Python Project

How have consumer preferences and industry trends in the video game market evolved over time, and what factors influence the success of video games ?

Achieved using Kaggle datasets from : Howlongtobeat.com, Metacritic.com and Opencritic.com

Author :
GUESSOUS Hicham

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1 Introduction

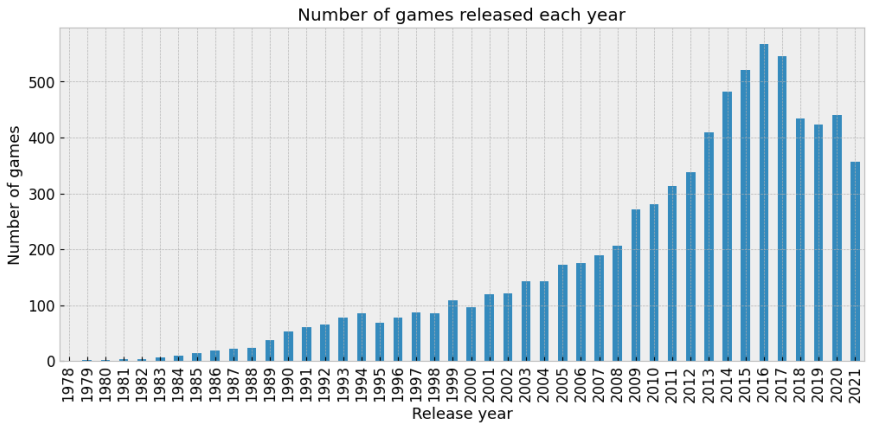

Figure 1: Number of games released by year

With an increasing number of games releasing each year, the global video game industry has transformed from a niche entertainment medium into a 200+ billion cultural and economic powerhouse, driven by technological innovation, shifting consumer behaviors, and evolving market strategies.

Leveraging datasets on player completion times, genre popularity, and platform-specific engagement from 3 different popular video games websites (Howlongtobeat.com, Opencritic.com, and Metacritic.com), we uncover actionable insights into modern gaming preferences and their implications for the industry actors.

The analysis addresses six key questions:

- How has game length evolved, and what is its relationship to player retention?
- Which genres dominate player engagement versus developer output?
- How do platform choices influence commercial success?
- What external factors (e.g., console launches, global events) shape market trends?
- How do genre preferences vary across platforms?
- What strategic lessons emerge about release timing and content design?

By synthesizing these insights, this report provides a roadmap for navigating the competitive and rapidly evolving gaming landscape.

Clarifications

- All the graphs, tables and data utilized in this analysis were created using Python and its libraries on datasets of 60000+ records from 3 different sources. The process involved:

- Data collection and preprocessing to ensure data quality
- Statistical and exploratory analysis with Pandas and Numpy to uncover trends and patterns
- Data visualization leveraging Matplotlib to effectively communicate insights

The complete commented source code is available on my GitHub repository. It demonstrates all the processes stated and serves as a transparent record of the methodology used in this study.

- The data obtained from HowLongToBeat primarily reflects single-player game experiences till year 2021, as the crowdsourced playtimes for multiplayer games can be subjective and less relevant for our analysis. Hence, unless stated otherwise, this study will be focusing on single-player games.

Moreover, to streamline our analysis and enhance accuracy, we'll adopt a simplifying assumption: all players who reported completing the game are presumed to have done so within the same year of the game's release. While this assumption may not capture the nuances of individual player experiences, it provides a consistent baseline for comparative analysis.

- OpenCritic emerged as a response to Metacritic's controversies in the gaming industry, where scores significantly impact a game's financial performance and developer bonuses. Unlike Metacritic's opaque weighted averaging system that favors certain publications, OpenCritic offers transparency with a simple arithmetic mean. This approach addresses industry concerns about the disproportionate influence of review aggregators.

Consequently, when available, OpenCritic scores are preferred over Metacritic for a more equitable and accurate representation of game reviews.

- Genres classification and popular platforms are the ones mentioned on the Howlongtobeat website, to stay as accurate as possible with the dataset.

