **Racing**: Games that simulate racing competitions, whether with cars, motorcycles, or other vehicles, often emphasizing speed and vehicle control.

- **Strategy**: Games that emphasize strategic, tactical, and sometimes logistical challenges, often with resource management and long-term planning.

- **Sports**: Games that simulate the playing of traditional physical sports, such as soccer, basketball, or golf.

- **Free to Play**: Games that are free to download and play, often monetized through in-game purchases or ads.

- **Paid**: Games that require a one-time purchase to download and play, with no initial cost barrier.

REVIEW SCORE TRENDS

- **Overall Increase in Scores Over Time**: There appears to be a general trend of increasing review scores over time across all genres. This could suggest either an improvement in game quality, a shift in reviewing patterns, or changes in consumer expectations and preferences.

- **Paid vs. Free to Play**: The Paid genre consistently outperforms Free to Play in terms of average review scores. This might indicate that consumers perceive a higher value in paid games, which could be due to better production quality, content, or absence of in-game purchases which are often found in free-to-play models.

- **Top Performers**: The Strategy genre has the highest average review score in the most recent year, followed closely by the Sports genre. These high scores could reflect a dedicated fan base or a smaller, more curated set of game offerings that tend to receive better reviews.

- **Stability in Some Genres**: While the overall trend is upwards, some genres such as RPG and Multiplayer show relatively stable review scores across the years, suggesting consistent game quality or a matured genre with established standards.


Average Review Score by Genre and Year
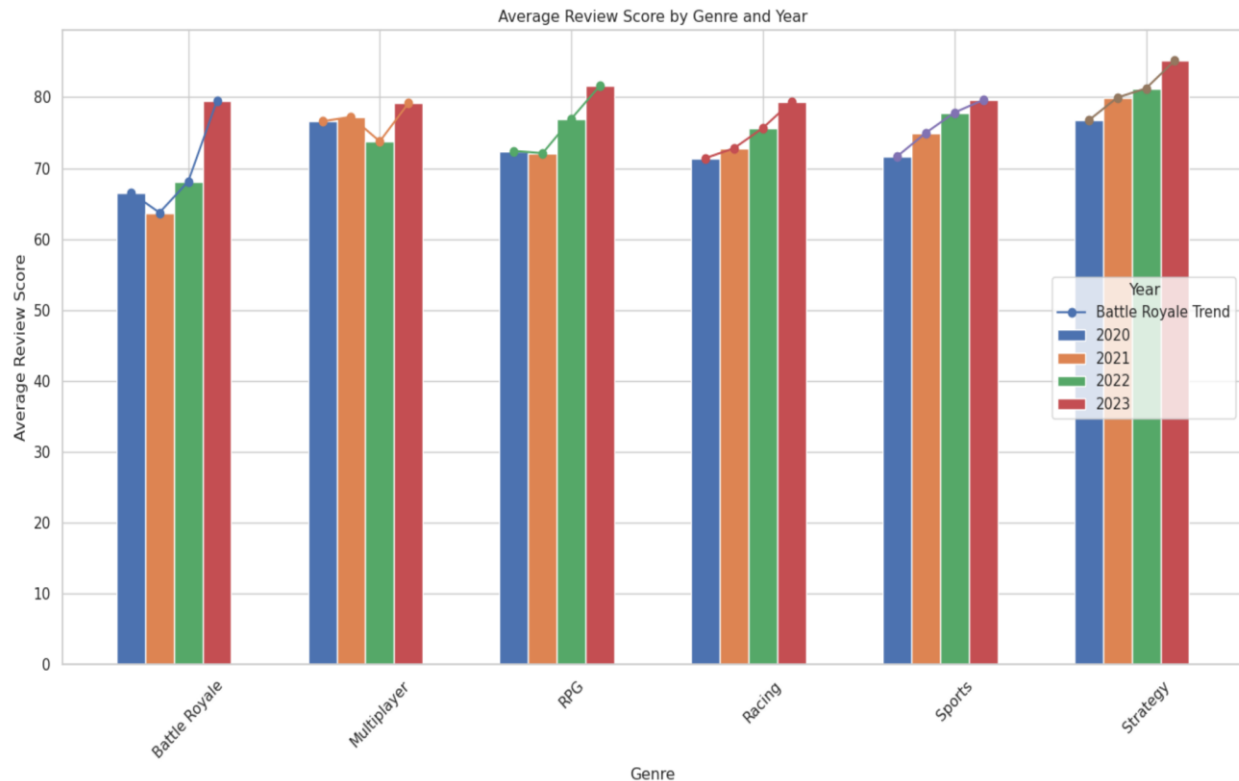
REVENUE TRENDS

- **Racing and Sports genres show moderate performance**: Racing and sports games appear to have moderate revenue figures. These genres may appeal to niche audiences with specific interests, which could explain their middle-range performance in revenue compared to RPGs and Strategy games.

