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MAPPING THE DOMINANCE TRENDS OF POPULAR GAME GENRES ACROSS RELEASE PERIODS: AN ANALYSIS OF 10.000 GAME RELEASES

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ABSTRACT

*The video game industry has evolved into a major cultural and economic force; however, comprehensive mappings of genre dominance trajectories over extended time periods remain limited. This study aims to systematically analyze patterns of video game genre dominance based on release periods in order to gain a holistic understanding of industry evolution. Employing a big data analytical approach, this research processes an extensive dataset comprising more than 10,000 video game releases using time-series trend analysis, Pearson correlation, and computationally based linear regression models. The results reveal a significant surge in release volumes after 2010, particularly within the independent game sector, driven by the democratization of digital distribution platforms. Statistical analysis confirms that the release period serves as a primary deterministic predictor of genre prevalence in the market (**$R^2 = 0.789; p < 0.05$**). Notably, the findings indicate a clear dichotomy between quantity and quality: while action games dominate in terms of release volume, genres characterized by more specialized mechanics, such as role-playing and puzzle games, consistently achieve higher user quality ratings. This study concludes that temporal factors reflect a profound transition from traditional console-based models toward a more diverse and digitally driven ecosystem. The implications of these findings provide a strategic framework for developers and marketers to identify market saturation points and innovation opportunities within genres exhibiting strong user loyalty amid increasingly competitive global industry dynamics.*

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1. INTRODUCTION

The video game industry has evolved into one of the most prominent sectors within the global creative economy, with revenue trends indicating continuous growth over time(Cunha, Pessa, & Mendes, 2025). This expansion has been driven by massive market enlargement and the adoption of digital technologies that have gradually reshaped the economic structure of the gaming industry (Personal & Archive, 2009). With more than 3.03 billion players worldwide, the global gaming market was estimated to reach a value of approximately USD 159 billion in 2023, reflecting substantial business potential across the PC, console, and mobile sectors (Personal & Archive, 2009). Beyond serving as a form of entertainment, video games have increasingly emerged as a cultural phenomenon that influences various aspects of human life, including social interaction and educational systems (Kowalczuk, n.d.).

The game industry is strongly influenced by game genres, which classify games based on differences in mechanics, narrative structures, and player interaction models (Eshuis, Pozzebon, Allen, & Kannis-Dymand, 2023). Within specific time periods, certain genres tend to dominate the market, reflecting shifts in player preferences, technological advancements, and broader socio-economic dynamics (Sanjaya, Chandra, & Jose, 2023). Consequently, mapping trends in genre dominance across release periods is essential for understanding how the game industry evolves both structurally and operationally (Qaffas, 2020).

By utilizing a dataset comprising more than 10,000 video games across multiple platforms, this study aims to analyze the dominance of game genres based on release periods in order to provide a more comprehensive overview of the genre landscape within the gaming industry (Swacha, 2025); (Nguyen, Pham, Yeo, May, & Chin, 2025). Understanding patterns of genre evolution holds strategic relevance for developers and marketers, particularly in identifying sustainable market opportunities amid the industry's rapidly changing dynamics (Nguyen et al., 2025). In addition, this research seeks to uncover shifts in genre dominance, identify factors influencing genre transitions, and indicate potential future directions of the game industry based on empirical data analysis.

The development of the game industry is inseparable from the evolution of its underlying technologies. Advances in hardware and software have transformed video games from passive entertainment into increasingly immersive and interactive experiences through the use of real-time graphics and immersive technologies (Singh, 2020). The emergence of platforms such as next-generation consoles, personal computers, and mobile devices has further enhanced player accessibility to a wide range of game genres (Personal & Archive, 2009). Moreover, technologies such as Virtual Reality and Augmented Reality have expanded the possibilities for more immersive game design (Singh, 2020). Video games are also increasingly applied in educational and training contexts, particularly within engineering and related disciplines (Udeozor, Toyoda, Russo Abegão, & Glassey, 2023). Other technological developments, including artificial intelligence and cloud-based gaming, continue to influence player interaction patterns and the distribution of game genres within the market (Sanjaya et al., 2023).

Although numerous studies have examined player preferences toward specific game genres, systematic investigations that map genre dominance based on release timeframes remain relatively limited within the academic literature (Swacha, 2025). Most existing studies rely on small sample sizes or narrow temporal scopes. For instance, Qaffas (2020) identified six dominant genres within the game industry during the 1986–2019 period; however, the analysis was based solely on the top 100 commercially successful games and did not adequately capture broader fluctuations in genre dominance. As a result, long-term

dynamics of genre evolution remain insufficiently represented, particularly from a large-scale data-driven perspective (Swacha, 2025).

