# Project Rapport

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**Abstract**

This report explores the trends in a dataset about the video game industry. The analysis focuses on global sales, user and critic reviews and market preferences from data spanning 20+ years. By using different visualization techniques and representations its been identified what the dominant genres, top-performing platforms and publishers are along with some mismatches between user and critic ratings. The findings highlight a notable concentration of market power among a few dominant publishers, underscoring their significant influence over the global video game industry. It also shows popularity of different genres through the decades, among the influence of cultural and regional preferences on game sales. This provides an insight into the industry's historical trends and potential future insight into trends.

| Name | Percentage of Contribution |
|---|---|
| Hans Askov | 100 |
| Michael Haugaard Pedersen | 100 |
| Sandra Malling-Larsen | 100 |

# Contents

# 1 Background and Motivation

Video games have become a ubiquitous means of entertainment, both for children and adults, and have the unique ability of offering the user multi-dimensional enrichment by combining the storytelling of books and movies with the interactivity of traditional games and puzzles. Since the release of what is considered to be the first video game in 1958[1], there has been great growth in technology in general, and with it things like televisions and computers have gone from being a luxury to everyday object expected to be present in every home. Along the same line, video games have gone from being limited to big arcade machines to being able to run on most regular computers or smaller home consoles easily kept in a private home.

Due to the evolution in technology, video games have been able to grow from simple pixelated graphics with limited button inputs to high definition photorealistic graphics with multiple forms of interactivity, ranging from button and mouse input, to touch screens, to motion sensor and alternate reality. With this, the audience for video games have also evolved, from being mostly aimed at children and family fun nights, to spanning many genres and all age groups.
This project aims to investigate several aspects of the video game industry as it is today. This is going to be done by looking at: which platforms and publishers command the greatest market shares, which genres consistently top the sales chart, and how critic scores compare to user scores. To do this we analyze a comprehensive dataset of video game sales and Metacritics ratings spanning multiple decades. The report details the data processing methods and presenting a series of visualizations with some having interactive features to report the complex insight into the questions, and concludes by discussing key findings and possible directions.

# 2 Project Objectives

The analysis presented here will explore video game trends and how they have changed over time. Our key areas of interest include **Sales**, **Reviews**, and **Market Preferences**; however, we do not seek to identify a single "most perfect" game. Specifically, we aim to address the following questions:

- **Sales**
  - Which genres consistently lead in global sales, and how large is the gap between them?
  - Who are the top publishers globally, and how do they compare in total sales?
  - How do regional differences (North America, Europe, Japan, and others) shape overall sales distribution?
  - To what extent does a game's ESRB age rating affect its sales?
- **Reviews**
  - How, if at all, are user scores inflated compared to critic scores, and is there a significant bias?
  - In what ways do user and critic ratings differ by platform and genre?
- **Market Preferences**
  - Which platforms command the greatest market share over the analyzed period?
  - Do certain genres or publishers experience particular success on different platforms?

**We will investigate these questions by analyzing** a comprehensive dataset of video game sales and Metacritic scores spanning several decades. Our goal is to uncover patterns, outliers, and correlations through the use of **data visualizations**—some of which feature interactive elements—to shed light on the current state of the video game industry.

# 3 Data

## 3.1 Where to find Dataset

The dataset, Video Game Sales with Ratings up to 22/12/2016 - can be found on Kaggle.com via the link: Video Game Sales with Ratings

## 3.2 Description

The data set contains 11.563 unique entries, 16.719 total entries, and 16 variables, a summary of which can be seen in Table 1.

| Name of Column | Data Type In Data Set | General Data Type | Null Value % |
|---|---|---|---|
| Name | VARCHAR | Categorical Nominal | 0% |
| Platform | VARCHAR | Categorical Nominal | 0% |
| Year-Of-Release | VARCHAR | Numerical Discrete | 0% |
| Genre | VARCHAR | Categorical Nominal | 0% |
| Publisher | VARCHAR | Categorical Nominal | 0% |
| NA_Sales | Double | Numerical Continuous | 0% |
| EU_Sales | Double | Numerical Continuous | 0% |
| JP_Sales | Double | Numerical Continuous | 0% |
| Other_Sales | Double | Numerical Continuous | 0% |
| Global_Sales | Double | Numerical Continuous | 0% |
| Critic_Score | BIGINT | Numerical Continuous | 51% |
| Critic_Count | BIGINT | Numerical Continuous | 51% |
| User_Score | BIGINT | Numerical Continuous | 54% |
| User_Count | BIGINT | Numerical Continuous | 40% |
| Developer | VARCHAR | Categorical Nominal | 38% |
| Rating | VARCHAR | Categorical Ordinal | 40% |

The Name variable is the title of the video game, Year-Of-Release is when the video game was released, and Platform is the gaming system the game was released to, this includes both traditional console gaming systems, such as the XBOX and PlayStation families, as well as handheld consoles like the Nintendo Game Boy family.
For the last 20+ years, it has become pretty common for the same game title to be released for multiple platforms, eg. PC, XBOX, and Playstation) at the same time, which is why the same title might appear multiple times in the data set, with one entry per platform, leading to the difference between total entries and unique entries.

Genre categorizes the video games into one of 12 types of games; Action, Adventure, Fighting, Misc, Platform, Puzzle, Racing, Role-Playing, Shooter, Simulation, Sports, and Strategy.