2 Game length and player engagement

2.1 Historical trends in game length

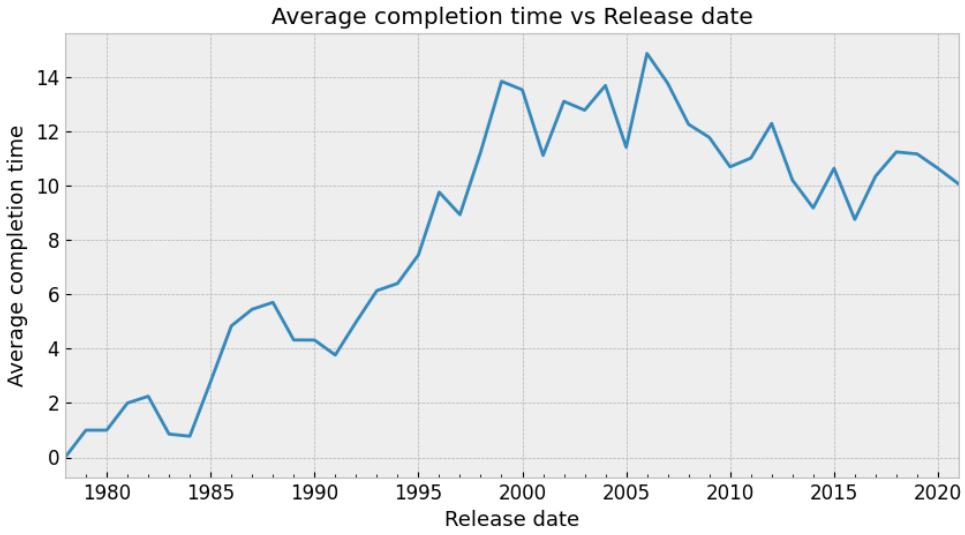

Figure 2: Average completion time vs Release date[1]

The completion time analysis reveals a significant trend in the video game industry since 2010: a steady decline in average game completion times. Modern titles now feature main stories that are approximately 30% shorter compared to pre-2010 releases. This shift raises the question: Are players gravitating more towards shorter games?

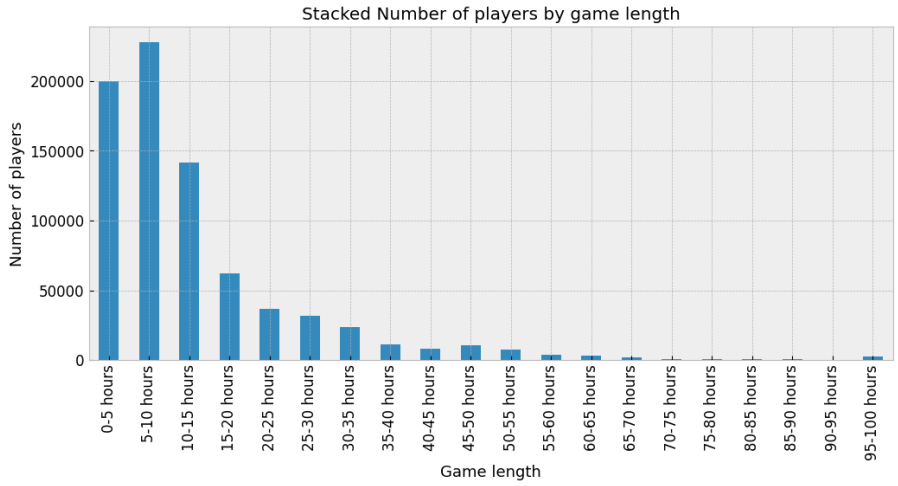

Figure 3: Stacked Number of players by game length

Indeed, player engagement data strongly supports this hypothesis. The majority of players show a clear preference for shorter gaming experiences:

- 55% of players favor games lasting 10 hours or less
- 29.4% opt for titles offering 5-10 hours of gameplay
- 25.6% choose games completable in under 5 hours