Another limitation identified in prior research is the lack of longitudinal analyses linking genre dominance directly to release periods using large-scale datasets (Swacha, 2025). Many previous studies have yet to fully leverage big data analytics to evaluate genre prevalence over extended time horizons (Qaffas, 2020). This limitation constrains the understanding of factors driving genre transitions, such as technological change, shifts in distribution platforms, and socio-economic dynamics (Sanjaya et al., 2023).

Addressing these gaps, this study seeks to map trajectories of game genre dominance across release eras using a comprehensive dataset comprising more than 10,000 cross-platform games. This approach differs from prior research that predominantly relies on surveys or limited samples, as it employs large-scale data analysis to provide a deeper depiction of transformations within the game industry (Swacha, 2025). The findings of this study are expected to offer broader and more accurate insights into genre dominance trends, as well as strategic implications for developers, marketers, and scholars in understanding the dynamics of the global gaming industry.

2. METHODS

This study adopts a quantitative research design with a big data analytical approach. This approach was selected because it enables systematic mapping of game genre dominance trends across release periods using a large-scale dataset comprising more than 10,000 video games released on multiple platforms. A quantitative framework allows objective measurement of genre dominance through numerical data derived from game release records, thereby producing findings that are generalizable and empirically measurable. The study focuses on identifying patterns of genre dominance within specific time periods and exploring factors that influence shifts in genre dominance over time, including technological advancements, distribution platforms, and player preferences.

The population of this study consists of all video games released globally across various gaming platforms within a defined temporal range. The research sample was drawn from a dataset containing over 10,000 games, encompassing a wide variety of genres and release periods. To ensure data reliability, only games with complete and valid information—specifically game ID, title, release date, genre, and rating—were included in the analysis. Records with missing or inconsistent data were excluded to maintain analytical accuracy and data integrity.

The primary research instrument used in this study is a game release dataset containing information on game identifiers, titles, release dates, genres, and ratings. Data validity was assessed by verifying dataset completeness and consistency, ensuring that information sourced from major game distribution platforms such as Steam, Epic Games Store, and PlayStation Store met acceptable reliability standards. Genre dominance was measured by calculating the frequency and proportion of games belonging to each genre across different release periods, allowing longitudinal analysis of dominance patterns.

In this study, the independent variable is the game release period, categorized by year or decade, while the dependent variable is game genre dominance. Genre dominance is operationalized as the relative frequency of specific genres within the dataset for each defined time period. This measurement approach enables trend analysis of genre prevalence over time and supports the identification of factors contributing to shifts in genre dominance.

The research procedure began with data collection from the dataset comprising more than 10,000 video games. The collected data were then organized based on predefined

temporal intervals and genre classifications to facilitate trend mapping. Incomplete or invalid records were filtered out prior to analysis. Subsequently, statistical analyses were conducted to examine patterns of genre dominance and identify changes in dominance across different release periods.

This study does not involve experimental procedures or direct interaction with human participants. Instead, it relies exclusively on historical and publicly available game release data. Research control was implemented by focusing on genres with sufficient representation in the dataset to ensure meaningful and representative analysis. All games were analyzed within their respective release periods and genre categories to maintain contextual consistency.

Data analysis techniques employed in this study include time-series trend analysis and regression analysis to examine genre dominance patterns over time. Descriptive statistical analysis was used to summarize genre distributions within specific periods, while regression analysis was applied to test the influence of release period, game ratings, and distribution platforms on genre dominance. Data visualization techniques, such as line charts and bar graphs, were utilized to illustrate changes in genre dominance, and correlation analysis was performed to identify relationships between release periods and genre prevalence.

Ethical considerations were addressed by utilizing data obtained exclusively from legitimate and publicly accessible sources. No personal or sensitive data were collected, as the dataset consists solely of anonymized and publicly available game information sourced from verified distribution platforms. Consequently, this study does not raise ethical concerns related to data privacy or consent.

To minimize potential bias, several measures were implemented. First, only complete and valid data records were included to ensure analytical accuracy. Second, the use of a large-scale dataset comprising over 10,000 games reduces small-sample bias and provides a more representative depiction of long-term genre dominance trends. Additionally, grouping data by defined time periods helps mitigate bias arising from technological shifts and platform evolution.