- **Variability in Free to Play (F2P) revenue**: The Free to Play genre shows fluctuations in revenue, which could be due to the varying success of monetization strategies in these games. Some F2P titles may rely on microtransactions or in-game advertising, which can lead to inconsistent revenue streams based on player engagement and spending behaviors.

- **Overall trend of increasing revenue**: A general upward trend in revenue across most genres suggests that the gaming industry is growing. It highlights the potential for increased investment in game development, marketing, and customer engagement to capitalize on this expanding market.

- **The impact of top titles**: The presence of top games in each genre indicates that standout titles can significantly impact overall revenue. It may be beneficial for developers and publishers to focus on creating high-quality titles that have the potential to become hits in their respective genres.

- **Diversity in profitable genres**: The variety among top-performing genres indicates that there's no single formula for success when it comes to genre. A diversified portfolio could be beneficial for developers and publishers to cater to different audience segments and mitigate market risks.


Average Revenue by Genre (2017-2023)
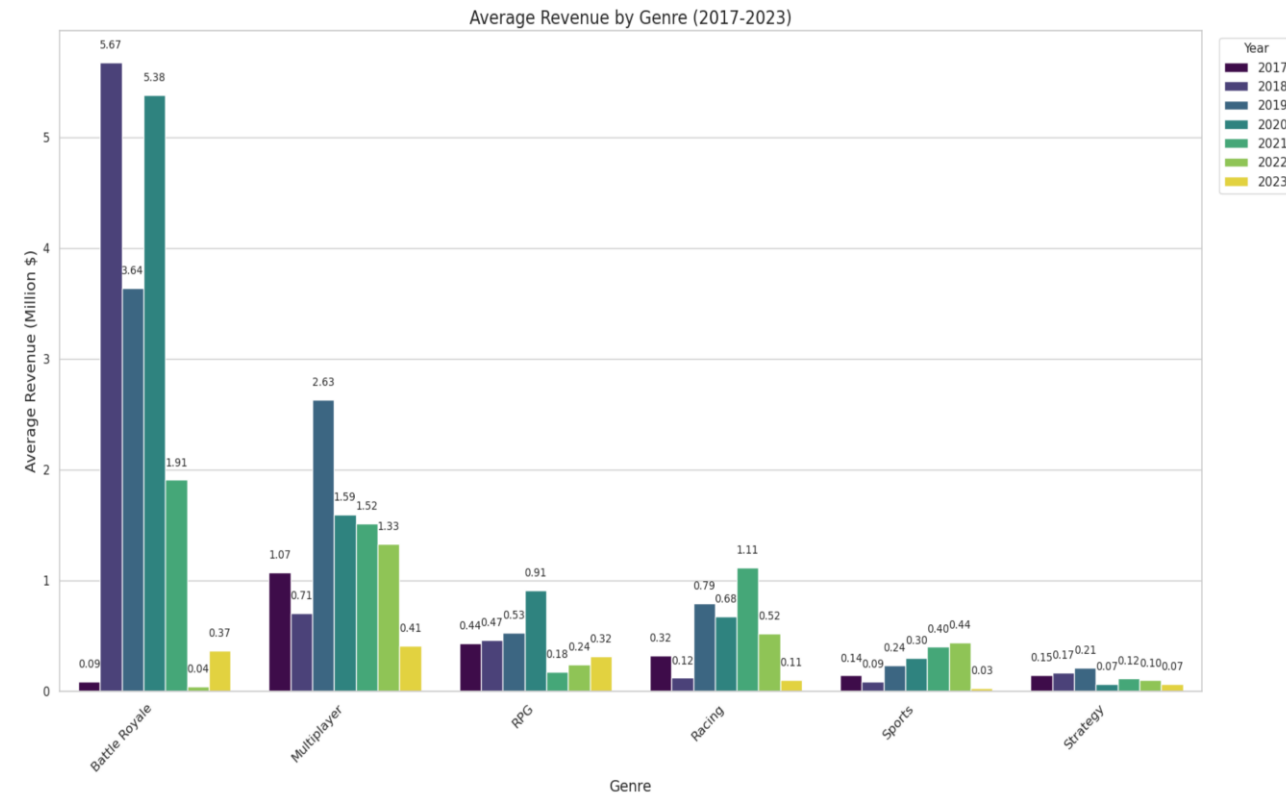
OWNERSHIP TRENDS

- **Popularity Peaks and Variances:** There is a standout peak in popularity for certain games within genres, suggesting that while average ownership might provide one picture of genre performance, individual game titles can significantly outperform the average, possibly due to virality, critical acclaim, or other factors that drive player engagement.

