



WE MADE IT marketing report

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Project Summary

This report presents the methodology and recommendations for increased revenue generation including marketing efforts and inventory management based on sales data from January 2018- December 2018. This analysis was designed to explore the most profitable products and recommended changes to product offerings including

1. Differences in profitability between male and female patrons
2. Customer ordering behavior (becoming members, web vs mobile purchase, etc.)

Data was retrieved from Kaggle <https://www.kaggle.com/datasets/mervemenekse/ecommerce-dataset> and contains data from a 2018 e-commerce business. Data was cleaned and explored in R Studio. Visualizations were created in Microsoft Excel.

Hypothesis Testing

1. Hypothesis: There is a difference in profitability between male and female patrons
2. Hypothesis: Customers are more likely to order on mobile than web platforms
3. Hypothesis :Electronics will be the most profitable category

Report

The purpose of this report is to provide statistical analysis that will lead to an enhanced understanding of revenue drivers at WE MADE IT, INC.

Analysis of profitability and customer behavior

Data was exported from the Shopify platform which tracks each transaction by order timestamp. Some information was not provided for security, so we were unable to analyze data by order number. Nevertheless, data on aging, gender, profitability, and shipping allowed for the generation of useful insights and thoughtful recommendations.

The data was analyzed for seasonality to determine opportunities to increase revenue. The data shows the expected decrease in e-commerce following the Holidays and begins to increase in March. Sales and profit mirror closely with the exception of September and October when the increase in sales seems to have a dampened increase in profit. There is a final increase in November coinciding with Black Friday and the Holiday gifting season. A closer analysis of the specific products will provide additional insight into profitability.

Profitability Analysis

Annual Profit (2018)