Publisher is the name of the company that published the video game, which may or may not be the same company that developed the game. Likewise, the name of the developing company can be found in the Developer column. 38% of the games in the data set do not have a developer listed. This could be

because the information is no longer available, due to companies no longer existing, or that the game was an indie development.

The Rating column contains the age rating the video game has received using the ESRB rating system, with the categories Rating Pending (RP), Kids to Adults(K-A), Everyone (E), Everyone 10+ (E10+), Teen (T), Mature 17+ (M), and Adults Only 18+ (AO), here listed from lowest to highest. In 1998 the rating K-A changed name to E.

The Critic_Score and Critic_Count columns show the aggregate score given by game critics and the number of scores used, respectively. These results were compiled by the staff of Metacritic, a website specializing in collating critic and user scores for various entertainment media. As this dataset spans game releases going back to 1980, there are some games that Metacritic has not been able to combine critic scores for, simply because these critic reviews are not available online.

Similarly, the User_Score and User_Count columns show the average score given to a specific game by Metacritic's user base, and the amount of users that gave a score. As these results are only from Metacritic's subscribers, there is bias in the data set, both due to its incompleteness, but also due to Metacritic's user base not necessarily being representative of the users of the game titles.
Like with the critic scores, there are games that have no user scores, either because the game titles are old, or because the people who played the game aren't users of Metacritic; this can be due to lack of awareness, lack of interest in using the platform, or inability to use due to language barrier.
Additionally, Metacritic does not require any form of check or verification that a user has actually bought or played the game before giving a review score, meaning it is possible to artificially inflate or deflate the user review score.

The NA_Sales, EU_Sales, JP_sales, Other_Sales, and Global_Sales contain the total number of units sold in each region, in millions of units, from the release of a game up to 22/12/2016.
NA_Sales covers North America, EU_Sales covers the European Union, JP_Sales covers Japan, and Other_Sales contains the sales numbers from the rest of the world not covered by the previous three regions, ie. Africa, Asia minus Japan, Australia, Europe excluding the EU, and South America.
It is unclear if, and if yes, how, the dataset accounts for changes in European Union membership status, or if the sales numbers are based on the EU membership list of 22/12/2016.
Lastly, the Global_Sales column contains the sales numbers for a given video game's world wide sales.

## 3.3 Data Processing

Some of the variables have a high null percentage, meaning we are missing certain information for some of the data points. As can be seen in Table 1, this mainly affects the variables User_Count, Critic_Score, Critic_Count, Rating, User_Score, and Developer.
Seeing as rate of null values for the affected variables is so high, and there are questions where this information is relevant, the decision has been made to remove any incomplete data points from the data set. This does massively reduce the number of entries in the data set, from 16.719 total and 11.563 unique entries to 6.825 total and 4.449 unique entries, however, this exclusion allows for cleaner visualizations compared to the alternative.

Another change made to the data set is changing the K-A rating to E, for all affected columns. As described previously, the two ratings are effectively the same, with E replacing K-A. This change in the data set serves two functions; firstly it will allow the visualizations to more accurately depict reality

by having one representation for the same age rating instead of two, and secondly, using only E will eliminate possible confusion for the reader, as most are no longer familiar with the K-A rating name.

# 4 Video Games Sales Analysis Dashboard Documentation

## 4.1 Introduction

The dashboard can be found here Dashboard
The graphs here will mimic the structure of the Dashboard, so that this manual may function as a back-up in case the Dashboard is not available.

## 4.2 Visualization Descriptions

### 4.2.1 Comparative Analysis of Top Publishers and Genres by Global Sales

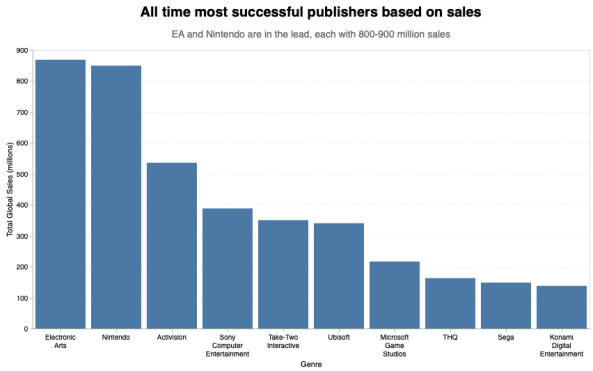


Figure 1: Top 10 Publishers by Global Sales

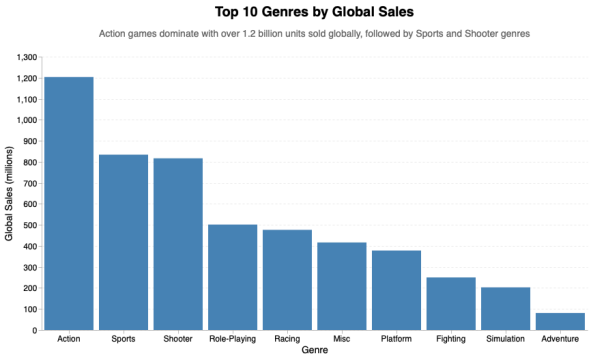


Figure 2: Top 10 Genres by Global Sales

**Analysis of Figure 1 Top 10 Publishers by Global Sales**

The chart highlights the dominance of Electronic Arts (EA) and Nintendo in the global video game market, each achieving over 800 million units sold worldwide. EA leads with approximately 850 million units, closely followed by Nintendo at around 840 million units. Activision secures the third position with approximately 530 million units sold, marking a significant gap from the top two publishers.