2.2 Platform-Specific Preferences

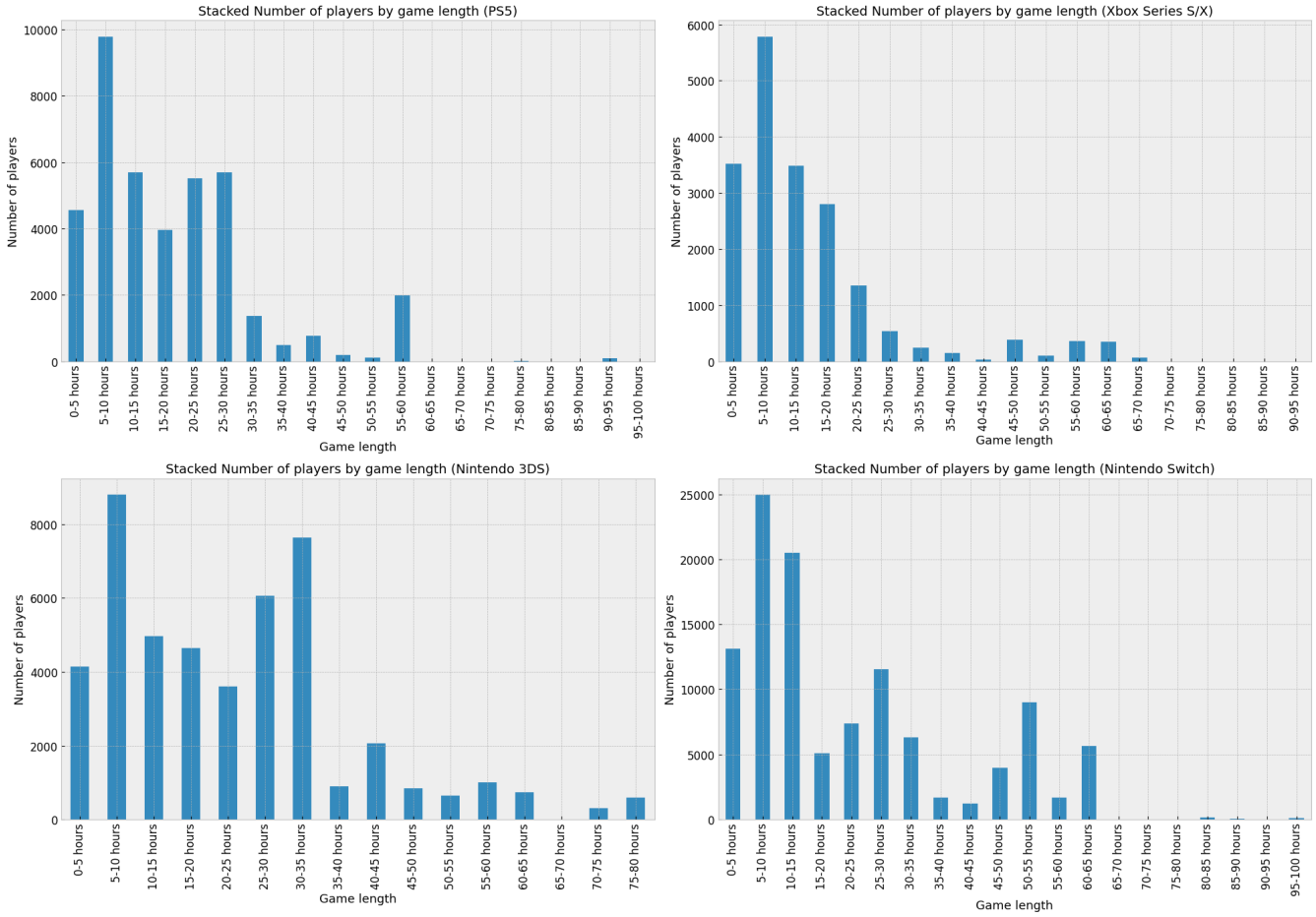

Figure 4: Stacked Number of players by game length

While the overall trend favors shorter games, engagement patterns vary across platforms:

- **Universal "Sweet Spot":** The 5-10 hour gameplay duration remains a consistent engagement peak across all platforms, indicating a widespread preference for games completable within this timeframe.

- **Handheld Platform Nuances:** Handheld devices exhibit a unique pattern of extended player engagement:

  - More dispersed playtime distribution in the 15-35 hour range
  - Higher engagement peaks in the 25-30 and 30-35 hour brackets

This suggests that handheld users are more likely to engage with longer games, possibly due to the versatility of these devices in accommodating both quick and extended play sessions during travel or commutes.

2.3 Game score influence

These findings might naturally lead to the assumption that these titles generally receive significantly better scores, driving player engagement. However, a closer examination of average scores versus game length reveals a more nuanced picture. There is no clear correlation between game duration and review scores. In fact, shorter games in the 0-5 and 5-10 hour ranges tend to receive slightly lower scores compared to their longer counterparts. This counterintuitive finding challenges the notion that brevity alone is a key factor in game quality or player satisfaction.