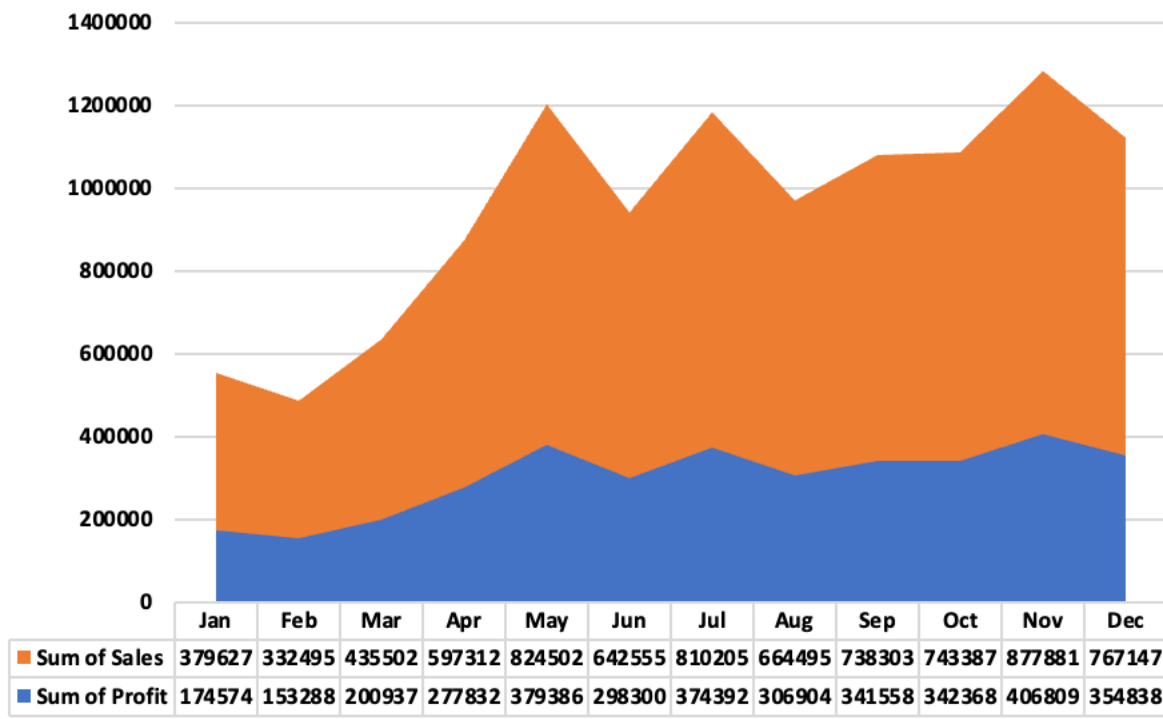


Figure 1: Annual Profit

Analyzing profit by product category highlights the importance of fashion for WE MADE IT, INC. This product consistently drives revenue following the seasonal e-commerce trends seen below. The profit margins for all product groups are between 44% and 48% but the change in profit is largely attributable to the quantity of products sold in each category (Figure 2).

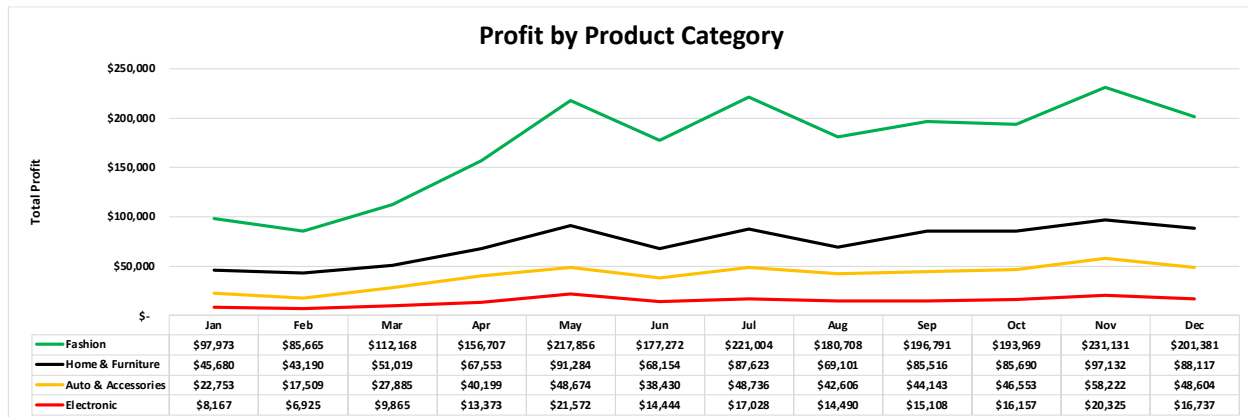


Figure 2 Monthly Profit by Product Category

The pareto graphs below illustrate product segmentation of profitability. Fashion accounts for nearly 60% of total profit. The top five products (T – Shirts, Titak watch, running, shoes, jeans, formal shoes, shirts) account for 47% of total profit. Specifically T-shirt sales accounted for nearly 10% of total profit in 2018 (Figure 4).

