

Global Gaming Ecosystem: Analyzing Esports, Sales, and Market Dynamics

1. Introduction and Problem Statement

The global gaming industry is a rapidly evolving market with diverse revenue streams, including direct game sales and esports earnings. Understanding the relationship between game sales and esports performance can help stakeholders optimize marketing strategies, develop competitive products, and enhance customer engagement. This assignment aims to analyze game sales trends, esports earnings, and market dynamics using a structured data model and interactive visualizations.

The gaming industry is highly dynamic and competitive, and many businesses struggle to find clear insights into what drives market success.

- We see challenges in identifying how traditional game sales correlate with esports earnings, along with understanding regional and platform-specific differences.
- Without clear data, it's difficult to tailor strategies that maximize growth, boost brand visibility, and seize emerging opportunities.

2. Data Sources and Collection Methodology

The data used in this analysis includes:

- **Game Sales Data:** CSV files(vg_sales) with regional and global sales figures.
- **Esports Earnings Data:** xlxs file providing earnings, player participation, and tournament statistics.

Data was cleaned and transformed using Power Query in Power BI to ensure consistency and accuracy.

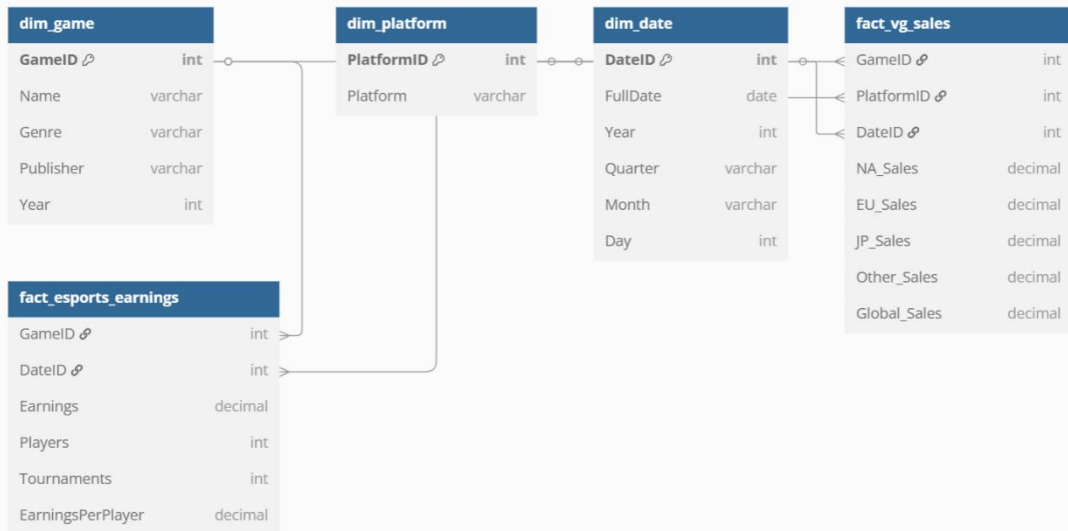
- removed duplicate game names in both table
- incorporated correct datatypes for every columns.
- Deleted duplicate values.

3. Data Model Design and Implementation

The **Star Schema** is used for structuring the data, consisting of:

- **Fact Tables:**
 - Fact_GameSales: Stores sales figures across regions.
 - Fact_EsportsEarnings: Captures esports earnings and participation.
- **Dimension Tables:**
 - Dim_Game: Game metadata (name, genre, publisher, year).
 - Dim_Platform: Details about gaming platforms.
 - Dim_Date: Date attributes for time-series analysis.