Sony, Ubisoft, and Take-Two Interactive occupy middle positions, demonstrating notable but comparatively lower sales figures. Meanwhile, Konami, Sega, and THQ round out the list with sales closer to the 140 million mark. This distribution reflects a strong consolidation of market power within a small group of publishers, with a steep decline in sales figures beyond the top three.

**Chart Design and Methodology**

The bar chart is arranged in descending order to emphasize the ranking and proportional differences among publishers. A zero-baseline ensures accurate comparison of total sales, while strategic axis scaling highlights the disparity between top performers and the remaining publishers. The steelblue color scheme provides a clean and professional aesthetic, focusing viewer attention on the data. Labels are angled for clarity, ensuring readability even with longer publisher names. Gridlines are subtle yet effective in guiding the reader's eye across the dataset.

This visual representation effectively communicates the significant disparities in sales performance, underscoring the concentrated market dominance of leading publishers.

**Analysis of Figure 2 Top 10 Genres by Global Sales**

Action games command an impressive lead with more than 1.2 billion units sold globally. Sports and Shooter genres each hover around 800 million units, indicating their substantial popularity among gamers. Role-Playing and Platform genres follow, contributing significantly to global sales figures.

Simulation, Fighting, and Racing genres occupy mid-tier positions, each with sales ranging between 200 to 400 million units. Puzzle and Miscellaneous genres round out the top ten, reflecting niche markets with dedicated audiences. This distribution showcases the diverse preferences of the gaming community, with a notable concentration in action-oriented genres.

**Chart Design and Methodology**

The bar chart is organized in descending order to facilitate quick identification of the most popular genres. A zero-baseline ensures accurate representation of sales figures, while consistent color schemes maintain visual coherence. Labels are oriented horizontally for ease of reading, and gridlines are employed to guide the viewer's eye across the data.

This design effectively highlights the dominance of certain genres in the gaming industry, providing insights into consumer preferences and market trends.

### 4.2.2 Top Platforms by Average Critic Score and Global Sales Over Time (AI)

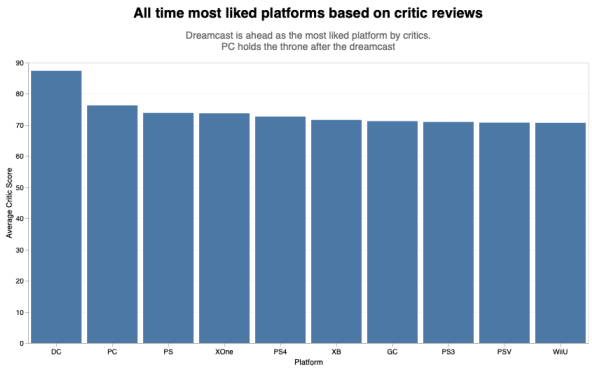


Figure 3: Top Platforms by Average Critic Score

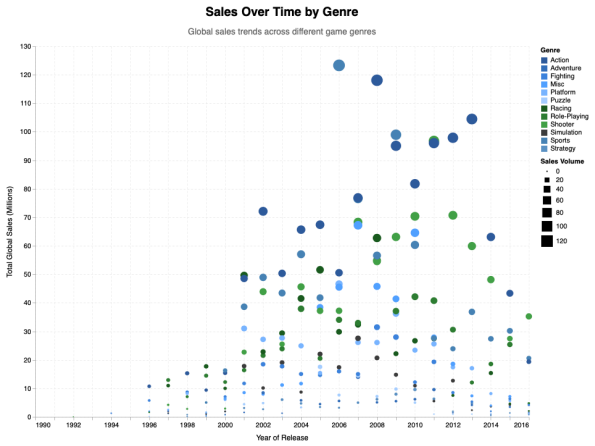


Figure 4: Global Sales Over Time by Genre (AI-Generated)

**Analysis of Figure 3 Top Platforms by Average Critic Score**

When looking at platforms to which at least ten critic-reviewed games have been released, Dreamcast emerges as the standout with the highest overall critic scores. PC follows closely behind, which underlines the deeply held sentiment among some professionals that PC gaming—often hailed for its flexibility in hardware choices and modding community—maintains a high bar for quality. Other platforms exhibit respectable averages, suggesting that well-received titles are not exclusive to a single ecosystem, though they may be diluted by a larger total library that includes critically panned games.

**Chart Design and Methodology**

The bar chart uses a truncated y-axis that does not start at zero but is carefully configured so that subtle score differences between platforms remain visible. Each platform label is rotated at an angle conducive to legibility, preventing overlapping text. The chart is sized at 800×400px so that the largest bars (e.g., Dreamcast and PC) remain clearly dominant, but the mid-range variations do not disappear. Tooltips contain supplementary details such as the exact numeric average and the total number of games that informed each platform's score, ensuring transparency about the sample size.

**Analysis of Figure 4: Global Sales Over Time by Genre**

Spanning 1990 through 2016, this bubble chart reveals both the overarching popularity trajectory of each genre and the fluctuations in sales that occur year to year. Action games usually loom large throughout, signaling unwavering consumer interest, whereas some genres, such as Strategy or

Adventure, occasionally see modest spikes in specific timeframes—indicating moments when fresh titles or technological innovations briefly boosted their visibility.