- **Genre Life Cycle Trends:** Fluctuations in the average number of game owners across years within genres may indicate the life cycle of popularity for certain game types. Some genres experience spikes in ownership that could correspond with the release of highly anticipated titles or innovations within the genre, while others may see a decline, which could be due to market saturation or a shift in player preferences.

- **Impact of Business Models:** There's a notable difference between the performance of Free to Play games versus Paid games, with Free to Play games generally attracting more owners. This reflects the accessibility of the free-to-play model and its effectiveness in drawing in a larger player base, which may not always translate into better review scores or sustained popularity.

- **Evolution of Player Preferences:** The trends also reflect an evolution in player preferences over time. Genres that once dominated in ownership numbers may see a shift as new genres gain popularity. This could be a result of technological advancements, changing demographics, or the rise of new gaming platforms that better support certain genres.

Average Game Owners by Genre and Year
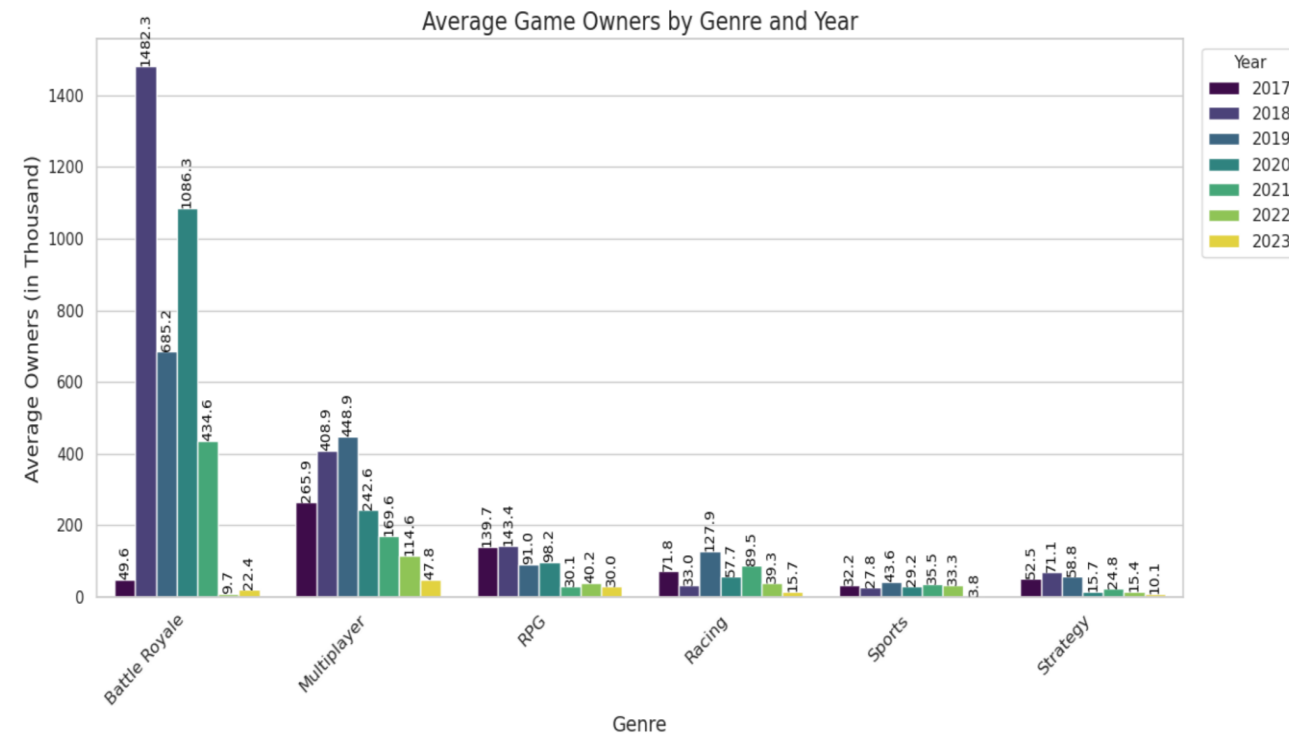
KEY FINDINGS & RECOMMENDATIONS

- **Monitor the Rise of Paid Games**: Despite the dominance of Free to Play games in terms of ownership, Paid games have shown a significant increase in average revenue over the years. This might indicate a growing market segment willing to pay upfront for quality content.

- **Adapt to Changing Player Preferences**: There's a notable upward trend in review scores across most genres, implying that players' expectations are increasing. Developers should focus on higher quality content and improved gameplay experiences to meet these expectations.

- **Leverage User Reviews for Improvement**: Since user reviews have shown a positive trend, encourage players to leave feedback. Use this data to improve game features and address any concerns. Games with higher review scores often correlate with better player retention and acquisition through word-of-mouth.