Entity-Relationship Diagram (ERD)



Data dictionary

dim_game (Game Details)

- GameID (int, PK) → Unique identifier for each game.
- Name (varchar) → Name of the video game.
- Genre (varchar) → Genre/category of the game (e.g., Action, Sports, RPG).
- Publisher (varchar) → Company that published the game.
- Year (int) → Year of release.

dim_platform (Gaming Platforms)

- PlatformID (int, PK) → Unique identifier for each platform.
- Platform (varchar) → Name of the platform (e.g., PlayStation, Xbox, PC).

dim_date (Date Information)

- DateID (int, PK) → Unique identifier for each date.
- FullDate (date) → Complete date (YYYY-MM-DD).
- Year (int) → Year value (e.g., 2024).
- Quarter (varchar) → Quarter of the year (Q1, Q2, Q3, Q4).
- Month (varchar) → Name of the month (e.g., January, February).
- Day (int) → Day of the month (1-31).

Fact Tables

fact_vg_sales (Video Game Sales Data)

- GameID (int, FK) → Foreign key referencing dim_game.GameID.
- PlatformID (int, FK) → Foreign key referencing dim_platform.PlatformID.
- DateID (int, FK) → Foreign key referencing dim_date.DateID.
- NA_Sales (decimal) → Sales in North America (in millions of units).
- EU_Sales (decimal) → Sales in Europe (in millions of units).
- JP_Sales (decimal) → Sales in Japan (in millions of units).
- Other_Sales (decimal) → Sales in other regions (in millions of units).
- Global_Sales (decimal) → Total worldwide sales (sum of all regions, in millions).

fact_esports_earnings (Esports Earnings & Player Data)

- GameID (int, FK) → Foreign key referencing dim_game.GameID.
- DateID (int, FK) → Foreign key referencing dim_date.DateID.
- Earnings (decimal) → Total earnings from esports tournaments (in USD).
- Players (int) → Number of players participating in esports tournaments.
- Tournaments (int) → Total number of tournaments held for the game.
- EarningsPerPlayer (decimal) → Average earnings per player ($\text{Earnings} \div \text{Players}$).

4. Visualization Approach and Tool Justification

Tool Selection: Power BI

- Strong data modeling and DAX capabilities.
- Advanced visualizations with interactive dashboards.
- Seamless integration with multiple data sources.

Dashboard Designs

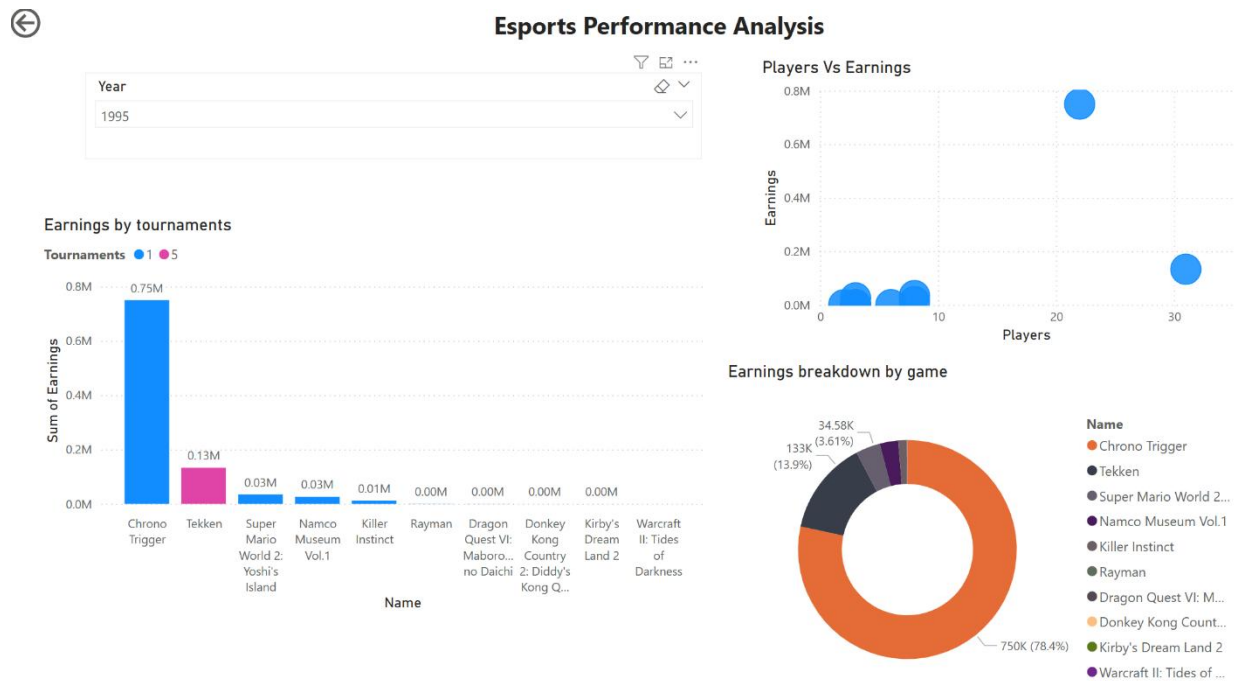
Dashboard 1: Global Gaming Market Overview