**Chart Design and Methodology**

Created with ChatGPT's assistance, this scatter plot uses bubble size to encode the total sales for each genre per year, layering a second dimension of data over the positional layout (time on the x-axis, genre on the y-axis). For the full transcript used to generate this graph, please see Appendix
Color is assigned to each genre in a way that satisfies perceptual distinctiveness, avoiding color conflicts, and making it easy to differentiate the categories at a glance. The chart's 800×600px space promotes readability of both larger high-sales bubbles and smaller ones. Interactive tooltips provide the specific year and total sales, helping viewers delve deeper into any notable anomalies or trends.

### 4.2.3 Distribution of Global Sales and User Score vs Critic Score Distribution

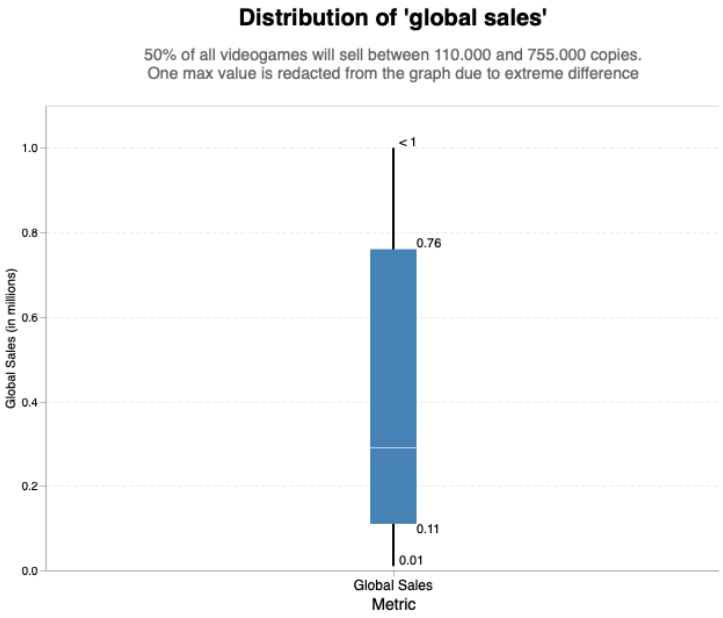


Figure 5: Distribution of Global Sales

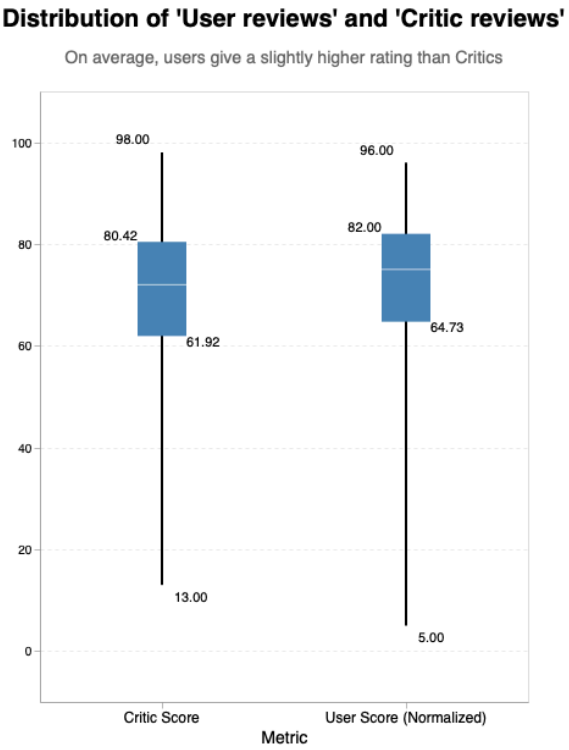


Figure 6: User Score vs Critic Score Distribution

**Analysis of Figure 5 Distribution of Global Sales**

A significant portion—roughly half—of all video games cluster between 110k and 755k units sold, illustrating a fairly modest sales level for the majority of titles. Yet a small cohort skyrockets into tens of millions, with Wii Sports reaching over 82 million copies. This disparity underscores the prevailing phenomenon where select blockbuster games dramatically skew the overall distribution and overshadow the medium-performing bulk of the market.

**Chart Design and Methodology**

A vertical boxplot is used to make quartiles and outlier points immediately visible, focusing on the distribution's shape and concentration. The chart is sized at 600×400px, ensuring space for labeling and whiskers while keeping the main data range readable. The median line is rendered in contrasting white against a steelblue box, making the central tendency easy to spot. Outliers are indicated with specialized symbols or truncated if they exceed a certain threshold ("<1" notation), preventing these extreme cases from compressing the scale and obscuring the distribution of the majority.

**Analysis of Figure 6 User Score vs Critic Score Distribution**

Upon normalizing user scores to a 0-100 scale for direct comparison, we see a tangible drift where the median user score generally hovers slightly above that of critics, yet user ratings exhibit a broader spread from the lower extremes to the highest marks. This variation implies a tendency among consumers to reward personal preference more liberally, or in contrast, harshly penalize certain elements critics might overlook.

**Chart Design and Methodology**

Two parallel boxplots (User vs. Critic) are placed side by side within a 400×500px layout, providing ample vertical space to emphasize differences in score distributions. Different but complementary color schemes designate each category—warm hues for user scores and cooler ones for critic scores—ensuring immediate distinction. As both scores largely occur in the 6–8 range, a non-zero y-axis (e.g., beginning around 5 or 6) enhances resolution for that tighter band. Median lines are intentionally stark (white) to highlight the central metric in each distribution.