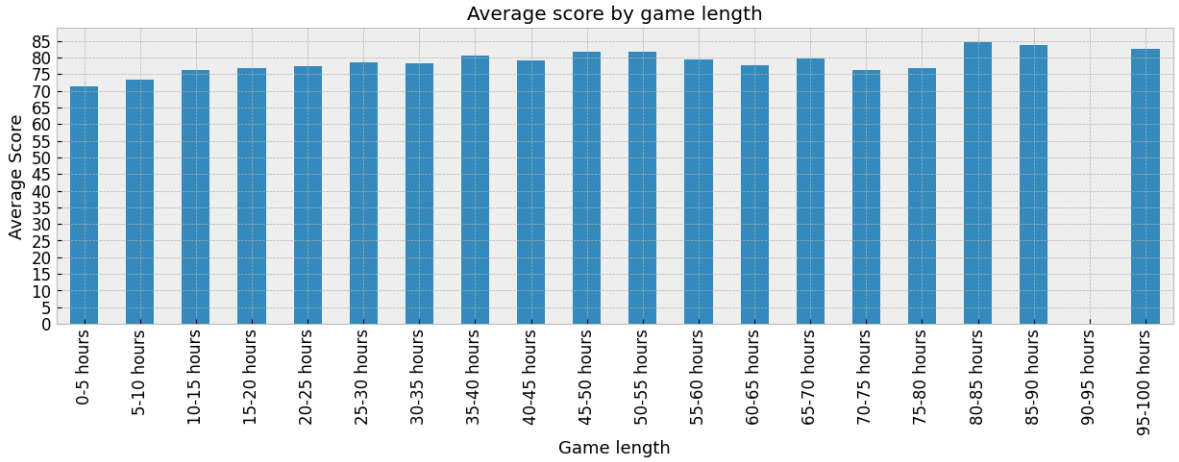

Figure 5: Stacked Number of players by game length

2.4 Final insights

The comprehensive analysis of all the previous presented data strongly indicates a paradigm shift in the video game industry. There is a clear trend towards more concise, focused gaming experiences, with a majority of players showing a marked preference for titles that can be completed within 10 hours or less. This evolution in player preferences appears to be closely aligned with contemporary lifestyle changes and the rising dominance of mobile and handheld gaming platforms in the market.

However, the data also reveals nuanced engagement patterns across different platforms. While the 5-10 hour "sweet spot" remains universally popular, handheld platforms show a unique capacity to engage players for longer durations.

These insights suggest a two-pronged approach:

- Focus on creating concise, high-quality experiences that respect players' time constraints for broad market appeal
- For handheld platforms, consider developing games with extended content or replayability to capitalize on the unique usage patterns of these devices

3 Genre popularity and Developer strategies

3.1 Dominant genres and Market share

While game length plays a crucial role in player engagement, genre preferences also significantly influence market dynamics.

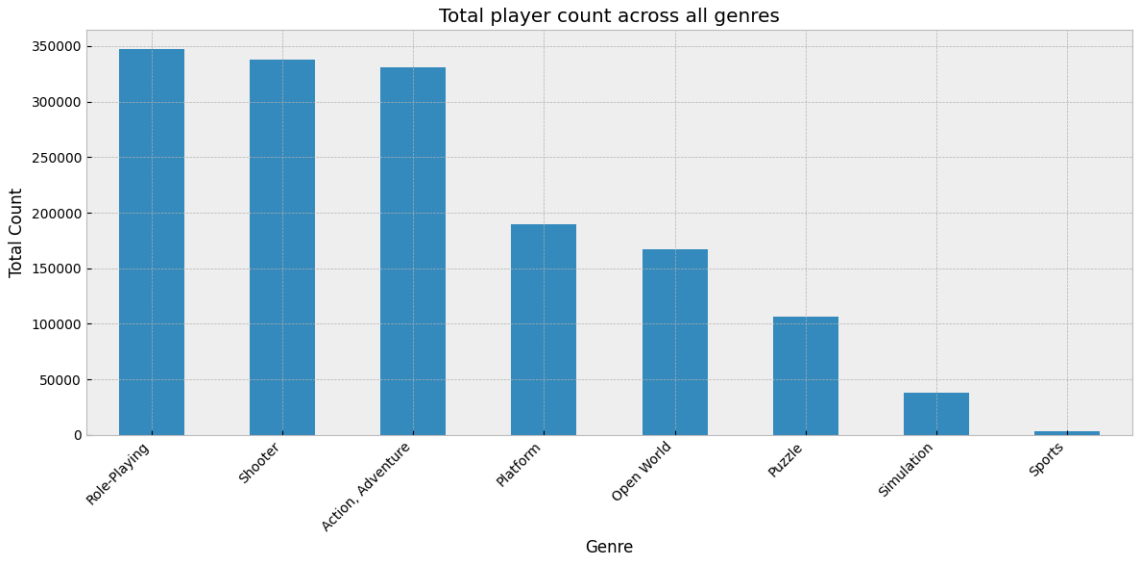

Figure 6: Total player count for most popular genres

Role-Playing, Shooter, and Action-Adventure genres dominate player engagement, collectively accounting for 67% of total playtime.

However, this player preference isn't directly mirrored in the market's output. Over time, Shooter and Action-Adventure games have ceded ground to Puzzle and Simulation genres, which claimed the first and third positions respectively in terms of quantity released in 2021.