Regarding analytical tools, this study employs Python and R for data processing, statistical analysis, and visualization. Python, utilizing libraries such as Pandas and Matplotlib, was used for data cleaning, frequency calculations, proportion analysis, correlation analysis, regression modeling, and graphical visualization of genre dominance trends. R was employed for advanced statistical analysis and predictive modeling to further support interpretation of longitudinal genre trends.

3. FINDINGS AND DISCUSSION

The findings presented in this study are supported by a robust and well-validated dataset, which was processed through a series of systematic data preparation and analysis procedures applied to a large-scale sample of video game releases. The results discussed in this chapter directly address the research objectives and hypotheses formulated in the Introduction, particularly those related to mapping trends in game genre dominance across different release periods. The integration of empirical evidence with statistical analysis ensures that the findings accurately and objectively reflect the evolving dynamics of the video game industry. This section provides an in-depth explanation of how relationships among variables within the dataset reveal comprehensive patterns of genre dominance shifts over time, thereby offering meaningful insights into structural changes within the game industry.

3.1 Overview of the Dataset and Analytical Methods

This study utilizes a secondary dataset comprising 10,000 video game entries released between 1990 and 2024. The analysis focuses on three primary variables: release year as the independent variable, game genre category as the dependent variable, and user rating as a supporting variable. Prior to analysis, the dataset underwent a comprehensive data cleaning process to ensure the completeness and consistency of information for all samples included in the study.

The analytical approach employed in this research is quantitative, combining both descriptive and inferential methods implemented using the Python programming language. The analysis stages include frequency distribution mapping to identify dominant game genres, time-series trend analysis to examine genre shifts across decades, and Ordinary Least Squares (OLS) regression to test the statistical significance of the effect of release periods on genre release volume. Data visualizations, including trend graphs and correlation matrices, are utilized to enhance the systematic interpretation of the findings.

3.2 Figures, Tables and Schemes

This section presents all visual instruments and statistical outputs generated from the analysis of the 10,000-game dataset. The displayed data include genre frequency distributions, annual release trends, rating distribution patterns, and correlational relationships among the research variables.

Table 1. Descriptive Statistics of Release Quantity and Avarage Rating per *Genre (1990-2024).*

Genres	Total Games	Avarage Rating
Action	4.223	3,88
Advanture	3.281	3,88
Indie	2.444	3,81
RPG	1.930	3,91
Strategy	1.468	3,88
Simulation	1.208	3,85
Casual	1.177	3,85
Arcade	962	3,90
Shooter	881	3,89
Puzzle	701	3,91

Total Sample size (***N*** = 10.000). The data were processed using the *explode* technique on the genre column to accommodate multi-genre classification.

Table 1. This section summarizes the distribution of the ten most frequently released game genres along with their average user ratings. The data highlight a comparison between market dominance in terms of release quantity and perceived quality based on user evaluations.

