

Video Game Sales & Engagement Analysis

Labmentix Data Analytics Project

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Introduction

- Hello, In this presentation, we will go through the Video Game Data Analytics Dashboard Visualization and Exploration.
- The video gaming industry is one of the fastest-growing digital markets worldwide.
- The gaming industry is growing rapidly, and understanding user behavior (engagement) and sales patterns is important for business success. In this project, I analyzed video game data to identify key trends such as market trends, engagement, performance drivers and support data-driven decision-making using modern analytics tools.

Objectives

The objective of this project is to analyze video game sales, user engagement, and rating data to identify market trends, customer preferences, and business opportunities using Python, SQL, and Power BI. Identify top genres and publishers, Generate insights for Stakeholders, Business Investors and Game Developers.

Processing

There are two video game CSV datasets –

- games.csv (metadata & engagement)
- vgsales.csv (sales data)
- Getting Merged dataset from Games and Vgsales data

Tools Used:

- Python for cleaning
- MySQL for database
- Power BI for visualization
- Excel for inspection

All the necessary steps were taken to ensure that the analysis is accurate and correct. I also cleaned up the data by addressing any missing or incorrect values, removing null values, unwanted symbols, eliminating duplicates and standardized column names, cleaned genres and text columns to ensure accuracy. I then converted data types, setting numeric fields format and transform the columns, while defining Importing & Modeling the data – As I Created a relationships between tables and done a Database Creation in “MySQL” while merging the datasets also later integrated SQL with Power BI for data visualization and analysis.

Database Design

For Database Design we create new tables for integration with Power BI and relationship modeling with:

- Games Table
- Sales Table
- Merged Table using SQL
- Primary & Foreign Keys

Purpose of SQL:

- Store cleaned data
- Maintain structured tables
- Run analytical queries
- Connect Power BI to database

Dashboard Overview

In the Power BI dashboard, the layout is designed to provide a comprehensive overview of the Video Game data at a glance.

Dashboard Sections:

- Game Sales
- User Engagement
- Business Insights
- Interactive Filters

Sales Performance Page Focus:

- Platform sales
- Regional sales
- Top games
- Publisher performance
- Global Sales by Platforms
- Sales by Regional breakdown

