

Turtle Game report

Dimas Rizqy Firdiansyah

Introduction

This report concerns Turtle Games, a globally recognised game manufacturer and retailer. As a unique business, Turtle Games not only produces its line of products but also sources and retails goods from various manufacturers. The main objective is to explore avenues for enhancing overall sales performance by leveraging customer trends and behaviours. The analysis will cover loyalty points, customer segmentation, social data for marketing, product impact on sales, data reliability, and sales relationships. Utilising sales data, customer reviews, and related datasets, the report aims to provide actionable insights to refine strategy and bolster sales for Turtle Games.

Analytical Approach

The analytical approach entailed the use of two datasets: 'turtle_reviews.csv' and 'turtle_sales.csv'. The former offers vital information about customer reviews and demographic details to inform customer segmentation and assess the loyalty points system. The latter provides insights into sales performances, thus facilitating a detailed examination of product impact on sales, data reliability, and global sales patterns.

The data analysis was conducted using Python and R for data preparation and analysing, including data wrangling, cleaning, and exploratory data analysis (EDA). Python libraries such as pandas, numpy, seaborn, matplotlib, and statsmodel, and R libraries like tidyverse, dplyr, ggplot2, and psych were instrumental in this process.

Analytical Findings

The analytical findings are categorized into different sections based on the analysis' scope: statistical analysis, sentiment analysis, exploratory data analysis, data reliability, and regression analysis.

Statistical Analysis: This report employs key statistical tools to uncover intricate relationships within the data. Regression analysis gauges the influence of the loyalty on spending score and income fig.1 Based on these findings, it's evident that spending score and remuneration strongly influence loyalty

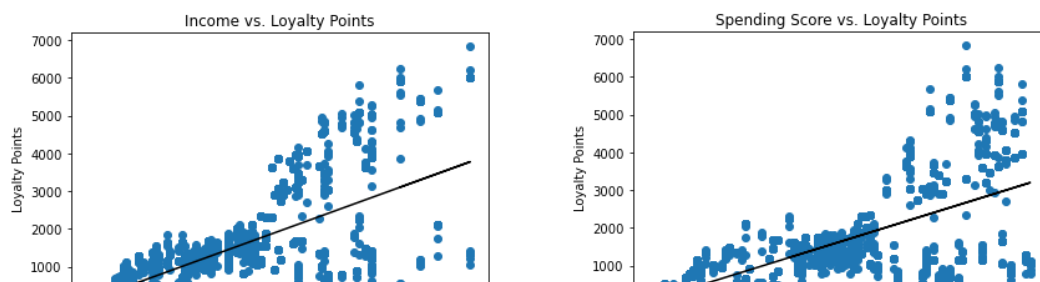
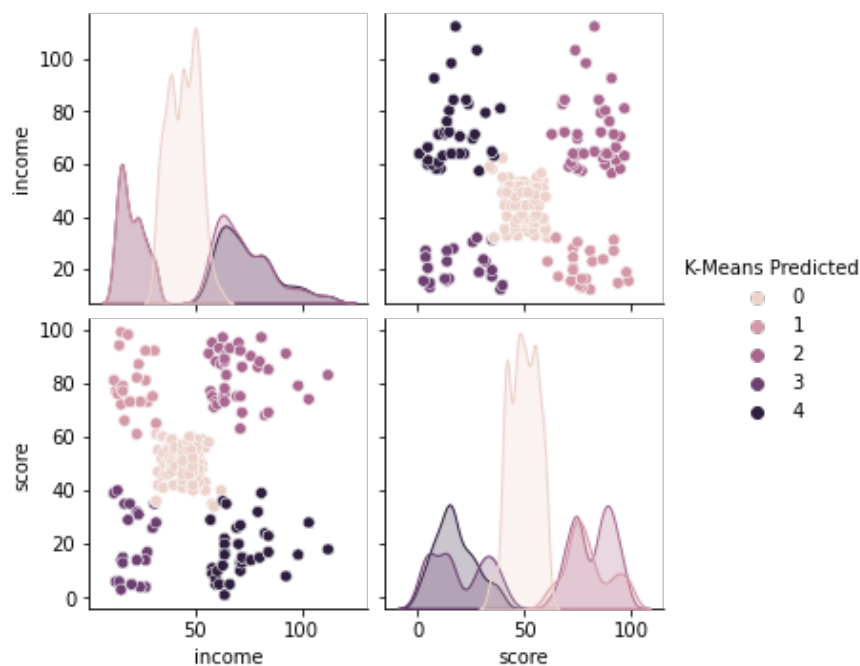


