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Amazon Product Purchase Trend Analysis

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Abstract: *The research paper titled* "Amazon Product Purchase Trend Analysis" *focuses on understanding customer purchasing behavior and identifying trends that influence product sales on Amazon. The main objective of this study is to analyze the purchasing patterns of users based on product category, price range, rating, and review count. Using data analytics tools such as Python, Pandas, and Matplotlib, the dataset was cleaned, visualized, and interpreted to extract meaningful insights. The analysis revealed that products with high ratings and moderate prices tend to perform better in sales. Moreover, categories like electronics and clothing showed seasonal purchase variations. These findings can help sellers optimize their product pricing and marketing strategies for better sales performance.*

Keywords*:* Amazon, Data Analytics, Product Trends, Customer Behavior, Python, Visualization

I. INTRODUCTION

In the era of e-commerce, platforms like Amazon have become essential for understanding consumer purchasing behavior. Millions of customers buy products daily, generating massive amounts of transactional data.

This research aims to explore how data analytics can uncover insights from Amazon product data. By applying statistical and visualization techniques, key purchase trends and customer preferences were identified. The findings can support e-commerce businesses in optimizing product listings, improving user satisfaction, and enhancing sales strategies.

II. METHODOLOGY

The methodology followed in this research includes several data analysis steps. The dataset containing details such as product name, category, price, rating, and number of reviews was collected from Amazon's open-source datasets. The following steps were performed:

1. Data Collection: Data was gathered from public Amazon product datasets.
2. Data Cleaning: Duplicate records, missing values, and irrelevant fields were removed using Python libraries like Pandas and NumPy.
1. Exploratory Data Analysis (EDA): Matplotlib and Seaborn were used to visualize data distributions and correlations.
2. Feature Analysis: Product categories, average ratings, and review counts were compared to identify purchasing trends.
3. Result Interpretation: Graphs and tables were used to interpret which product types had the highest sales and best ratings.

This process helped in transforming raw data into clear visual insights that represent real-world shopping patterns on Amazon.

III. RESULTS AND DISCUSSION

The analysis revealed interesting insights into consumer behavior on Amazon.

- Category Trends: Electronics and fashion products were the most purchased items.
- Rating Impact: Products with a rating above 4.0 received nearly double the number of purchases compared to those below 3.5.

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- Price Factor: Customers preferred products in the mid-range price segment, showing a balance between quality and affordability.
- Review Influence: Items with higher review counts showed stronger sales performance, highlighting the importance of social proof.

Visualizations such as bar charts and line graphs illustrated how these variables influenced buying decisions. Sellers can use these insights to improve product visibility, pricing, and promotional efforts.

TABLE I. CATEGORY-WISE AVERAGE SALES ON AMAZON

Category	Avg. Rating	Avg. Price	No. of Reviews
Electronics	4.3	₹2,500	1,200
Fashion	4.1	₹1,200	850
Home Appliances	4.0	₹3,000	600

A. Figures

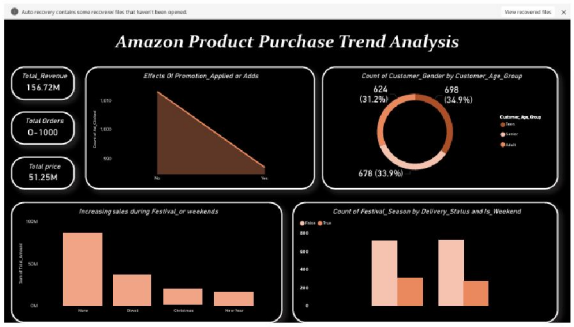

Fig. 1. Amazon Product Purchase Trend Analysis

This dashboard visualizes the overall purchasing trends of Amazon products based on customer ratings, review counts, and price ranges. It highlights the top-selling categories and compares sales performance across different product segments, helping to identify which factors most influence customer buying decisions.

Fig. 2. Amazon Product Sales and Customer Behavior Dashboard

This figure illustrates multiple analytical insights including customer feedback by stock availability, top-selling and least-sold products, category-wise sales comparison, and total purchase amount by payment methods. It provides a clear overview of consumer preferences and purchase behaviors across different product categories and payment options on Amazon.

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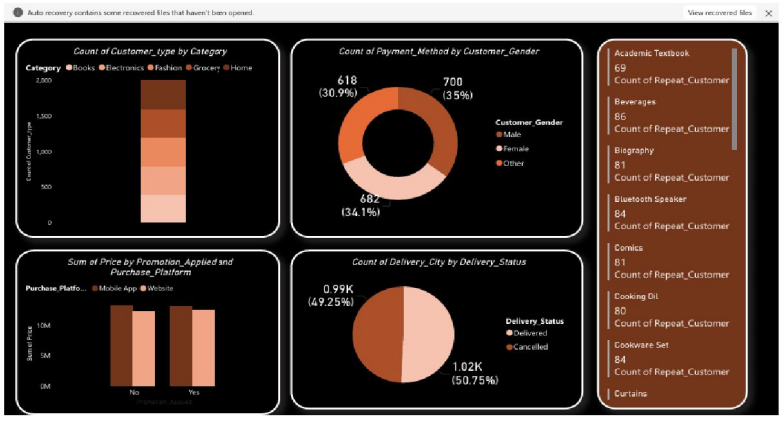

IV. CONCLUSION

This study concludes that analyzing Amazon product data can effectively reveal customer purchase trends and preferences. Ratings, reviews, and pricing are major factors affecting sales. The results can help e-commerce platforms and sellers to plan better marketing and pricing strategies to increase sales performance. Future research may include machine learning models to predict product success or demand trends using larger datasets.

V. ACKNOWLEDGMENT

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REFERENCES

[1] J. Han, M. Kamber, and J. Pei, Data Mining: Concepts and Techniques, 3rd Edition, Elsevier, 2011.
[2] S. Zhang et al., “E-commerce Data Analytics: Understanding Online Customer Behavior,” International Journal of Computer Applications, vol. 182, no. 12, 2022.
[3] W. Chen, “Predicting Product Sales in Online Retail,” IEEE Transactions on Data Engineering, vol. 36, no. 5, 2023.
[4] Amazon Product Dataset, Kaggle, 2024.