### 4.2.4 Top 5 Genres by Global Sales and Global Market Distribution

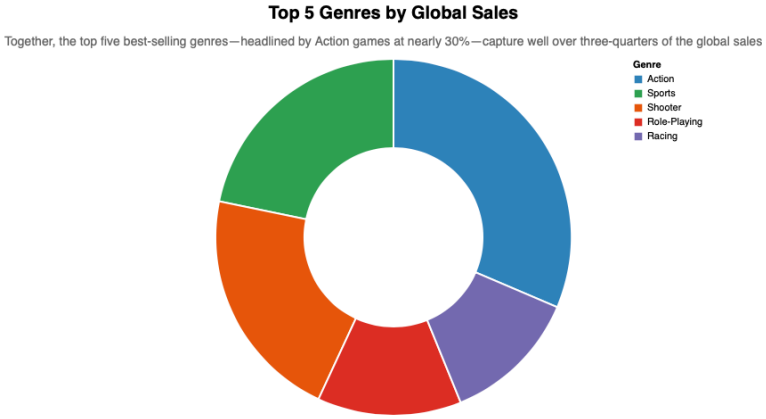


Figure 7: Top 5 Genres by Global Sales

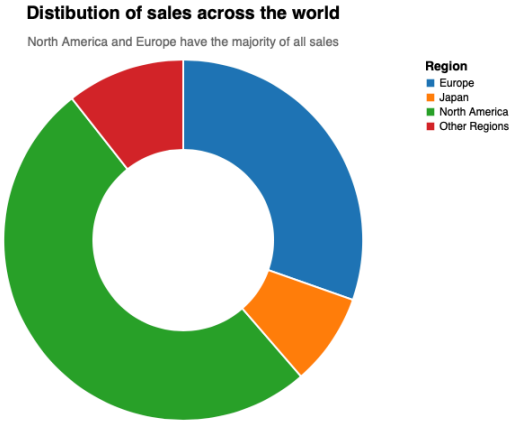


Figure 8: Global Market Distribution

**Analysis of Figure 7 Top 5 Genres by Global Sales**

Together, the top five best-selling genres—headlined by Action games at nearly 30%—capture well over three-quarters of the global sales pie. Sports and Shooter make up substantial slices, followed by Role-Playing and Racing genres. Their collective dominance underscores both the industry's strategic pursuit of mainstream preferences and the potential for emerging developers to explore underrepresented niches outside these dominant categories.

**Chart Design and Methodology**

A donut chart with a pronounced inner radius improves upon a basic pie chart by minimizing the optical illusion issues that arise when comparing different slices. The central hole is also a space where either a total sum or custom label could be placed. A balanced category10 color scheme is used so each genre slice is visually distinct. Hover interactions reveal both raw sales figures and percentages of the overall total, and a neatly positioned legend clarifies which slice belongs to which genre, offering redundancy in color-coding and textual labeling.

**Analysis of Figure 8 Global Market Distribution**

North America and Europe collectively command well beyond half of the global gaming market, signifying a substantial consumer base and robust retail ecosystems. Japan remains an influential player, despite being notably smaller than NA and Europe in raw population terms. Meanwhile, the "Other" category, encompassing multiple continents, suggests room for future market expansions and

underscores that demand for video games is neither static nor restricted solely to the most historically active regions.

**Chart Design and Methodology**

This donut chart is constrained to a 500×400px canvas. The inner and outer radii (100px and 200px) create ample ring thickness to differentiate slices but still leave enough negative space for a clear visual partition between them. Each region is assigned a distinct hue in a category10 palette mapped by geography, such as green shades for North America and Europe, red or pink for Japan, etc. A thin white stroke (2px) separates slices, ensuring each segment's boundary is crisp. Tooltips pop up on hover to display absolute unit sales alongside the percentage for a robust part-to-whole perspective.