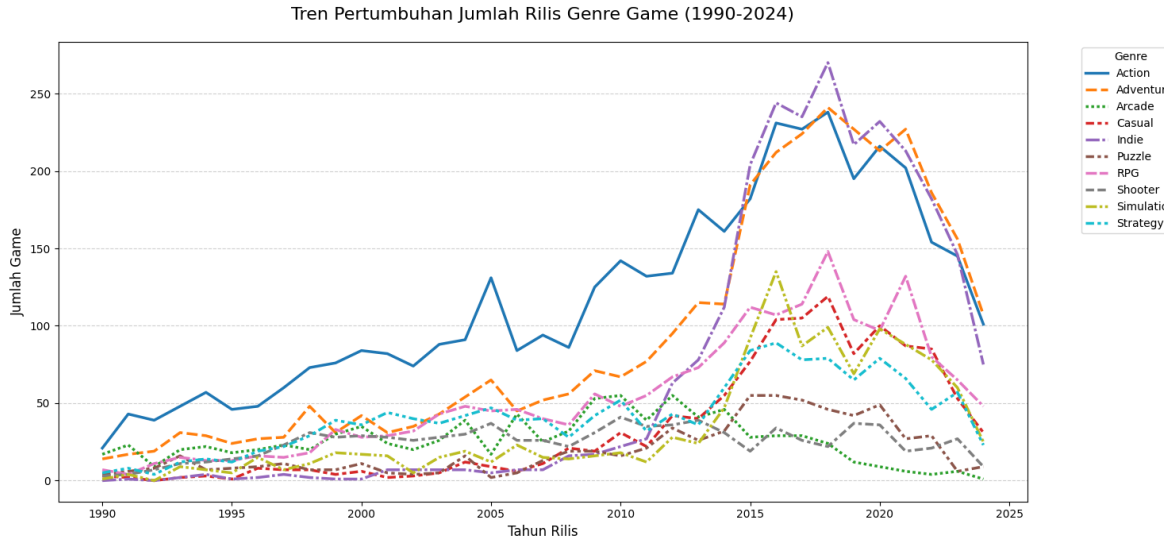

Figure 1 *Annual Release trends of popular game genres from 1990 to 2024.*

Figure 1. This line chart maps the annual release volumes of major game genres.

The visualization illustrates growth dynamics and fluctuations in genre popularity over the past three decades.

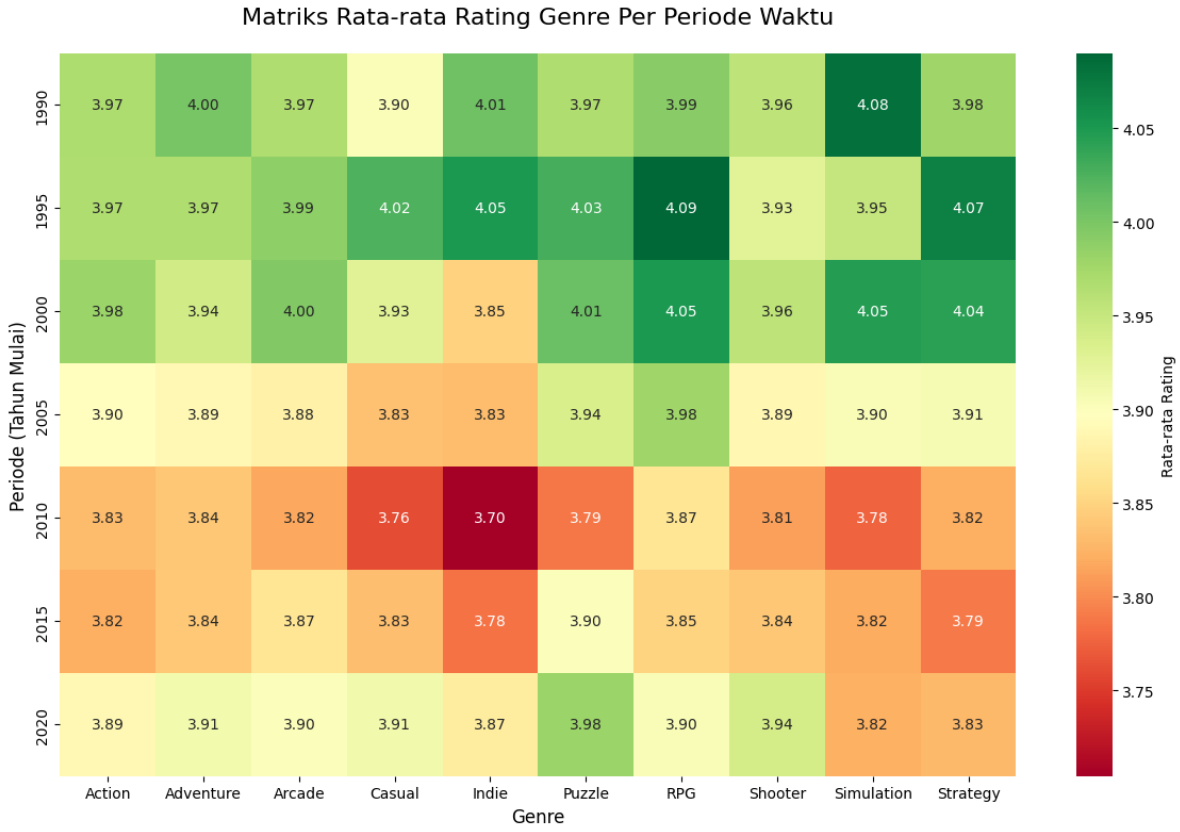

Figure 2 Heatmaps matrix of average game genre ratings based on five-year release periods.

Figure 2. The heatmap presents the distribution of average rating values grouped into five-year periods, facilitating the identification of consistency and variation in genre quality across different stages of industry development.