- **Capitalize on eSports Potential**: With the popularity of Multiplayer games, there's potential to develop titles with competitive features tailored for the eSports scene. This could lead to increased visibility, longer game lifecycles, and additional revenue streams through sponsorships and broadcasting rights.

- **Adopt Cross-Platform Playability**: To maximize the ownership and engagement across Free to Play and Paid games, consider designing games with cross-platform capabilities. This inclusivity allows for a broader audience, facilitating community growth and platform-agnostic revenue streams.

- **Invest in RPG and Multiplayer Genres**: The consistent high review scores for RPGs and the strong performance of Multiplayer games in both ownership and revenue suggest a robust market for these genres. Consider developing features that blend RPG storytelling with multiplayer elements to capitalize on these trends.

EXPLORING GAME DATA WITH TF-IDF AND COSINE SIMILARITY
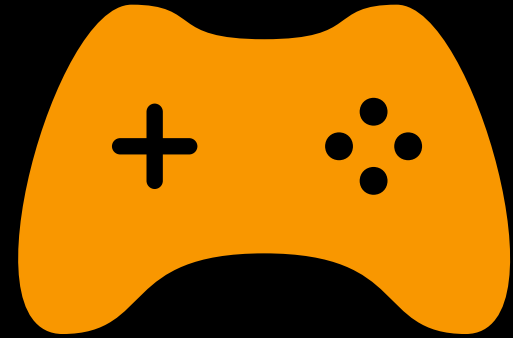
The main objective was to search and display games based on genre similarity using TF-IDF for vectorization and cosine similarity for measuring how close the genres are.

FUNCTIONAL BLOCKS

TF-IDF MATRIX

- Powerful for Content based Filtering

- Vectorizing the 'Tags' column of the dataset to transform the textual data into a format suitable for comparison

SEARCH FUNCTION

- Transforms the input genre to its vector form.

- Computes cosine similarity scores between the query vector and the dataset.

- Sorts the results based on similarity and secondary criteria (Revenue and Reviews).

WIDGETS & EVENT HANDLING

- The Text widgets, and Display widgets allows us to input to type our genre of interest and displays the results in an organized manner

- Event Handling helps in listening to the input changes, and displays the results accordingly

FUTURE OUTLOOK

- **Sustained Interest in Free-to-Play Models**: Given the consistently high number of owners for free-to-play games, this model will likely continue to dominate in terms of attracting a broad player base.

- **Continued Evolution of Battle Royale and Multiplayer Genres**: The rising trend in ownership and review scores for Battle Royale and Multiplayer games suggests they will remain popular, with potential for innovative titles to capture significant market share.

- **Growth Potential for RPGs**: Fluctuations in RPG popularity indicate room for growth, potentially through new immersive experiences or cross-genre innovation.

- **Increased Quality in Paid Games**: The trend toward higher review scores for Paid games could continue as developers aim to justify the purchase with higher-quality experiences.

- **Varied Success in Sports and Racing Genres**: The varied popularity of Sports and Racing games suggests these genres may need to innovate or leverage new technologies like VR to boost player interest.

- **Strategic Opportunities for Strategy Games**: With Strategy games maintaining a solid presence, there's an opportunity for developers to capitalize on this steady interest, possibly exploring new platforms or audiences.

- **Market Dynamics Influencing Genre Popularity**: The changing landscape of game ownership across genres points to the need for adaptability in marketing and development strategies to align with evolving player interests and market trends.

CONCLUSION

This project aims to provide actionable insights into the dynamics of video game genres, leveraging data analytics techniques to uncover trends, patterns, and factors influencing genre preferences among gamers. By addressing the outlined objectives and goals, we anticipate contributing valuable knowledge to industry stakeholders, facilitating informed decision-making, and driving positive outcomes in the ever-evolving gaming landscape.

FUTURE PROJECT ENHANCEMENTS

- **Cross-Platform Performance Comparison**: Compare genre popularity across different gaming platforms to identify platform-specific trends and preferences.

- **Technological Advancements Influence**: Assess how emerging technologies (like AR/VR, cloud gaming) are impacting game genre trends.

- **User Retention Metrics**: Evaluate which genres have higher retention rates over time to understand long-term engagement patterns.

- **Content Creator and Influencer Impact**: Track and quantify the impact of content creators and influencers on game genre popularity.

- **Sentiment Analysis of User Reviews**: Implement sentiment analysis on user-generated reviews to extract deeper insights into player sentiments, preferences, and concerns regarding different game genres.

- **Gameplay Duration Metrics**: Collect and analyze data on total gameplay duration to gain an alternative perspective on game trends, which will help in understanding which genres keep players engaged over time.

THANK YOU