### 4.2.5 Game Sales by Genre and Region and Comparison between Platforms and Genres

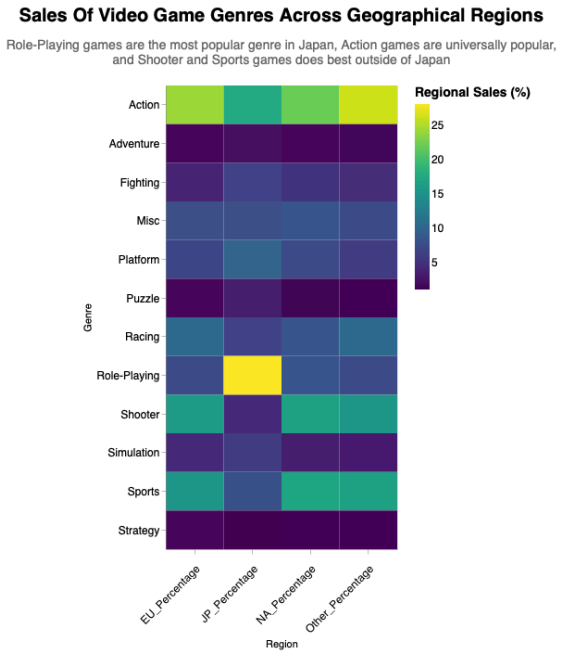


Figure 9: Game Sales by Genre and Region

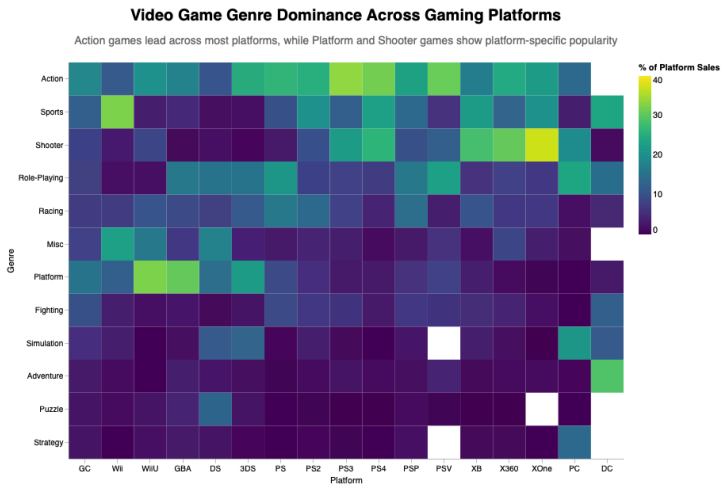


Figure 10: Comparing Game Sales Between Platforms and Genres

**Analysis of Figure 9 Game Sales by Genre and Region**

While Action games maintain impressive popularity globally, the heatmap highlights a remarkable local phenomenon: Role-Playing games thrive disproportionately well in Japan compared to their performance outside it. Shooter and Sports games, by contrast, experience massive success in North America and Europe but barely register in Japanese charts. Such discrepancies in taste point to the cultural influences and historical evolution of game consumption in each region.

**Chart Design and Methodology**

A 250×500px heatmap is engineered for compactness without sacrificing clarity. The chosen Viridis color palette systematically darkens or lightens with each step, assisting in the identification of even small percentage differences. Regions form the columns (labeled at a −45° tilt so they fit neatly), while genres are kept in a logical order running down the rows. Hovering a cell reveals the exact numeric breakdown or percentage, supporting data-driven comparisons instead of guesswork from shading alone.

**Analysis of Figure 10 Comparing Game Sales Between Platforms and Genres**

Across most systems, Action titles remain top-sellers, reflecting their mass appeal. However, each console group still carries a signature genre: Nintendo's success with Platform-style games like Mario, Microsoft's attraction of shooter enthusiasts on Xbox, and Sony's consistent performance across multiple genres, including more niche categories like JRPGs—a testament to their multicultural library and partnerships.

**Chart Design and Methodology**

Once again using the Viridis palette, this heatmap normalizes sales by platform so that smaller or less globally distributed consoles can still be fairly compared to juggernauts. The 700×500px format leaves space for a legend explaining what each color gradient value represents. Platform labels are sorted by manufacturer group—e.g., all Nintendo platforms together, all PlayStation platforms together—while genres are sorted by total popularity, ensuring the viewer can discern cross-platform patterns or anomalies.

### 4.2.6 Market Share Over Time by Genre and Market Share Over Time By Platform

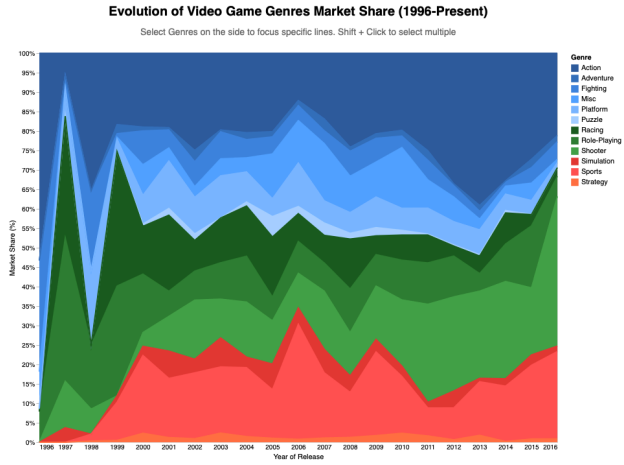


Figure 11: Market Share Over Time by Genre

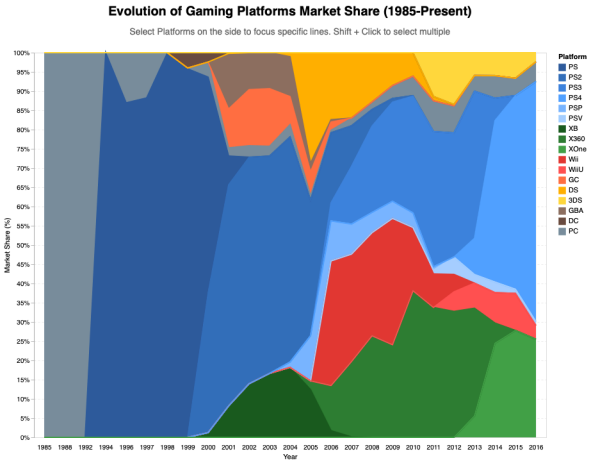


Figure 12: Market Share Over Time by Platform

**Analysis of Figure 11 Market Share Over Time by Genre**

Beginning in 1996, this line chart demonstrates the ebb and flow of each genre's portion of the industry's overall sales. Certain genres, such as Action, appear to sustain a leading share across decades, whereas others undergo periods of surging relevance—like Shooter games gaining traction in the 2000s. By allowing comparison of multiple lines simultaneously, viewers can see, for instance, how Sports maintain a relatively stable chunk of the market or how Racing games ascend and descend around major franchise releases.