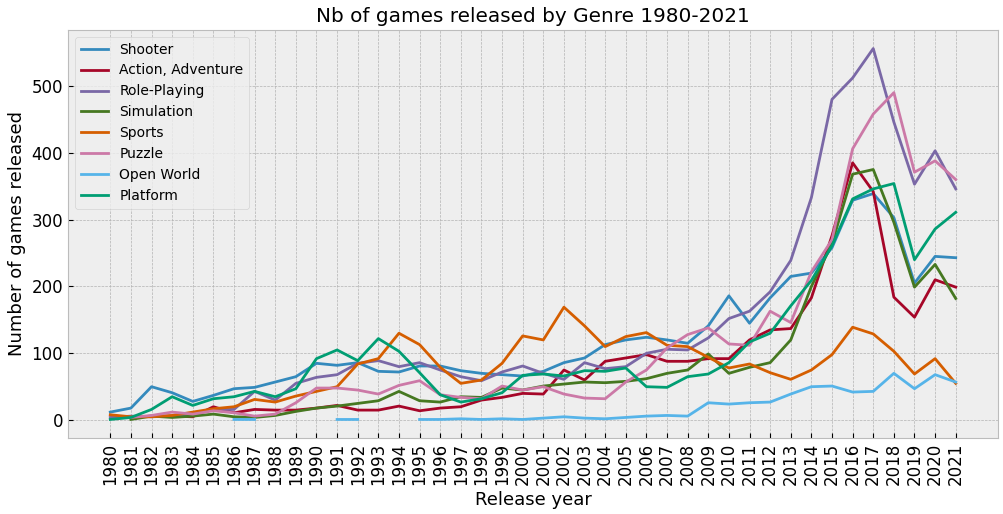

Figure 7: Number of games released by genre by year

Notably, Puzzle games have maintained their leading position in release numbers up to the present day.

Figure 8: Games released for the last 365 days (as of Feb 25 2025) by Subgenre (Source: vginsights.com)

Surprisingly, this trend does not translate to player engagement:

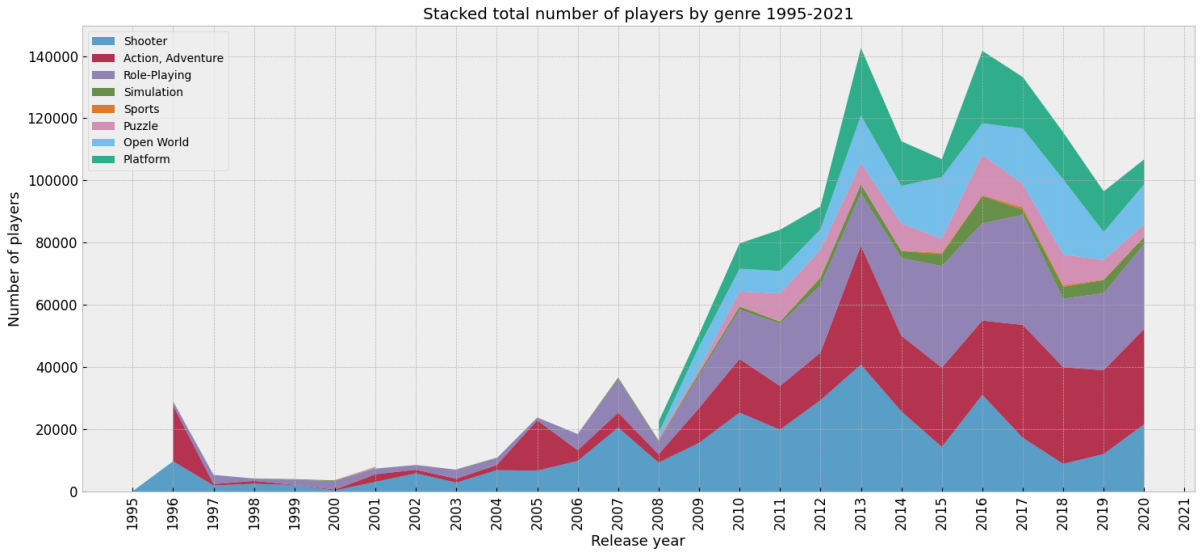

Figure 9: Steam Genre Supply-Demand for the last 365 days by Subgenre (Source: vginsights.com)

- **Shooter:** Player engagement significantly grew from 2005 to 2012. However, its share stabilized post-2013
- **Action-Adventure:** Player engagement never decreased and maintained consistend growth throughout the timeline, becoming the dominant genre in 2021
- **Role-Playing:** They have seen steady growth, particularly after 2008. Pushing the genre at the 2nd highest place in player engagement
- **Puzzle:** Maintained a smaller but consistent share throughout the timeline
- **Open-world:** Grew and maintained a significant player count, while being the genre with the lowest volume of releases

2021 Rank	Game volume	Player engagement market share
1st	Puzzle	Action Adventure
2nd	Role-Playing	Role-Playing
3rd	Platform	Shooter

Table 1: Comparison of 2021 ranks for Volume of games released vs Player engagement market share

A closer look finally reveals a surprising disconnect: game release volumes and player engagement across genres follow diverging trends. This highlights that factors beyond genre popularity influence the industry, painting a more complex picture of the relationship between game production and player behavior.