- **Treemap:** Game sales distribution by genre.
- **World Map:** Regional sales performance.
- **Cards:** Total global sales, average earnings per player.



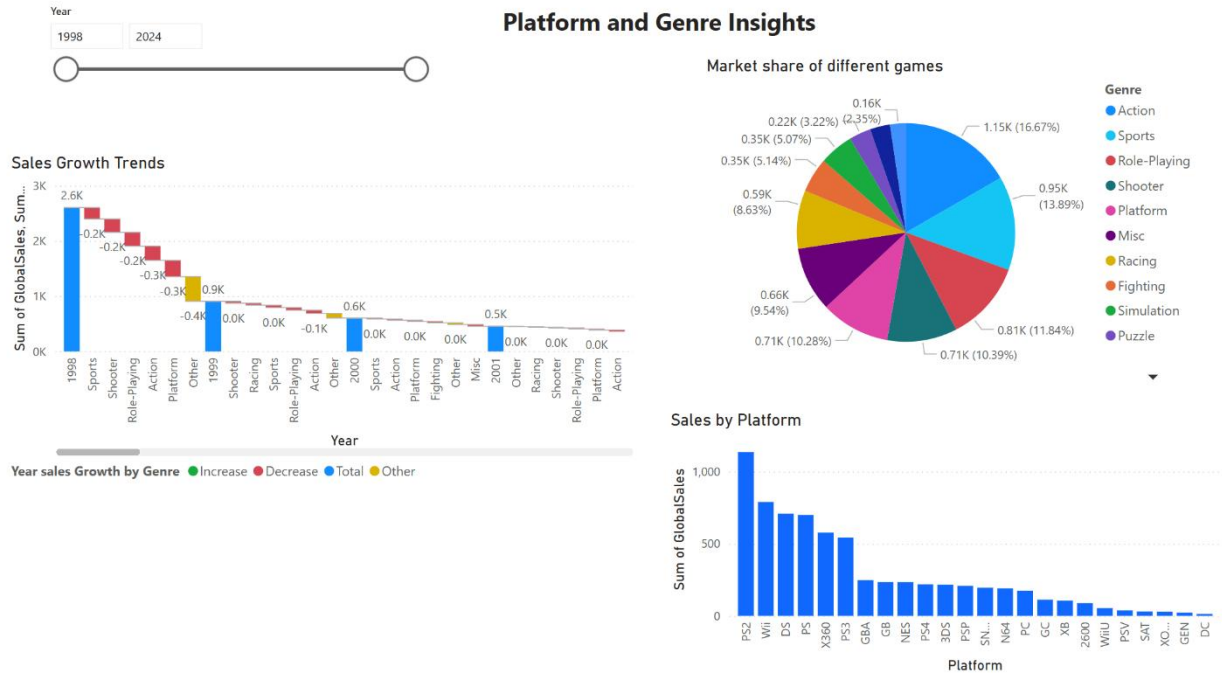
Dashboard 2: Esports Performance Analysis

- **Donut Chart:** Earnings breakdown by game.
- **Scatter Plot:** Players vs. earnings.
- **Stacked Column Chart:** Earnings per tournament.