**Chart Design and Methodology**

This interactive line chart is sized at 800×600px so each line's trend is discernible even when multiple genres are toggled. Colors from category10 differentiate each genre. The vertical axis employs percentages rather than raw unit numbers to level the playing field among categories with inherently different volumes. An interactive legend lets viewers focus on fewer lines at a time, clarifying how a genre's share evolves in isolation. The timeline starting from 1996 ensures more robust data and consistency in measurement methods.

**Analysis of Figure 12 Market Share Over Time by Platform**

Following console generations through the decades, we observe cyclical rises and falls: early dominance by certain brands that later recede to niche status, and the consistent foothold of PC gaming as a stable alternative. Notable transitions occur with each new console generation from Sony (e.g., PS1 to

PS2), Microsoft (Xbox to Xbox 360), and Nintendo (N64 to Wii), revealing how hardware improvements can recalibrate market share.

**Chart Design and Methodology**

By using a custom color scheme grouped by console manufacturer (shades of blue for PlayStation, greens for Xbox, purples for Nintendo, neutrals for PC/others), the chart underscores familial ties among platforms. The 3px stroke width balances visual prominence and prevents overlapping lines from merging into a single mass. Tooltips provide platform-specific data points, and toggles in the legend or an interactive check-box system allow for narrower focus. The uniform time range, starting at 1996, ensures consistency in generational comparisons and data availability.

### 4.2.7 Graphing Critic Reviews with User Reviews and the Difference Between Them

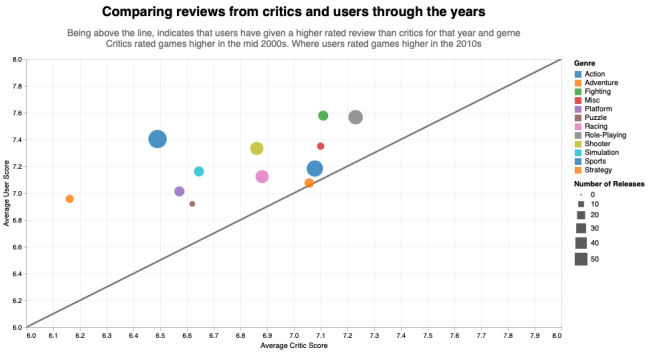


Figure 13: Graphing Critic Reviews with User Reviews

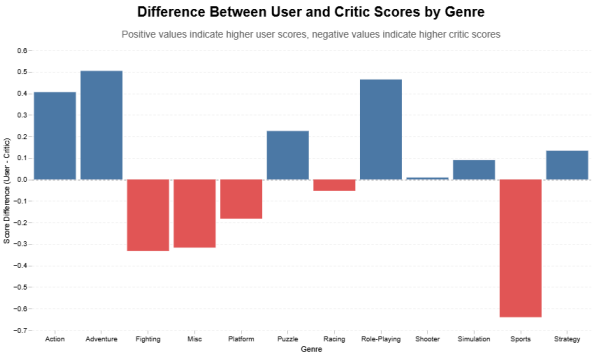


Figure 14: Disagreement Between Critics and Users Over Time

**Analysis of Figure 13 Graphing Critic Reviews with User Reviews**

Placing critic scores on one axis and user scores on the other, this chart for each genre and year cluster suggests most games hover in the mid-to-high range of 6–8 out of 10, but with certain standout titles that garner universal acclaim (above the diagonal) or spark unusual disagreement (far below it). In the early-to-mid 2000s, user enthusiasm often exceeded critic evaluations, reflecting the novelty of certain console leaps or the abundance of crowd-pleasing sequels. However, in later years, critics occasionally outscore the user base, indicating shifts in how professional review criteria vs. fan reception intersect.

**Chart Design and Methodology**

A scatter plot set at 800×400px provides enough horizontal width to show a timeline slider or genre filter along the bottom. Each point's size corresponds to the number of games being considered for that genre-year combination, offering immediate clues about how representative or niche the data is. A diagonal reference line (y = x) visually encodes perfect agreement. Color is assigned by genre, letting viewers see if certain genres (e.g., RPGs) exhibit consistently higher or lower user vs. critic agreement.

**Analysis of Figure 14 Disagreement between Critics and Users Over Time**

This bar chart-based deviation approach highlights which years saw larger disparities. The mid-2000s reflect a strong positive deviation, with users awarding higher average scores compared to critics. By contrast, in more recent years, the average critic rating for many titles outpaced user scores, possibly pointing to shifts in user expectations, a changing demographic for critics, or the rise of more niche or experimental titles that resonate differently with professional reviewers than with broad user bases.

**Chart Design and Methodology**

The visual uses a positive–negative scale on the y-axis, where bars above zero (colored in blue) mean user scores exceed critics, and bars below zero (in red) imply the opposite. Width or shading intensity

can encode how many games contributed to that average difference in a given year. An interactive year slider from 1996 to 2016 enables a dynamic update of the chart, letting users pinpoint precisely when these disagreements spike or dissipate. The 800×400px sizing ensures each bar remains visually discernible, and color-coded legends clarify the meaning of positive versus negative bars.