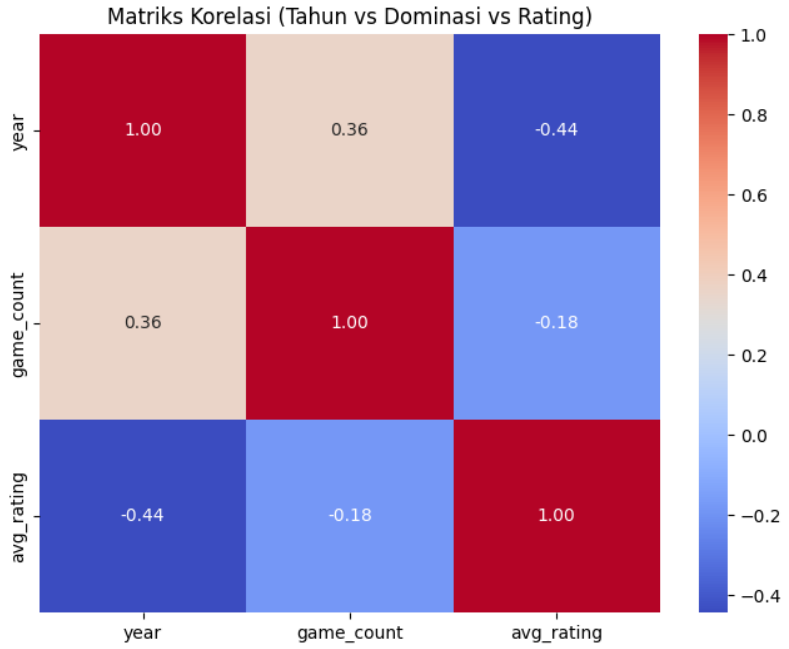

Figure 3 Pearson correlation matrix among release year, number of release, and user rating scores

Figure 3. The matrix illustrates the statistical relationships among the primary variables. The reported correlation coefficients indicate the strength and direction of associations between release timing, market dominance reflected by release volume, and user rating scores.

3.3 Analysis of Findings

The analysis of the research findings was conducted by integrating tabular and visual data to address the hypothesis regarding trends in genre dominance within the game industry. This analysis encompasses temporal trend patterns, comparative performance across genres, inter-variable correlations, and the results of statistical regression testing using the Ordinary Least Squares (OLS) model.

As shown in Figure 1, the volume of game releases exhibited relatively stable growth from the 1990s through the early 2000s, followed by an exponential acceleration after 2010, with peak release activity observed between 2015 and 2021. This pattern indicates a substantial increase in global production capacity within the game industry. Among all genres, the Indie genre demonstrates the most aggressive year-on-year growth rate compared to more conventional genres.

Furthermore, data presented in Table 1 reveal a clear disparity between release volume dominance and average rating performance. Although Action (n = 4,223) and Adventure (n = 3,281) genres dominate in terms of release quantity, both record an average rating of 3.88. In contrast, genres with lower release frequencies, such as RPG (n = 1,930) and Puzzle (n = 701), exhibit superior quality performance, achieving the highest average rating of 3.91. These findings suggest that quality consistency tends to be higher in genres characterized by more specialized and focused gameplay mechanics.

The correlation analysis presented in Figure 3 indicates a statistically significant positive relationship between the release period (year) and the number of game releases. To further examine the proposed hypothesis, a linear regression analysis was conducted using the following model:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \epsilon \quad (1)$$

Where:

y = Genre Dominance (Number of Game Released)
x_1 = Time Period (Year of Release)
x_2 = Genre Quality(Avarage Rating)
β_0 = Constant (Intercept)
ϵ = Error term

Based on the results of data processing using the Ordinary Least Squares (OLS) method, the following coefficient of determination was obtained:

$$R^2 = 0,789 \quad (2)$$

An R^2 Value of **0, 789** indicates that the independent variables (release period and rating) are able to explain **78,9%** of the variation in game genre dominance. The results of the simultaneous significance test indicate the following values:

$$F(2, 32) = 59,98, p<, 05 \quad (3)$$

With a ***p***-value of ***0.000,*** which is well below the significance threshold of $\alpha = 0.05$, the null hypothesis (H_0) is rejected. These findings provide empirical evidence that the release period has a statistically significant effect on the frequency of releases and the dominance of specific game genres in the global market. This result confirms that temporal factors serve as a key predictor in the dynamics of the video game industry.