3.2 Economic Realities and Genre Viability

A further examination reveals two key factors behind these opposing trends. Firstly, a supply-demand imbalance exists where a small number of high-budget titles capture disproportionate player engagement.

Table 2: Top 10 Games by Player count

Name	Player count	Genre
The Witcher 3: Wild Hunt	9500	Action, Open World, Role-Playing
Tomb Raider	9000	Action, Adventure, Platform, Shooter
The Legend of Zelda: Breath of the Wild	7800	Action, Adventure, Open World
Portal	7700	Platform, Puzzle
BioShock Infinite	6800	Action, Shooter
Portal 2	6200	Platform, Puzzle
Persona 5	6000	Role-Playing, Simulation
God of War	5900	Action, Adventure, Hack and Slash
Grand Theft Auto V	5800	Action, Open World, Racing/Driving, Shooter
BioShock	5600	Action, Horror, Shooter

Secondly the economic realities of game development further complicate this landscape. Open-world games exemplify the high-risk, high-reward paradigm: they require 3–5x the development budget of puzzle games but generate 10–15x the revenue due to premium pricing and DLC opportunities.

Conversely, puzzle games thrive on low production costs and high player engagement. Moreover, microtransaction models, as seen in titles like Candy Crush Saga, sustain profitability through iterative updates rather than upfront sales.

3.3 Platform-Genre Synergies

Table 3: Player count genre distribution by Platform

Platform/Genre	Shooter	Action, Adventure	Role-Playing	Simulation	Sports	Puzzle	Open World	Platform
Nintendo 3DS	602	7895	19859	900	217	4047	270	5751
Nintendo Switch	2892	22399	38504	2308	1211	4754	9821	29523
PC	210238	150558	179930	23290	1237	78507	81379	98053
PlayStation 3	25259	24184	15096	1372	73	2194	7898	10782
PlayStation 4	48434	77980	59288	8388	582	7167	38017	23561
PlayStation 5	7071	18908	10582	492	48	2678	11328	6811
Wii U	842	3877	1440	–	24	717	1803	4367
Xbox 360	20908	8928	9632	277	175	1066	5874	3077
Xbox One	16644	12053	8963	523	116	3471	8173	6060
Xbox Series X/S	4553	3917	3732	330	54	1997	2504	1900

These genre preferences don't only exist in isolation but are also closely tied to specific platforms. Data from Table 3 reveals stark platform-specific preferences:

- Nintendo Switch: Dominated by RPGs (26% of players) and platformers (35%)
- PC: Dominated by the shooter genre, claiming 26% of engagement, and leveraging mouse/keyboard precision
- PlayStation/Xbox: Action-adventure and shooters account for 60% of playtime, aligned with core console demographics

These trends influence cross-platform porting strategies, where genre suitability often takes precedence over universal cross-platform versions. Although this is less and less of an issue with the emergence of portable hybrid platforms such as the Nintendo Switch or Steam Deck

3.4 Final insights

In conclusion, it is clear that the video game market exhibits a nuanced landscape shaped by the intricate interplay of genre preferences, platform ecosystems, and economic realities. Hence, several key insights emerge from our analysis:

- **Supply-Demand Imbalance:** A significant disparity exists between player engagement and game releases across genres. Action-adventure and RPGs dominate player attention but represent a smaller portion of releases, highlighting the outsized impact of high-budget, quality titles

- **Economic Stratification:** The industry is characterized by a high-risk, high-reward paradigm, particularly evident in open-world games. These titles require substantial investment but offer potential for premium pricing and extended monetization through DLC, contrasting sharply with the economics of puzzle and casual games

  On the other hand, puzzle and casual games thrive on a unique economic model. Their low development costs, combined with revenue streams driven by microtransactions, facilitate ongoing profitability through incremental updates. This approach explains the remarkably high quantity of releases in these genres, as developers can rapidly iterate and frequently launch new titles or content updates

- **Platform-Specific Ecosystems:** Each gaming platform –with a slight exception for PC– cultivates a unique genre ecosystem, tailored to its hardware capabilities and target demographic. This specialization informs development and marketing strategies, emphasizing the importance of platform-specific approaches over universal releases

These findings underscore the complexity of the video game market, where success hinges on a delicate balance of creative vision, technological capabilities, and astute business strategy.

4 Release timing and External influences

4.1 Yearly release-strategy

Beyond game length and genre, the timing of a game's release can significantly impact its success.