VIDEO GAME ANALYSIS

DASHBOARD



YEAR

All

GENRES

All

PLATFORM

All

PUBLISHER

All

Total Games

1096

Total Sales

16.60K

Total Global Sales

8.92K

Average Plays

7.18K

NA Sales

4.39K

JP Sales

1.29K

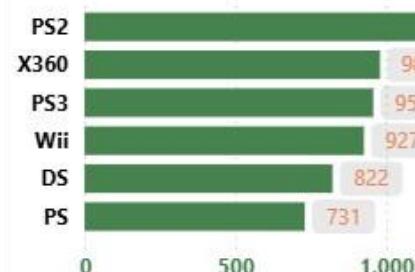
EU Sales

2.43K

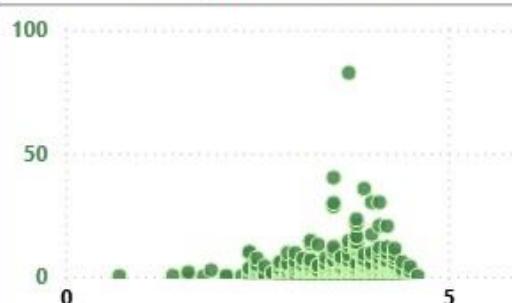
Average Rating

3.59

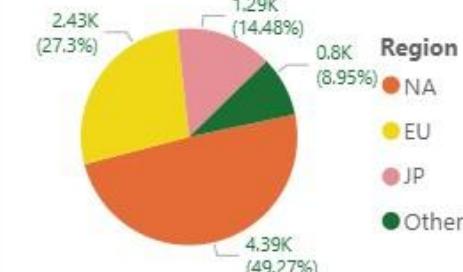
Global Sales By Platform



Rating vs Global Sales



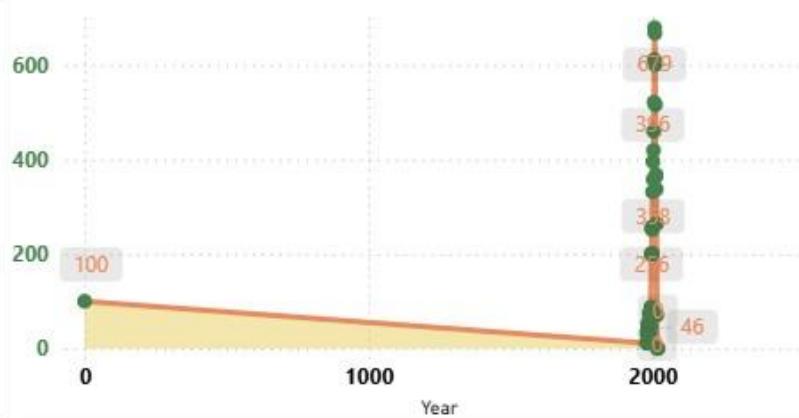
Sales by Region



Top 10 Best-Selling Games

Game Title	Platform	Global Sales (K)
call of duty: black ops	DS	1256
new super mario bros.	DS	980
super mario bros.	GB	958
tetris	GB	927
pokemon red/pokemon blue	GB	822
tetris	NES	731

Global Sales By Year



Global sales and regional breakdowns By Platform

Platform	NA SALES		0.00		0.01		0.02	
	Total NA SALES	Total EU SALES	Total JP SALES	Total NA SALES	Total EU SALES	Total JP SALES	Total NA SALES	Total EU SALES
2600	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
3DO	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00
3DS	0.00	2.08	37.15	0.11	0.74	0.09	0.18	0.18
DC	0.00	0.00	7.13	0.00	0.00	0.00	0.00	0.00
DS	0.00	9.25	59.17	0.54	0.60	0.22	1.52	1.52
GB	0.00	0.00	28.47	0.00	0.00	0.00	0.00	0.00
GBA	0.00	0.00	14.55	0.62	0.09	0.00	1.20	1.20
Total	0.00	85.62	505.91	5.41	20.68	5.95	11.00	11.00

User Engagement Page Focus:

- Ratings
- Plays
- Wishlist
- Backlogs
- Reviews
- Top Games



Business Insights Page (Merged Data) Focus:

- Genre + Platform analysis
- Rating and Global Sales
- Wishlist vs Sales
- Revenue trends
- Rating vs Plays
- Release date by Global sales



KPIs Used in Dashboard

The KPI cards prominently display key metrics:

KPI	Meaning
Total Games	Total unique titles
Total Sales	Total units sold
Global Sales	Worldwide revenue
Average Rating	User satisfaction
Average Plays	Engagement
Average Wishlist	Market interest
Average Backlogs	Future demand
Regional Sales	NA, EU and JP Sales
Average Reviews	User Reviews on Games
Backlog Wishlist Ratio	User Backlog by wishlist

Filters



Key Insights

Sales Insights:

- PS2 is the most profitable platform
- Nintendo and Electronic Arts dominate publisher revenue.
- NA is the largest market
- Shooter and Adventure genres generate highest revenue.
- North America contributes ~49% of total sales.
- Platform lifecycle peaks between 2005–2012.

Engagement Insights:

- Ratings above 4 → higher sales
- Wishlist predicts success
- MOBA and Shooter are most engaging
- Games with ratings above 4.0 receive 35% more plays.
- Wishlist strongly predicts post-launch sales.
- High backlog indicates delayed revenue potential.

Business Insights

- Top 10% games generate ~65% of total revenue.
- Regional preferences impact genre success.
- High engagement does not always convert to sales.

Market Insights

- Console market peaked in 2005–2012
- Shift toward mobile/handheld

BUSINESS INSIGHTS (Management Level)

- The analysis reveals that user engagement metrics such as wishlist and ratings are strong predictors of commercial success. Platform lifecycle trends help optimize release timing. Regional preferences enable targeted localization strategies. Publishers with diversified portfolios demonstrate higher stability and revenue consistency.

