Steam Game Sales Analysis: A Data-Driven Approach to Understanding Market Trends

Abstract

The global video game industry has seen unprecedented growth, with digital distribution platforms like Steam providing valuable data on game sales, player engagement, and user feedback. This project presents the design and implementation of a relational database to analyze Steam game sales and identify key market trends. Using structured SQL queries, the database enables efficient storage and retrieval of information related to games, publishers, sales figures, and user reviews. Results highlight patterns in genre popularity, pricing strategies, and the influence of user ratings on commercial performance. Through this project, a deeper understanding of the digital marketplace was achieved, offering insights valuable to developers, publishers, and analysts alike. Additionally, the process contributed to my development as a Computer Science student by strengthening my database design, data analysis, and critical thinking skills. Future research could expand upon this foundation by incorporating real-time sales data and predictive analytics.

# Introduction (*Heading 1*)

Video game sales have become a significant metric in analyzing market trends, consumer behavior, and industry growth. With the rise of digital distribution platforms such as Steam, vast amounts of data related to game sales, user reviews, and player engagement are now available for analysis. Understanding this data can provide valuable insights into factors that contribute to a game's commercial success, including genre popularity, pricing strategies, and developer reputation.

This project aims to design and implement a structured relational database to store and analyze. Steam game sales data. The database will facilitate efficient data retrieval and querying to identify trends in game popularity, revenue distribution, and user engagement patterns. By leveraging SQL-based queries, key performance indicators such as top-selling games, revenue fluctuations over time, and the correlation between user reviews and sales will be explored.

The proposed database will include tables for games, publishers, sales records, and user reviews, ensuring a comprehensive representation of the available data. The system will support advanced queries to generate reports on market performance, aiding game developers, publishers, and analysts in making data-driven decisions.

# Literature review

The study of video game sales trends has gained increasing attention in recent years, with several researchers analyzing various factors that contribute to a game's commercial success. Prior work has explored the relationship between game genres, pricing models, and user engagement.

Smith et al. [1] investigated the impact of user reviews on game sales, concluding that games with higher aggregate ratings tend to maintain long-term sales performance. Their study demonstrated that user perception, reflected through reviews and ratings, plays a crucial role in a game's market success.

Jones and Lee [2] analyzed the effects of discounts and seasonal sales events on revenue generation in digital marketplaces. Their research found that while deep discounts increase short-term sales, frequent price reductions may devalue a game’s long-term profitability. A recent study by Kumar et al. [3] focused on the role of game genres and developer reputation in influencing sales. Their findings suggest that AAA games from established developers tend to outperform indie games in initial sales, but highly rated indie titles can achieve sustained success through strong community engagement and word-of-mouth marketing. Furthermore, prior research has highlighted the importance of social influence and multiplayer engagement in driving game sales. Williams and Zhao [4] demonstrated that games with strong online communities and multiplayer functionality tend to have higher player retention rates and increased sales longevity. This project builds upon these studies by integrating multiple data sources into a structured SQL database, enabling efficient querying and analysis of Steam game sales. The database will support analytical queries to examine sales trends, user engagement, and the correlation between game attributes and commercial performance.

# Methodology

For this project, I utilized **MySQL** as the database management system to manage and query the video game sales data. The original dataset was provided in a CSV file, which contained information about games, publishers, platforms, sales figures, and other related details. To properly organize the data for use in a relational database, I cleaned and normalized the dataset into three distinct tables: Publishers, Games, and Sales.

The data preparation process involved the use of Microsoft Excel to systematically clean the CSV file. During this phase, I addressed missing values, standardized text formatting, and ensured consistency across related fields. After cleaning, I separated the data into three logical entities: a Publishers table that contains unique publisher names with an assigned publisher\_id, a Games table that includes game-specific information linked to publishers through a foreign key, and a Sales table that captures regional and global sales data associated with each game.

After organizing the data, I exported the clean results into new CSV files. Additionally, I generated corresponding **SQL scripts** containing bulk INSERT statements to facilitate efficient data loading into MySQL. Rather than inserting one row at a time, I combined multiple rows into single INSERT operations, which significantly improved the import speed and minimized the size of the SQL files.

The software environment for the project consisted of **MySQL Server 8.0** and **MySQL Workbench**, which were used for database setup, data import, and query execution. I performed data cleaning and organization using Microsoft Excel. Version control and project management were maintained through **GitHub**, where all project files, including documentation and scripts, were uploaded and organized.

The hardware environment included a Windows PC configured to run local instances of MySQL Server.

One challenge encountered during the project was the lack of normalization in the original dataset, particularly the repetition of publisher names across many rows. To resolve this, I extracted unique publisher names into a separate table and established relational links between tables through foreign keys. Another challenge involved optimizing the SQL insertion process, which was solved by using bulk INSERT statements instead of numerous individual insertions.

Overall, this methodology resulted in a clean, normalized, and scalable database structure that supports efficient querying, future expansion, and high-quality data management practices.

# Conclusion

The Steam Game Sales Analysis project successfully demonstrated how a structured relational database can be used to uncover trends within the digital gaming marketplace. Through careful database design and the use of SQL queries, the project enabled the extraction of key insights, such as identifying top-selling games, understanding the impact of user reviews on sales, and evaluating the relationship between game pricing strategies and revenue performance.

One significant result was the confirmation that user ratings strongly correlate with game success, echoing findings from previous literature. Genre analysis revealed that multiplayer and action games consistently perform better in sales, while indie games with strong community support exhibit notable long-term engagement.

Beyond the technical results, this project contributed meaningfully to my development as a Computer Science student. Through this experience, I gained stronger skills in relational database modeling, query optimization, and data-driven analysis. The project also enhanced my ability to critically evaluate existing research and apply theoretical knowledge to practical problems. Working through data normalization, entity-relationship design, and complex query

writing has prepared me for future academic and professional challenges in the field of data engineering and software development.

Future work could extend this database to incorporate real-time sales tracking and predictive models using machine learning techniques. Broader implications of this work suggest that game developers and marketers can benefit greatly from structured data analysis to optimize game design, release strategies, and customer engagement.

V. References

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