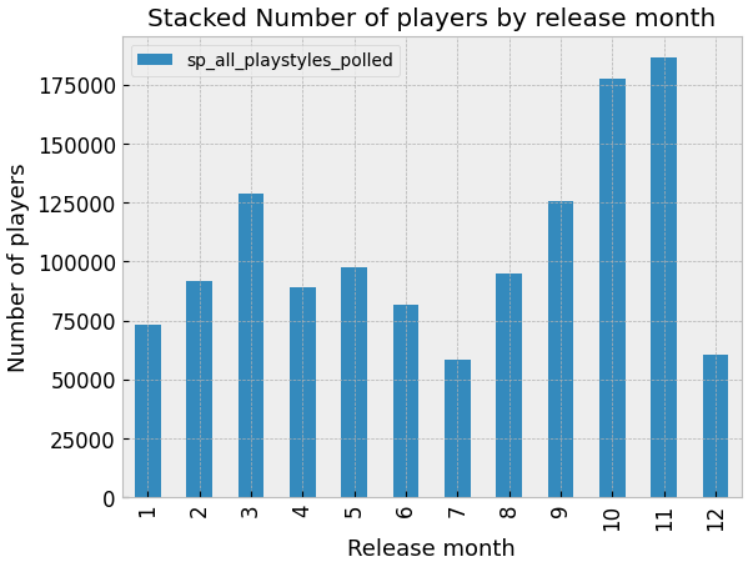

Figure 10: Game popularity by release month

Figure 10 reveals a notable surge in player engagement for games released in October and November. This uptick can be attributed to two key factors:

- **Holiday Gift-Giving:**
  - Video games are popular holiday gifts, especially for children. In the US, 76% of kids aged 10-17 plan to ask for video games as gifts, outpacing other categories like money and clothes.
  - The gift-giving season often results in a substantial increase in new gaming device adoption. For example, consoles like Xbox Series X and PlayStation 5 have been among the most purchased items during Black Friday and Cyber Monday sales.
- **Increased Leisure Time:**
  - Winter weather tends to keep people indoors, leading to more time for indoor activities like gaming
  - The holiday period often sees an increase in gaming activity, with Christmas Eve and New Year's Eve showing significant spikes in player numbers and session lengths

March emerges as a significant secondary peak for game releases, defying the conventional holiday-centric launch schedule. This trend appears anomalous, as no apparent consumer behavior seems to justify a March-focused release strategy. The phenomenon warrants deeper investigation to understand its underlying causes and implications for the gaming industry. Given the limitations of our initial dataset, we expanded our research to include external sources, seeking a more comprehensive understanding of this unexpected pattern.

Table 4: Top 10 games released in March by Player count

Name	Player count	Month
Tomb Raider	9,000	3
The Legend of Zelda: Breath of the Wild	7,800	3
BioShock Infinite	6,800	3
Ori and the Blind Forest: Definitive Edition	4,000	3
Yakuza 0	3,400	3
South Park: The Stick of Truth	3,200	3
Sekiro: Shadows Die Twice	2,800	3
Journey	2,700	3
Bloodborne	2,700	3
Ori and the Will of the Wisps	2,600	3

If we analyze the most played games released in March and look for release date disruptions for these games, an interesting pattern emerges. BioShock Infinite, Tomb Raider (2013 version), and Ori and the Blind Forest: Definitive Edition were all originally planned for release before the holiday season but were delayed to spring due to development needs.

Additionally, The Legend of Zelda: Breath of the Wild launched alongside the Nintendo Switch on March 3, 2017. Together, these games account for a total player count of 27,600.

Excluding this number from Figure 9 would bring engagement levels for March releases down to similar levels as other months. This suggests that the observed player engagement spike in March is largely coincidental and not indicative of a broader trend.

We now know that players are more engaged in games releasing before the end-of-year holiday period, however, is there right timing for releasing specific genre games ?