]Dashboard 3: Platform and Genre Insights

- **Clustered Column Chart:** Sales by platform.
- **Pie Chart:** Market share of different genres.
- **Waterfall Chart:** Sales growth trends.



Key Findings:

1. **Esports earnings correlate with game sales:**
 - Games with high esports earnings tend to have strong global sales.
2. **Regional variations in market trends:**
 - PC dominates esports earnings, while consoles lead in game sales.
3. **Japanese market insights:**
 - Lower sales but high esports participation, indicating cultural preferences for competitive gaming.

Actionable Insights:

- **Invest in high-performing genres with strong esports earnings.**
- **Develop targeted marketing strategies based on regional gaming preferences.**
- **Leverage esports events to drive game sales and engagement.**

5. Documentation of Advanced Calculations

Key DAX Measures

Total Global Sales:

Total Global Sales = SUM(Fact_GameSales[Global_Sales])

Real-time Use:

- A **gaming company** monitors **live sales data** across different regions, updating dashboards every hour.
- Marketing teams track the **impact of promotions** on sales performance.
- Investors use the metric to gauge a game's market success.

Year-over-Year Growth:

- YoY Growth =
- VAR CurrentYearSales = SUM(Fact_GameSales[Global_Sales])
- VAR PreviousYearSales = CALCULATE(SUM(Fact_GameSales[Global_Sales]), PREVIOUSYEAR(Dim_Date[Year]))

RETURN DIVIDE(CurrentYearSales - PreviousYearSales, PreviousYearSales)

Real-time Use:

- Gaming companies **compare current sales performance with last year's** to adjust pricing or promotions.
- Helps decision-makers **forecast sales trends** and allocate budgets for upcoming game releases.
- Identifies **seasonal trends** (e.g., higher sales in Q4 due to holiday promotions).

Earnings Per Player:

Earnings Per Player = DIVIDE(Fact_Esports_earnings[Earnings],
Fact_EsportsEarnings[Players])

Real-time Use:

- **Esports teams & sponsors** assess which games are most profitable per player to invest in tournaments.
- Gaming companies evaluate if **higher player engagement** in esports **drives more revenue**.
- Analysts compare earnings per player across games to **determine monetization efficiency**.

Market Share by Game

MarketShare_ByGame =

DIVIDE(
SUM('fact_esport_earnings'[Earnings]),
CALCULATE(SUM('fact_esports_earnings'[Earnings]), ALL('fact_esports_earnings')),
0
)

This measure calculates each game's contribution to total esports earnings.

Custom KPI (earnings):

```
Earnings_KPI = VAR CurrentEarnings = SUM('fact_esports_earnings'[Earnings]) VAR  
TargetEarnings = 1000000 -- Set target threshold RETURN SWITCH( TRUE(),  
CurrentEarnings >= TargetEarnings, " Excellent", CurrentEarnings >= TargetEarnings * 0.8,  
Good", " Needs Improvement" )
```

Insight:

Esports Organizations & Sponsors

- Helps sponsors identify high-performing games for partnerships.
- Determines if a game's esports ecosystem is growing or struggling based on earnings.

Game Publishers & Developers

- Evaluates **monetization success** of an esports title.
- Assists in deciding whether to **invest more in esports events** to boost player engagement.