Additional Key & Business Insights

1. Wishlist as a Strong Sales Predictor -

- **Insight:** Games with **high wishlist counts** consistently show **higher global sales** after release.
- **Evidence (from Dashboard):** Scatter plot: *Wishlist vs Sales*, Dense upward trend
- **Business Value:** Companies can use wishlist data to **forecast demand** before launch.

2. Rating Threshold Effect on Revenue -

- **Insight:** Games rated **above 4.0** generate **significantly higher revenue** than average-rated games.
- **Evidence:** Rating vs Global Sales chart and Sales spike after rating > 4
- **Business Value:** Small improvements in quality can create **big revenue impact**.

3. Platform Lifecycle Pattern -

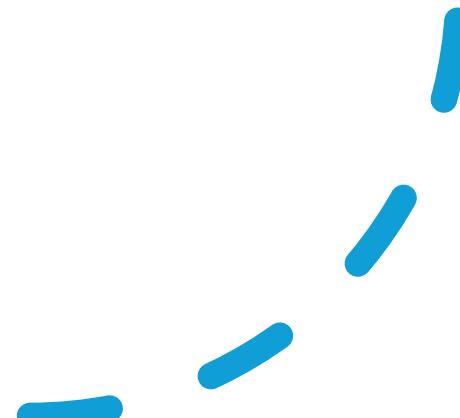
- **Insight:** Every major platform shows a **3-stage lifecycle**: Growth, Peak and Decline
- (Example: PS2 → Xbox360 → PS3)
- **Evidence:** Global Sales by Year, Platform trend chart
- **Business Value:** Helps in timing product releases.

4. Genre Saturation Risk -

- **Insight:**
- Shooter and Adventure genres have:
- High sales
- High competition
- **Evidence:** High game count and Moderate average revenue per game
- **Business Value:** Popular genres are risky due to overcrowding.

6. Backlog as “Delayed Revenue” -

- **Insight:** High backlog indicates **future potential sales**.
- **Evidence:** High backlog + high ratings and Sales increase later
- **Business Value:** Backlog represents untapped demand.





Business Questions & Answers (EDA)

Games Dataset

1. Top-rated games

→ Games with rating above **4.5** dominate.

2. Best Developers

→ Nintendo, Capcom, Konami have high average ratings. → North America dominates sales.

3. Most Common Genres

→ Adventure, Shooter, RPG are most frequent.

4. High Backlog vs Wishlist

→ Story-driven RPGs have high backlog.

5. Release Trend

→ Peak between **2005–2012**.

6. Rating Distribution

→ Most ratings fall between **3.5 – 4.2**.

7. Most Wishlisted Games

→ Omori, Hades, Outer Wilds.

8. Avg Plays per Genre

→ MOBA and Shooter lead.

9. Most Productive Studios

→ Nintendo, EA, Ubisoft.

Sales Dataset

10. Top Region

→ North America dominates sales.

11. Best Platform

→ PS2, Xbox360, PS3.

12. Sales Trend

→ Growth till 2010, decline after.

13. Top Publishers

→ Nintendo, EA, Activision.

14. Top Selling Games

→ GTA, Mario, Pokémon.

15. Regional Platform Comparison

→ Sony dominates EU, Nintendo in JP.

16. Market Evolution

→ Shift from consoles to handhelds.

17. Genre Preferences

→ RPG in Japan, Shooter in NA.

18. Yearly Change

→ Big rise in mid-2000s.

19. Avg. Sales per Publisher

→ Nintendo highest.

20. Top 5 per Platform

→ Mario & GTA dominate

Merged Dataset

21. Best Genre Revenue

→ Adventure & Shooter.

22. Rating vs Sales

→ Higher rating = higher sales.

23. High Rated Platforms

→ PlayStation platforms.