Figure 1 (a). Income relationship with loyalty points, (b) spending relationship with loyalty points

points accumulation, whereas age plays a lesser role. Further research is needed to explore how additional factors, like purchasing habits or types of transactions, affect loyalty point accrual.

1. High income, High spending
2. High income, Low spending
3. Low income, High spending
4. Low income, Low spending
5. Moderate income, Moderate spending



Natural Language Processing (NLP) and frequency distribution helped interpret customer sentiments and identify frequently used words in the reviews and summary in form of wordcloud element in fig.3.

Figure 3. wordcloud of frequent words in Reviews and Summary

Sentiment Analysis: An exhaustive analysis of customer reviews, performed using NLP, categorized sentiments as positive, neutral, or negative as shown on fig.4. This process revealed prevalent themes in the dataset's reviews and summaries, highlighting aspects like product quality, unmet expectations, product design, value for money, and functionality. Moreover, it indicated that the reviews tended to maintain a neutral position, with promising potential to increase positive sentiment in the future.

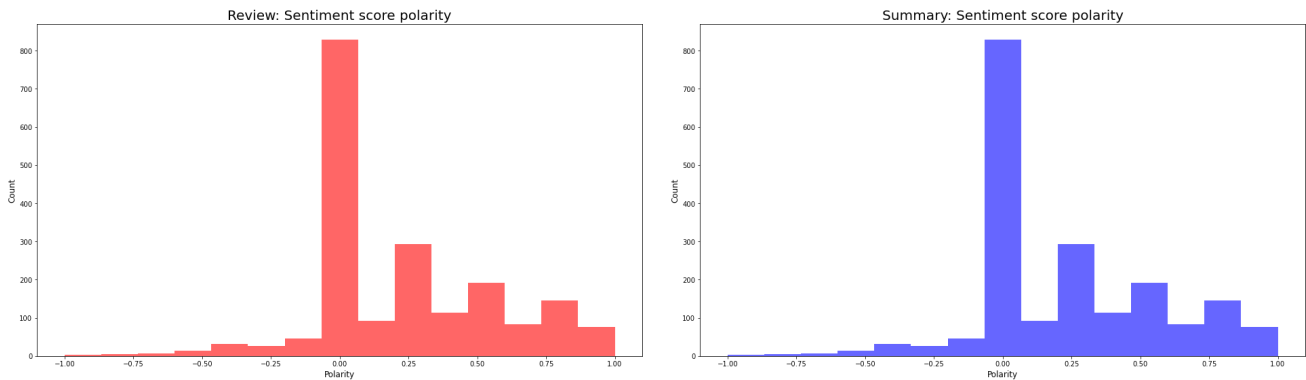


Figure 4. Sentiment score on Review and Summary

Exploratory Data Analysis (EDA): EDA was performed on the sales data to unearth key patterns and relationships. This step included studying correlations between regional and global sales, sales distribution across products and platforms, and identifying best-performing products and platforms as shown in fig 5. The insights gained from EDA can guide data-driven decision-making and future sales strategies.