4.2 Genre-specific release-strategy

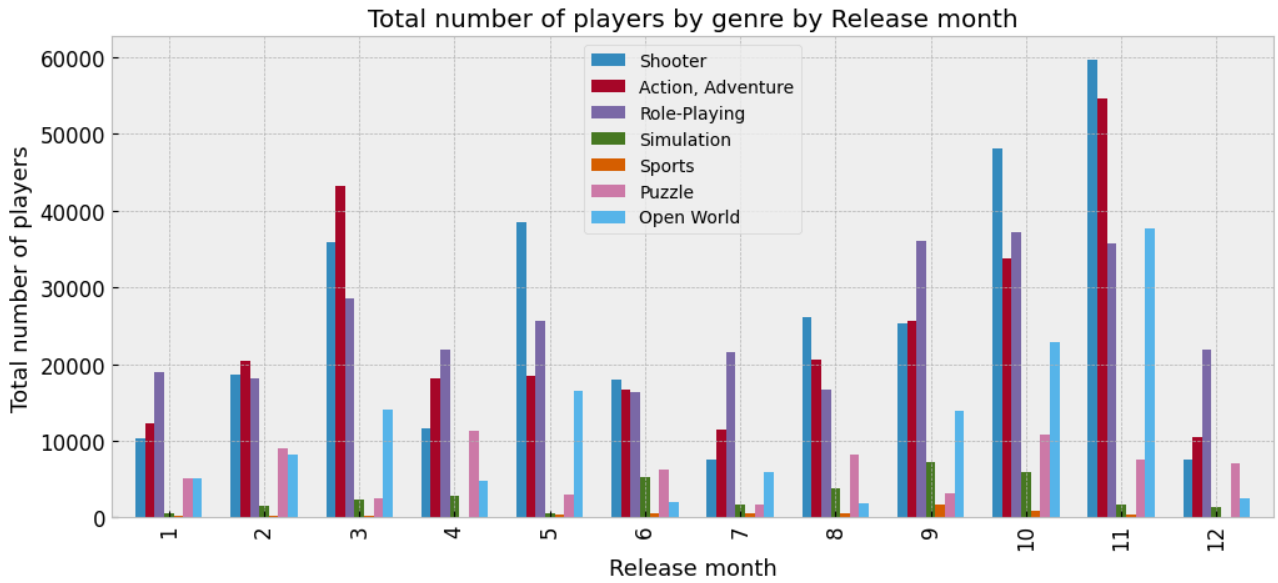

Figure 11: Game popularity by release month

Figure 11 reveals that general player engagement trends observed in Figure 10 are largely consistent for Shooter, Role-Playing, Action-Adventure, Open World, and Simulation games. These genres exhibit pronounced engagement spikes towards the end of the year.

In contrast, Sports and Puzzle games demonstrate consistent player engagement throughout the year, with minimal seasonal fluctuations. This suggests that these genres maintain a steady player base regardless of release timing.

These insights indicate that for most game genres, an end-of-year release strategy may be optimal to capitalize on peak engagement periods. However, Sports and Puzzle games appear less sensitive to release timing, potentially offering developers more flexibility in their launch schedules.

4.3 Final Insights

Based on the comprehensive analysis of game release months, player engagement patterns, and genre-specific trends, several key insights emerge for game developers and publishers. These insights can guide strategic decision-making in the competitive video game market:

- **Holiday Season Advantage:** Releasing games in October and November is optimal for most genres, capitalizing on holiday gift-giving and increased leisure time during winter months.
- **Genre-Specific Timing:** Shooter, Role-Playing, Action-Adventure, Open World, and Simulation games strongly benefit from end-of-year releases. While Sports and Puzzle games show consistent engagement year-round, allowing for more flexible release schedules.
- **Strategic Delays:** Delays from the holiday season can be are still successful for highly anticipated titles or those coinciding with new hardware launches.
- **Market Saturation Consideration:** While end-of-year releases are generally beneficial, increased competition during this period necessitates strong marketing strategies. Hence, developers must balance the benefits of holiday season releases against the challenges of standing out in a crowded market.

5 Conclusion

The comprehensive analysis of the video game industry reveals a complex and dynamic landscape shaped by evolving player preferences, technological advancements, and market forces. Key insights from this study include:

Game Length and Player Engagement

- A trend towards shorter games, with most players preferring experiences of 10 hours or less.
- Platform-specific nuances, particularly for handheld devices, which show higher engagement with longer games.
- No direct correlation between game length and review scores, challenging assumptions about quality and duration.

Genre Popularity and Developer Strategies

- Dominance of Role-Playing, Shooter, and Action-Adventure genres in player engagement.
- A mismatch between player preferences and market output, with Puzzle and Simulation games overrepresented in releases.
- Economic stratification between high-budget, high-reward titles and more numerous, lower-cost productions.
- Platform-specific genre ecosystems influencing development and marketing strategies.

Release Timing and External Influences

- Strong player engagement for games released in October and November, capitalizing on holiday gift-giving and increased leisure time.
- Genre-specific timing considerations, with most benefiting from end-of-year releases while some (e.g., Sports, Puzzle) show year-round consistency.
- The impact of strategic delays and hardware launches on release schedules.

These findings underscore the importance of a nuanced approach to game development and publishing. Success in the modern gaming industry requires careful consideration of game length, genre selection, platform targeting, and release timing. Developers and publishers must balance creative vision with market demands while remaining adaptable to technological shifts and changing consumer behaviors.

As the industry continues to evolve, staying attuned to these trends will be crucial for navigating the competitive landscape and creating experiences that resonate with players across diverse platforms and preferences.

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