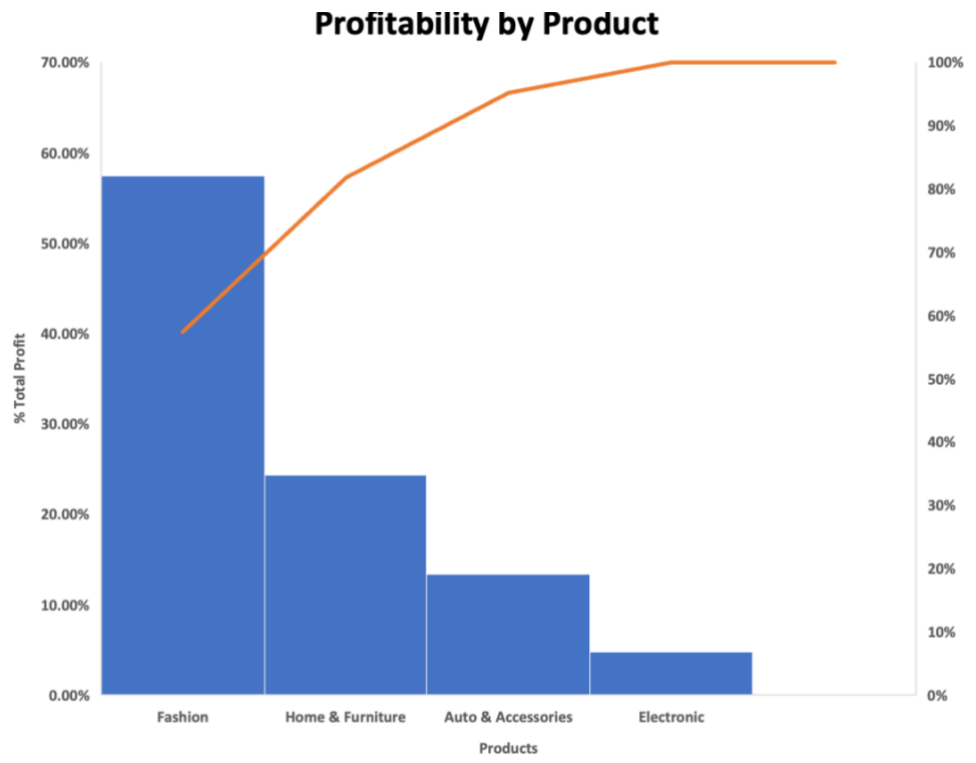


Figure 3- Pareto Chart Profit by Product Category

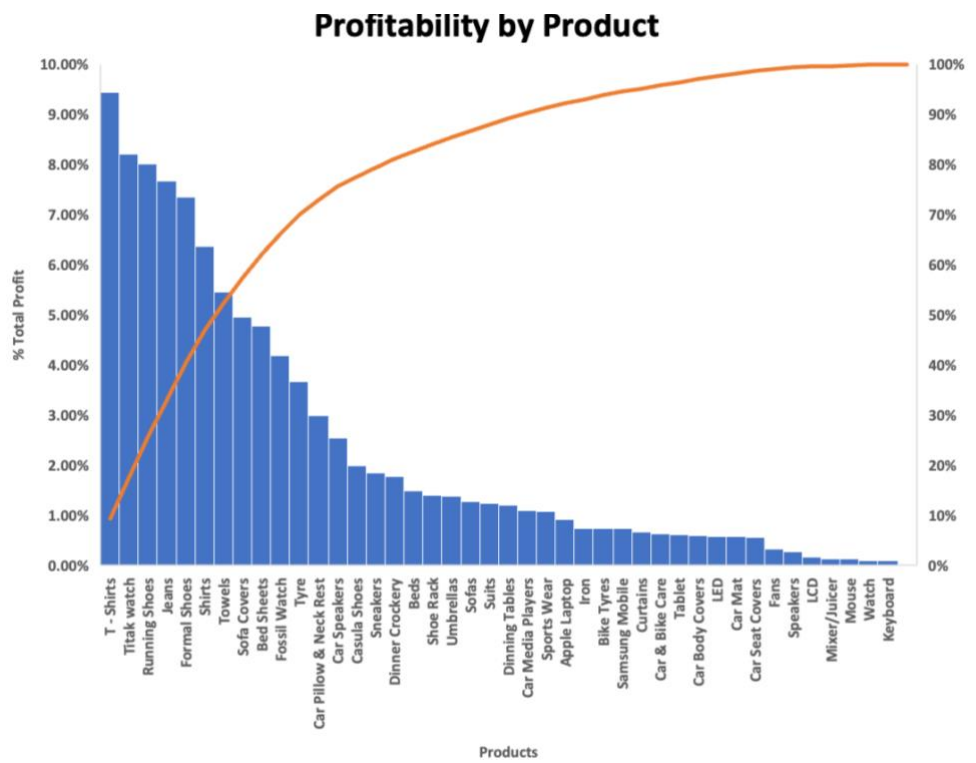
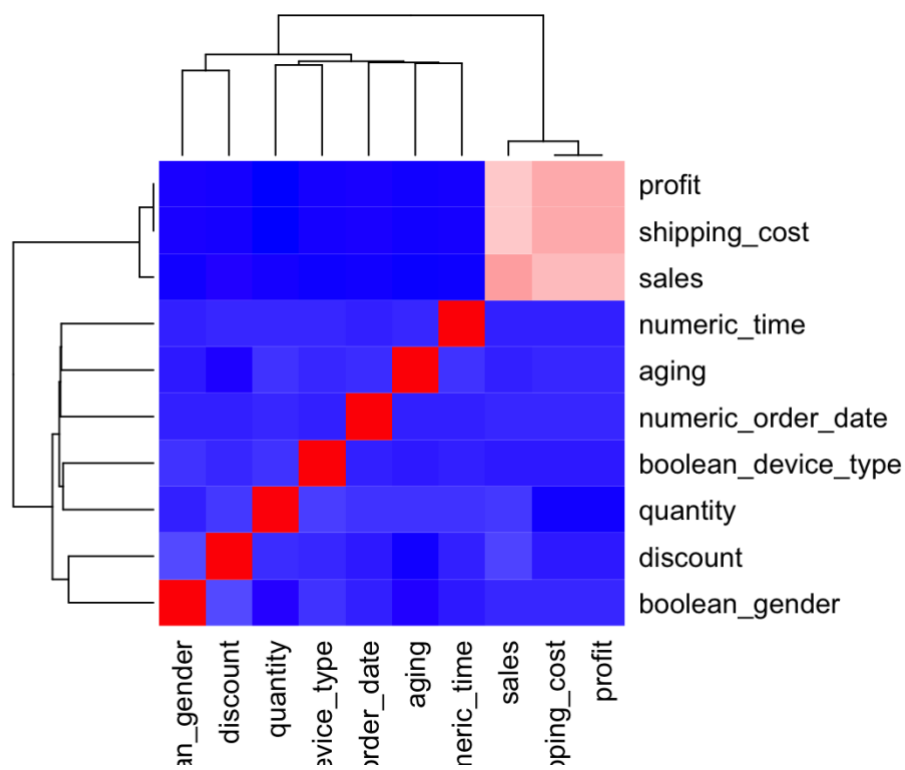


Figure 4 Pareto Chart Profit by Product

Gender Matters

While the difference in profitability between genders failed to reach statistical significance ($p=0.08$) using linear regression models, total **sales for male patrons were statistically significantly higher than for female patrons** using linear regression modeling and profit reached statistical significance using Welch Two Sample t-test ($p < 0.01$). It is likely that gender difference are functionally significant for WE MADE IT, INC. Due to the inherently high correlation between sales, profit, shipping costs, and quantity, multivariable regression models were not used (Figure 5).

Variance between genders was not assumed to be equal and therefore the Welch Two Sample t-test was performed for sales and profit. While sales is significantly affected by gender using linear regression, confounding factors such as wholesale price, shipping costs, and holding costs affect profit. Therefore additional analysis of products purchased (below) helps to provide additional insight.