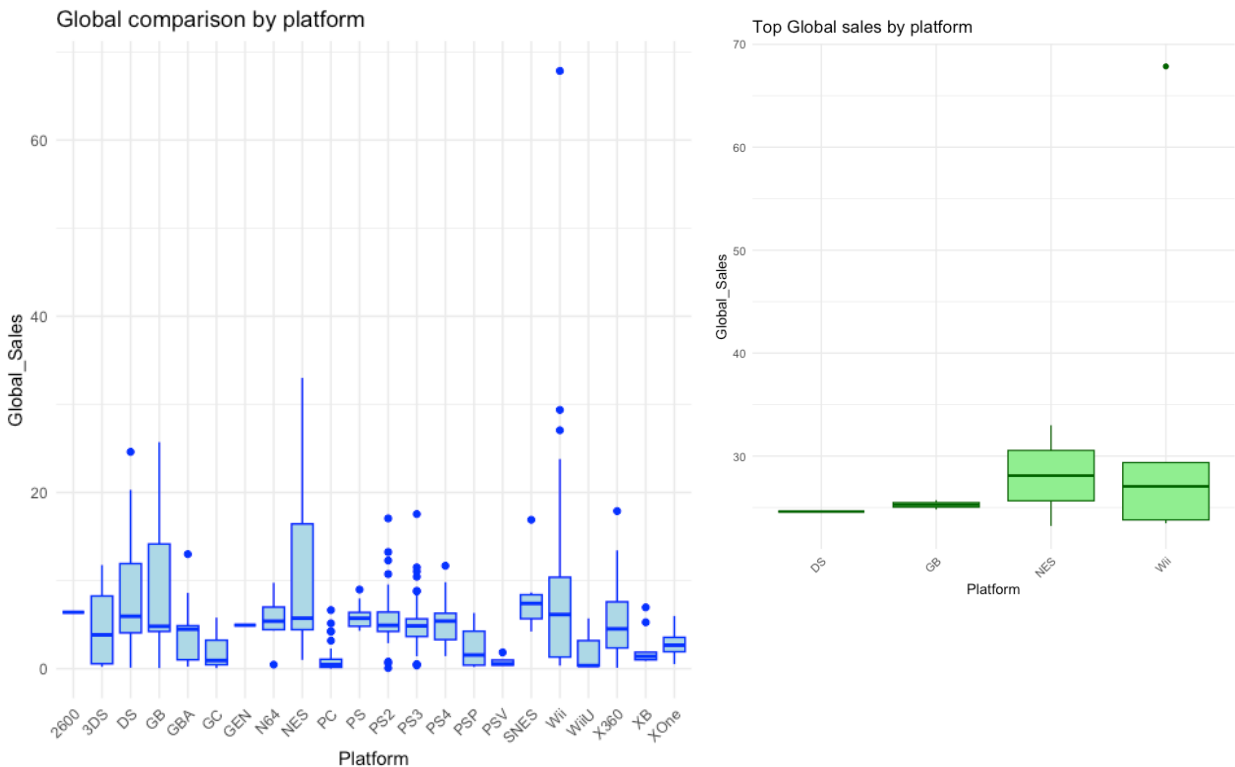


Figure 5. (a) Global comparison by platform, (b) Top platform global

Data Reliability: Data reliability we assessed with statistical tests like the Shapiro-Wilk test, skewness, kurtosis, and correlation matrices. Visual representations as shown in fig.6, such as scatter plots with trend lines, further corroborated the data's reliability. Our analysis involved scatter plots and histograms to explore relationships between sales regions, understand sales distribution across global, North America, and Europe markets, and compare sales performances across gaming platforms and products. Positive correlations between global and regional sales were observed, indicating successful regional sales tend to translate to global success. Box plots identified potential best-performing platforms and products, and outliers were identified for further investigation. These insights will guide Turtle Games' sales department in optimizing marketing strategies and improving sales performance across different markets and platforms, ensuring data-driven decisions are reliable and effective.