3-month moving average of esports earnings:

MovingAvg_Earnings =

```
AVERAGEX(  
    DATESINPERIOD('dim_date'[FullDate], LASTDATE('dim_date'[FullDate]), -3, MONTH),  
    CALCULATE(SUM('fact_esports_earnings'[Earnings]))  
)
```

Measure Name	Description	Logic
TotalEarnings	Calculates total esports earnings	Uses SUM() to sum earnings from fact_esport_earnings
YoY_Earnings_Growth	Compares current year's earnings with last year	Uses SAMEPERIODLASTYEAR() for YoY comparison
MovingAvg_Earnings	3-month rolling average of earnings	Uses DATESINPERIOD() to smooth fluctuations
Earnings_KPI	Custom KPI with indicators	Uses SWITCH() to assign performance labels
EarningsPerPlayer	Average earnings per player	Uses DIVIDE() for ratio calculation

Insight:

Esports Earnings Trend Analysis

- Used in a **line chart** to **smooth earnings fluctuations** and identify long-term trends.
- Helps detect **seasonal spikes** (e.g., earnings increasing during major esports tournaments).

Performance Monitoring for Game Publishers

- If a game's **moving average earnings are declining**, it may indicate **reduced player engagement**.
- Helps **adjust marketing spend or introduce new in-game events** to boost player participation.

These DAX calculations provide real-time, data-driven insights that help gaming companies, esports organizers, and investors make critical decisions. By integrating Power BI dashboards with live data sources (APIs, streaming databases), stakeholders can react to market trends dynamically.

6. Analysis of Findings and Insights

Key Findings:

1. Esports earnings correlate with game sales:

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Actionable Insights:

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So this is designed for gaming executives, esports sponsors, publishers, and analysts who need insights into the relationship between esports earnings and game sales.

- Game Publishers (e.g., EA, Activision, Riot Games) → Want to understand how esports impacts game sales.

- Esports Organizations (e.g., ESL, DreamHack, The International) → Need data to determine which games drive player engagement and profitability.
- Investors & Sponsors (e.g., Red Bull, Logitech, Intel) → Want to invest in games with sustainable esports ecosystems.

7. Challenges Encountered and Solutions Implemented

Challenges:

- Data inconsistency in sales and earnings reports.
- Missing values in sales records.
- N/A in year column.
- Integrating multiple data sources efficiently.
- Managing large datasets for interactive performance.

Solutions:

- Used Power Query for data cleaning and transformation.
- Optimized data model with indexing and relationships.
- Implemented DAX calculations for efficient performance.

In conclusion

Our data-driven approach leverages various dashboards and visualizations to dissect market trends on a global scale.

- By analyzing regional sales, genre performance, and esports earnings, we can pinpoint key correlations such as the strong link between esports success and overall game sales.
- This insight enables us to craft targeted strategies: investing in high-performing esports titles, customizing marketing for different regions, and fine-tuning approaches for various platforms and genres.

8. Future Enhancements

1. Integrating Real-Time Esports Earnings Updates

Esports earnings fluctuate quickly, especially during tournaments. Real-time updates are essential for informed decision-making.

How:

- **Streaming Data Integration:** Connect live data from tournament platforms (e.g., ESL, Twitch) to Power BI.
- **APIs/Web Scraping:** Pull earnings data through APIs or web scraping from major esports platforms.
- **Power BI Streaming Datasets:** Automatically update dashboards with live earnings.

2. Enhancing Predictive Analytics for Future Sales Trends

Anticipating future game sales can help adjust marketing strategies and investments ahead of time.

How:

- **Time-Series Forecasting:** Use machine learning algorithms to predict future sales based on historical trends.
- **DAX-based Projections:** Build DAX measures for **year-over-year growth projections** and **moving averages** to predict upcoming sales patterns.

3. Expanding Regional Analysis for Emerging Gaming Markets

New gaming markets (e.g., Southeast Asia, Africa) are growing rapidly. Tailored strategies are needed to tap into these markets.

How:

- **Regional Data Enrichment:** Add new geographic dimensions in the data model for emerging markets.
- **Cultural Insights:** Include data on local preferences, trends, and platforms to customize marketing and game release strategies.