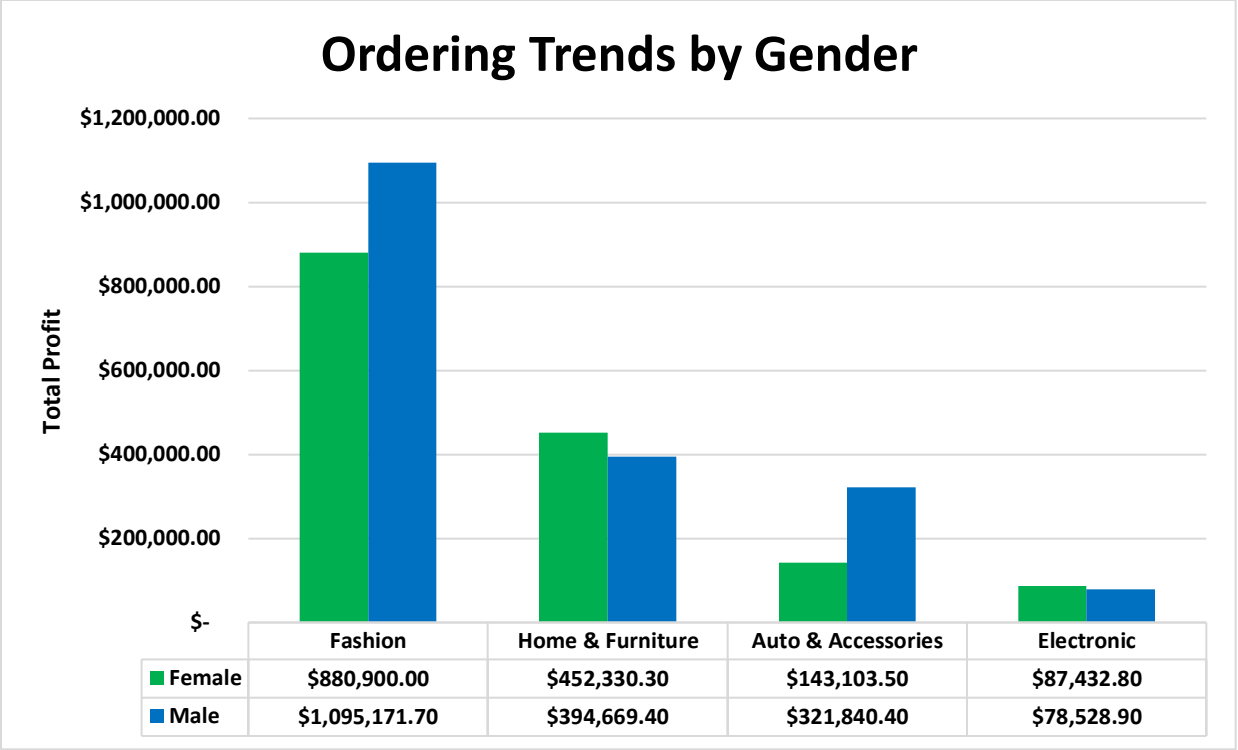


Figure 6: Ordering Trends by Gender

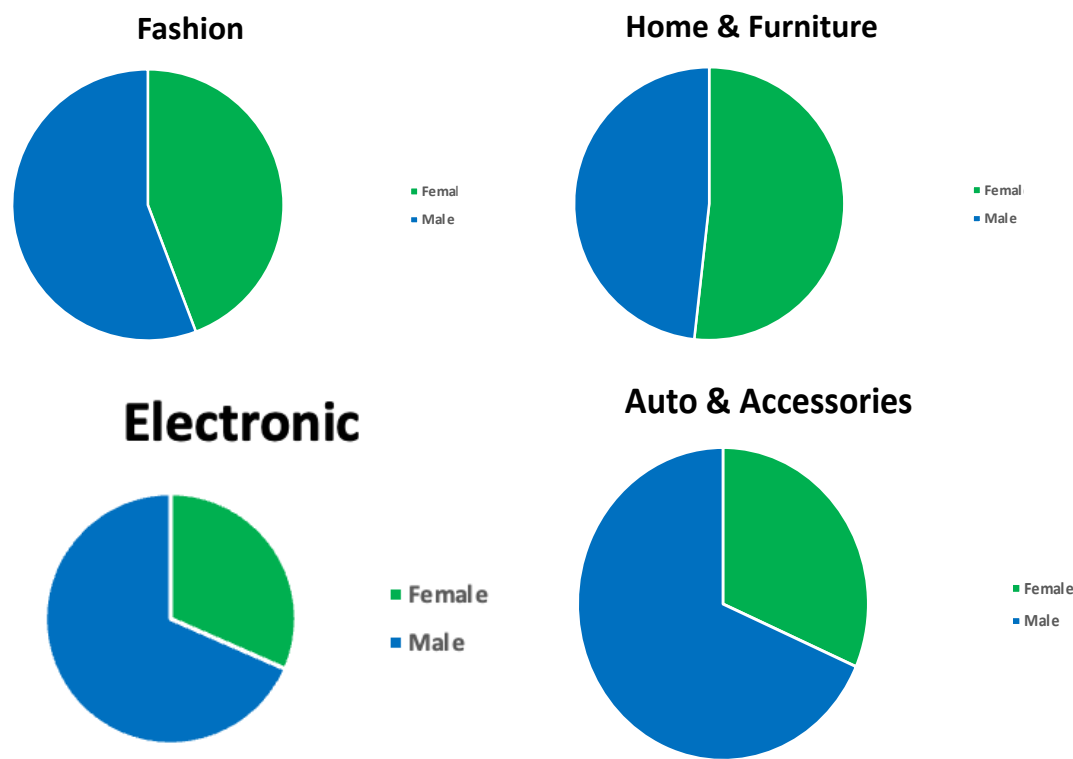


Figure 7 - Profit by Gender and Product Category

Conclusion

The analysis highlights the buying preferences of customers. While women significantly contribute the profits of WE MADE IT, INC, men are more likely to make a purchase (Figure 6, Figure 7). Fashion is the most successful product category and there are opportunities to focus on increasing revenue there (Figure 3, Figure 4). Additional analysis included preference of payment method, membership, and site access. Customers preferred to pay by credit card via the website, and the overwhelming majority of customers were members. Additional demographic statistics such as age and location would help to create more personalized market efforts.

This report presents the methodology and recommendations for increased revenue generation including marketing efforts and inventory management based on sales data from January 2018- December 2018. Based on the analysis detailed above there are three recommendations:

Recommendation 1: Prioritize T-SHIRT SALES

Focus marketing efforts on T-shirts and prioritize t-shirt sales to reduce aging times to under 4 days.

Fashion is the most profitable category with T-shirt sales accounting for 10% of total profit. Focusing on excellent customer service around T-shirts could increase the probability of repeat customers.

Recommendation 2 : Market to men.

Men account for 54% of the customer base. While average spend per person is the same between male and female patrons, male patrons spend 326,000 more than female patrons during the same time period. Male patrons outspent female patrons in the categories of Auto & Accessories and Fashion.

Recommendation 3: Loss Leaders

Use watches and car mats as loss leaders to attract new and returning customers. The profitability of watches and car mats is low and does not contribute to overall profitability. The opportunity for revenue growth is among the lowest and the volume of sales is relatively low as well. Based on the low wholesale price, these items present excellent opportunities for discounts, buy-one-get-one promotions and giveaways to promote T-shirt and shoe sales.

Hypothesis Testing Outcomes

These findings were informed by the initial hypothesis testing as follows:

Hypothesis 1

H0: There is no statistically significant difference between profit from male and female patrons

H1: There is a statistically significant difference between profit of male and female patrons

We must reject the null hypothesis. We can conclude with 99% certainty that male customers are more profitable to WE MADE IT, INC

Hypothesis 2

H0: There is no statistically significant difference between web and mobile purchase counts

H1: There is a significant difference between web and mobile purchase counts

We must reject the null hypothesis. We can conclude with 99% certainty that customers prefer the make purchases via the WE MADE IT, INC website.

Hypothesis 3

H0: There is no significant difference in the profitability of product categories

H1: There is a significant difference in the profitability of product categories

We must reject the null hypothesis. We can conclude with 99% certainty that the fashion category is the most profitable