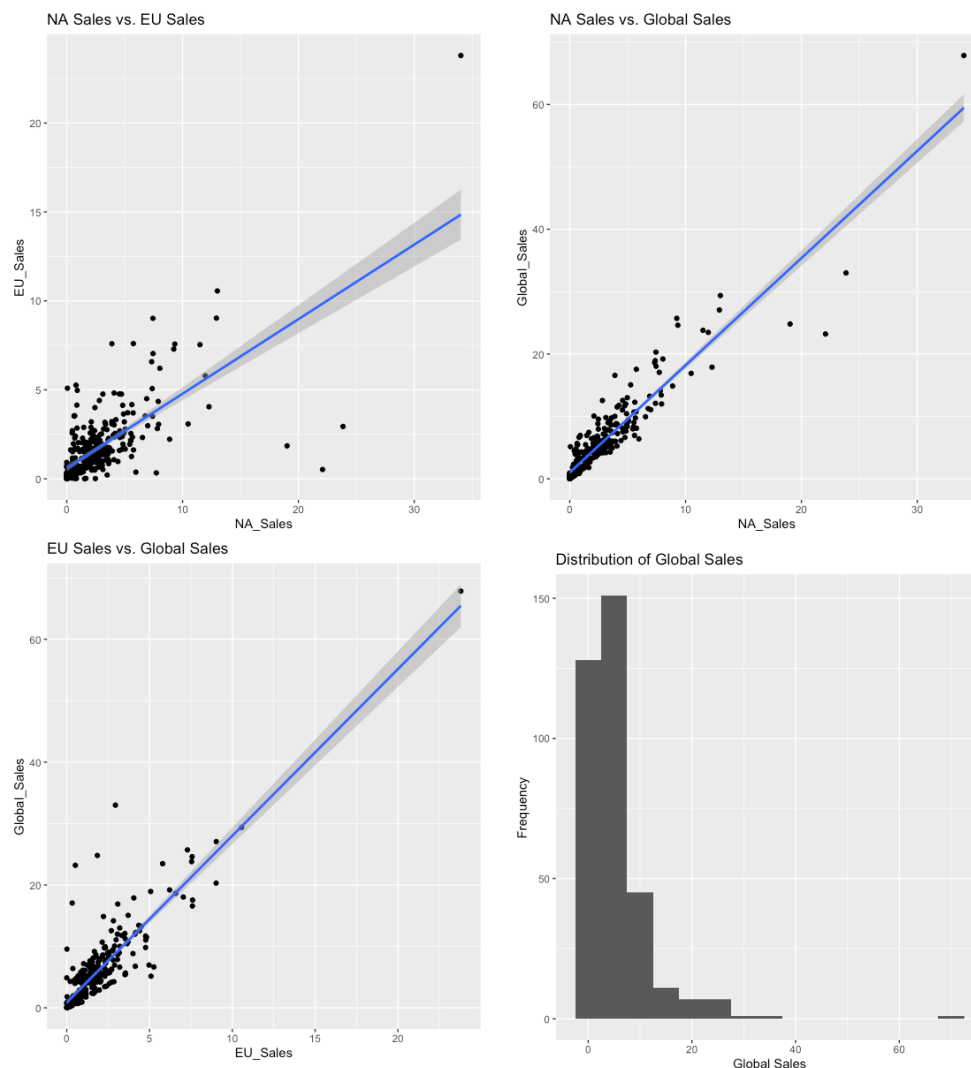


Figure 6. Data reliability

Linear Regression Analysis: This report includes a multiple linear regression model that predicts global sales based on sales in Europe (EU_Sales) and North America (NA_Sales). The model is highly accurate, accounting for 97% of the variation in global sales.

Conclusion

Drawing from the analysis, several key recommendations emerge. Customer satisfaction, achieved through offering quality products that meet expectations, is a significant driver of positive sentiment and, consequently, sales. Emphasis should be placed on sales growth in North America and Europe, given their substantial influence on global sales.

It's important to note that continuous refinement and expansion of predictive models are crucial to adapt to evolving market dynamics. Through the application of robust analytical techniques and data-driven strategies, Turtle Games can remain competitive and profitable in the ever-changing gaming industry.

The report encapsulates an exhaustive analysis of Turtle Games' sales performance and customer behavior. Employing multiple datasets and leveraging advanced analytics, the study has identified crucial factors impacting sales. These findings underscore the importance of customer satisfaction, product quality, strategic marketing, and robust sales strategies in key regions such as North America and Europe.

Moreover, the study emphasized data reliability and the significance of accurate predictive modeling in strategic decision-making. With a focus on continuous model refinement and expansion, Turtle Games can adapt and thrive in an evolving marketplace. The analytical approach adopted in this study lays a foundation for future data-driven decision-making, paving the way for Turtle Games' sustained success.