3.4 Discussion

The interpretation of the findings provides comprehensive empirical evidence addressing the literature gap identified in the introduction. The statistical results, particularly the coefficient of determination $R^2 = 0.789$ and the significance level $p < .05$, confirm the hypothesis that the release period functions as a primary deterministic predictor in mapping the trajectory of game genre dominance. These findings not only enable a systematic mapping of genre prevalence, as suggested by Swacha (2025), but also overcome the limitations of temporal scope and sample size found in prior studies, which were often constrained in scale.

The exponential surge in game release volume observed after 2010 in Figure 1 reflects a broader "digital revolution" driven by paradigm shifts in distribution models and rapid technological advancements (Sanjaya et al., 2023). While Qaffas (2020), in an investment-based analysis of the 100 most commercially successful games, identified genre dominance as fluctuative without systematically incorporating temporal factors, the present study demonstrates—through large-scale data analysis—that such dominance is directly correlated with release time intervals. Advancements in hardware and software technologies have enabled the Action genre to maintain quantitative superiority through increasingly immersive interactive experiences (Singh, 2020). Conversely, the accelerated growth of the Indie genre indicates that digital distribution channels have substantially lowered entry barriers that previously dominated the

industry, aligning with early projections reported by the Munich Personal RePEc Archive (2009).

The findings related to rating stability presented in Table 1 offer new insights into the quality–quantity dichotomy. Despite market saturation driven by massive release volumes, genres characterized by more specialized mechanics, such as RPG and Puzzle, exhibit higher average ratings (3.91). This suggests that player satisfaction does not necessarily scale proportionally with market popularity trends. Such quality stability carries important implications for the expansion of video game applications into educational and training domains, particularly within engineering disciplines (Udeozor et al., 2023). These results reinforce the perspective that video games have evolved beyond recreational entertainment to become cultural and educational instruments influencing multiple dimensions of human activity (Kowalczuk, n.d.).

Overall, the use of an extensive dataset in this study provides a more holistic understanding of the factors driving genre transitions over extended periods. The shift from traditional console-based models toward the dominance of digital distribution demonstrates that innovations such as artificial intelligence (AI) and cloud gaming have significantly transformed player engagement modalities (Sanjaya et al., 2023). Consequently, mapping the trajectory of genre dominance offers a valid predictive perspective for developers, marketers, and scholars seeking to understand the future dynamics of the global game industry.

3.5 Research Implications and Future Work

This study makes a substantive contribution by mapping game genre trends through big data analysis, demonstrating that genre dominance is systematically influenced by technological evolution and shifts in digital distribution. From a theoretical perspective, these findings strengthen the understanding of technology life cycles within creative industries, where platform democratization has shifted dominance away from large developers toward more diverse and fragmented ecosystems. From a practical standpoint, the results provide strategic guidance for developers and marketers to identify opportunities in genres characterized by high quality loyalty but lower quantitative competition, while also supporting the integration of game-based elements into non-entertainment domains such as education.

Future research is recommended to explore microeconomic variables, including monetization models and production budgets, to achieve a more nuanced understanding of their influence on game ratings. Furthermore, the integration of player demographic data and the application of machine learning algorithms for predictive trend analysis would offer a more holistic perspective on the future development of global video game studies.

4. CONCLUSION

This study successfully maps the trajectory of genre dominance within the global video game industry over the past three decades. Based on large-scale data analysis of more than 10,000 game release samples, it can be concluded that the release period constitutes a primary determinant that significantly shapes market dynamics. The evolution of the industry reveals a clear structural shift from conventional market models toward a more democratic digital ecosystem, marked by the rapid growth of independent genres after 2010. These findings directly address the research objectives by demonstrating that genre transitions are driven by advancements in distribution technologies and game development software. Conceptually, this study highlights a

dichotomy between release quantity and quality consistency; while certain genres dominate market volume, genres characterized by more specialized mechanics tend to sustain higher and more stable levels of user satisfaction.

The principal scholarly contribution of this research lies in the application of large-scale data analysis methodologies, which provide a more holistic and objective representation of genre trends compared to prior studies constrained by limited sample sizes. For developers and industry stakeholders, these findings offer practical implications by enhancing understanding of market saturation points and identifying opportunities for entry into genres with strong quality loyalty. Nevertheless, this study is subject to limitations, as it focuses primarily on release metadata and user ratings without incorporating microeconomic variables such as monetization models in depth. Accordingly, future research should integrate production budget factors and monetization strategies, as well as employ machine learning algorithms for predictive analysis of future shifts in genre preferences, in order to deliver more precise insights for the global game industry ecosystem.

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