### 4.2.8 Evolution in Age Ratings for Released Video Games Over Time

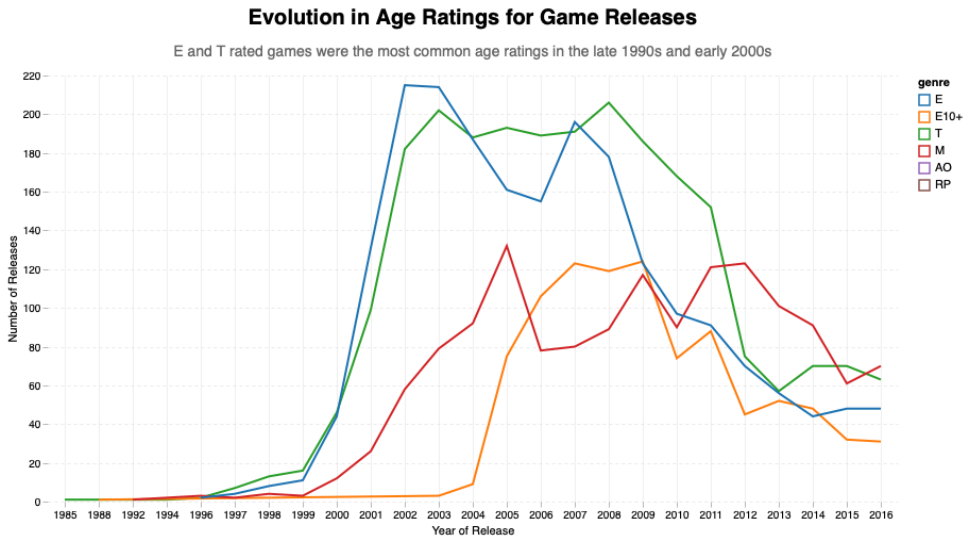


Figure 15: Evolution in Age Ratings for Released Video Games Over Time

**Analysis of Figure 15 Evolution in Age Ratings for Released Video Games Over Time**

Examining ESRB ratings—E, E10+, T, M, and AO—from the mid-1980s through 2016 illustrates a pivot in gaming demographics and content. The surge of T-rated (Teen) and M-rated (Mature) games from the late 1990s onward suggests that as hardware capabilities expanded and larger budgets came into the fold, developers ventured into more complex, potentially adult narratives. Yet, E-rated titles remained a cornerstone, indicating that family-friendly or child-appropriate markets have never ceased to be a profitable segment.

**Chart Design and Methodology**

This 800×400px line chart uses the category10 palette to assign a distinct color to each ESRB rating, ensuring immediate distinction among lines. By using absolute release counts on the y-axis (rather than percentages), viewers can see growth patterns in the industry as well as expansions in each age category. An interactive legend allows toggling specific ratings on or off, clarifying how each rating gained or lost momentum over time. Smooth transitions and tooltips make it easier to follow the precise volume of releases for a given rating and year.

# 5 Story and Results

*here you should provide answers to the questions in 2.Project Objectives. Tell the story of the data that you saw in the visualization. What were your expectations and how close they were to what data revealed. What did you learn about the data by using your visualizations? How did you answer your questions? How well does your visualization work, and how could you further improve it?*

By excluding incomplete datapoints, we are also excluding many of the games released in the first decade of video game releases. This means that many of the initial gaming platforms will not be a part of this exploration, which is a bit of a double-edged sword. On the one hand, this means there is less noise in the data when looking at recent developments in trends. However, at the same time, this lack of data from the infancy of home gaming consoles makes it very difficult to obtain any insights in the

evolution of video games, and limits the possibilities for deeper investigations. Obsolete home consoles like Sega or Atari might not be relevant when looking at current market shares and trends, but would be vital if investigating why certain platforms flourished and other faded into obscurity. Granted, such an exploration would require additional data, such as console specifications and limitations, and could not be performed exclusively using this dashboard, but the lack of data from that time period prevents this dashboard from being useful for such an investigation.

# 6 Conclusion and Discussion

This report effectively use data visualization techniques to show key patterns and trends of the global video game industry. By analyzing a comprehensive dataset the report identifies some of the biggest market leaders, such as EA and Nintendo. There are also some dominant genres like Action and Shooter games that has great dominance. Its also revealed that that regional preference tends to vary: Japan demonstrated a strong affection towards Role-Playing games, while North America and Europe both favor Sport and Shooter titles. These insights highlight the cultural factors shaping trends in gaming for each region.

The analysis further explored mismatches between user and critics ratings, revealing that users seem to vary more in their assessments, at different times over the decades, in contrast to processional critiques. This shows the significant role of subjective experiences in shaping public perceptions of video games. Additionally, the report illustrates how advancements in hardware and shifts in user demographics have driven the industry's evolution towards more Mature-rated titles.

There were some challenges that arose during the project, notably managing missing data and balancing visualizations clarity with dataset limitations. While excluding incomplete entries enhanced data quality, it shrunk the data set notably and reduced the early gaming informations. If the project had to be extended it could be good to address these gaps by integrating supplementary datasets.

The project demonstrates that interactive visualizations powered by VegaLite and web frameworks can enhance the accessibility and appeal of complicated datasets. Future expansions, such as finer dashboard designs, predictive analytics capabilities, or extended network technology integration, would further raise the level of this approach and perhaps permit much easier explorations of emerging trends in video games.

# 7 Bibliography

[1] E. Tretkoff. (2008, September). "October 1958: Physicist Invents First Video Game". *American Physical Society[Online].*Available: https://www.aps.org/apsnews/2008/09/first-video-game

# 8 Appendix