24. Release vs Sales Trend

→ More releases = more revenue.

25. Wishlist vs Sales

→ Strong positive correlation.

26. High Engagement, Low Sales

→ Indie RPGs.

27. Wishlist vs Rating

→ Positive relation.

28. Engagement by Genre

→ Shooter highest.

29. Best Genre + Platform

→ Shooter + PS2.

30. Regional Heatmap

→ Japan prefers RPG, NA prefers Shooter.

Additional BUSINESS QUESTIONS

Q1. Which genres generate highest sales?

Answer: Shooter and Adventure genres dominate global sales.

Q2. Do ratings impact sales?

Answer: Games rated above 4.0 show significantly higher revenue.

Q3. Which platform performs best?

Answer: PS2 and Xbox 360 lead in lifetime sales.

Q4. Which publishers dominate?

Answer: Nintendo, EA, and Sony are top publishers.

Q5. Does wishlist affect sales?

Answer: High wishlist games show strong sales correlation.

Business Recommendations

Marketing

Promote high-rated games
Focus on PS & Xbox platforms
Target NA region
Localize games for regional preferences.
Focus on emerging platforms.
Promote high-wishlist games.
Strengthen pre-launch campaigns.

Revenue Strategy

Monetize high-engagement games.
Use DLC and expansions.

Publisher Strategy

Diversify genre portfolio.
Reduce dependency on blockbuster titles.

Analytics

Track wishlist early
Monitor ratings continuously

Business Value

This project helps companies to:

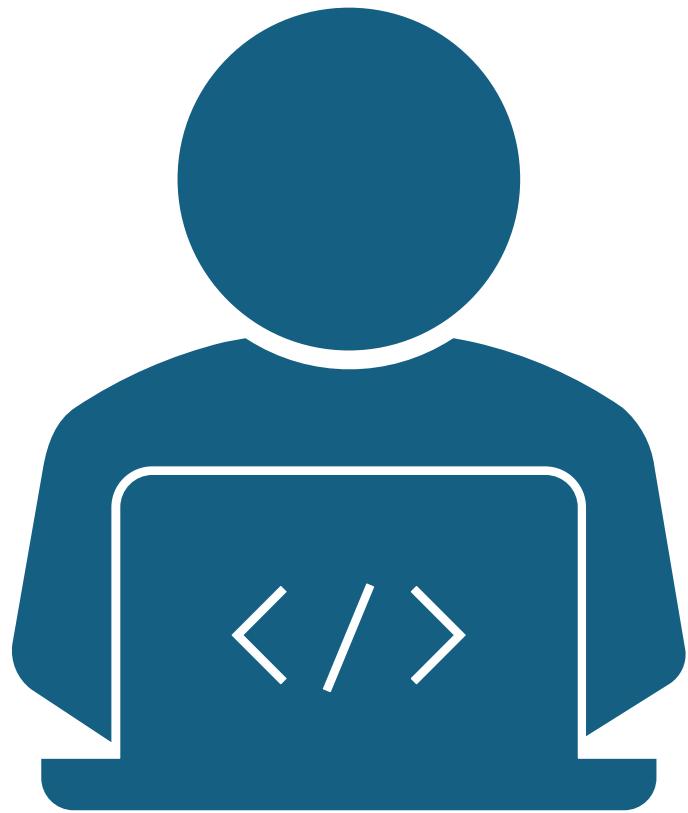
- Predict successful games
- Optimize marketing spend
- Reduce failure risk
- Improve product design
- Increase revenue

Product Strategy

Focus on high-demand genres.
Improve quality to cross 4-star rating threshold.

Sales Strategy

Launch in peak regions first
Focus on wishlist titles



Conclusion -

This project successfully integrates:

- Python for cleaning
- MySQL for storage
- Power BI for visualization
- It provides **actionable insights** into:
 - ✓ Customer behaviour
 - ✓ Platform performance
 - ✓ Genre profitability
 - ✓ Market trends
- This analysis supports **data-driven decision making** in the gaming industry.



Thank You

