

**BUSA1000 INTRODUCTION TO DATA, ANALYTICS  
AND PEOPLE**

# **TrueRide Bicycles**

**Business  
analytics report**



Link record:

<https://echo360.net.au/media/69791398-44d2-4b6d-a2a3-c4f4cf3d9c02/public>

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# INTRODUCTION

TrueRide Bicycles (TRB) is a legacy brand initially as a small family-owned business, founded over 40 years ago in North America. It has since expanded into a global operation, with branches selling products in several countries. Being an international business in an increasingly competitive market, data-driven insights are essential for guiding business strategy and maintaining a competitive edge. As part of this transformation, the sales data from Q1 2020 to Q1 2024 has been analyzed using Tableau to uncover key insights on product performance, customer segments, geographic sales trends, and profitability. This report presents a data-proven summary of sales patterns and customer behaviors across regions and product categories, supported by visual analytics. This report aims to support TRB's strategic decision-making with evidence-based recommendations.

# Executive Summary

The report showed an analysis of TrueRideBicycles' (TRB) business performance in a 4 year time span from Q4 2020 to Q1 2024, focusing on key areas including customer purchasing behaviour, regional performance, and product profitability. Provided data-driven insight to support strategic decision-making through descriptive analytics aimed to boost profitability, performance and overall success.

The findings reveal that the total sales performance in 2023 is \$7.4 million, peaking in Q4 with over \$2.5 million in revenue. Regionally, Canada and New Zealand are reported to be the TRB's highest sales and profits area, in contrast to the United States underperformance with the lowest sales and profit. Additionally, customer segments based on Recency, Frequency, and Monetary (RFM) analysis identified Big spender and Most valuable groups responsible for most share of sales. TRB's core revenue source stems from Road and Mountain Bike categories. Although Mountain-200 took the lead as the top-selling model, Road bike emerged as the most profitable subcategory overall. In terms of sales amount, Accessories consistently ranked in the top units sold, yet only account for a small portion of revenue. Same patterns of cost occur with Clothing and Components indicating poor ROI.

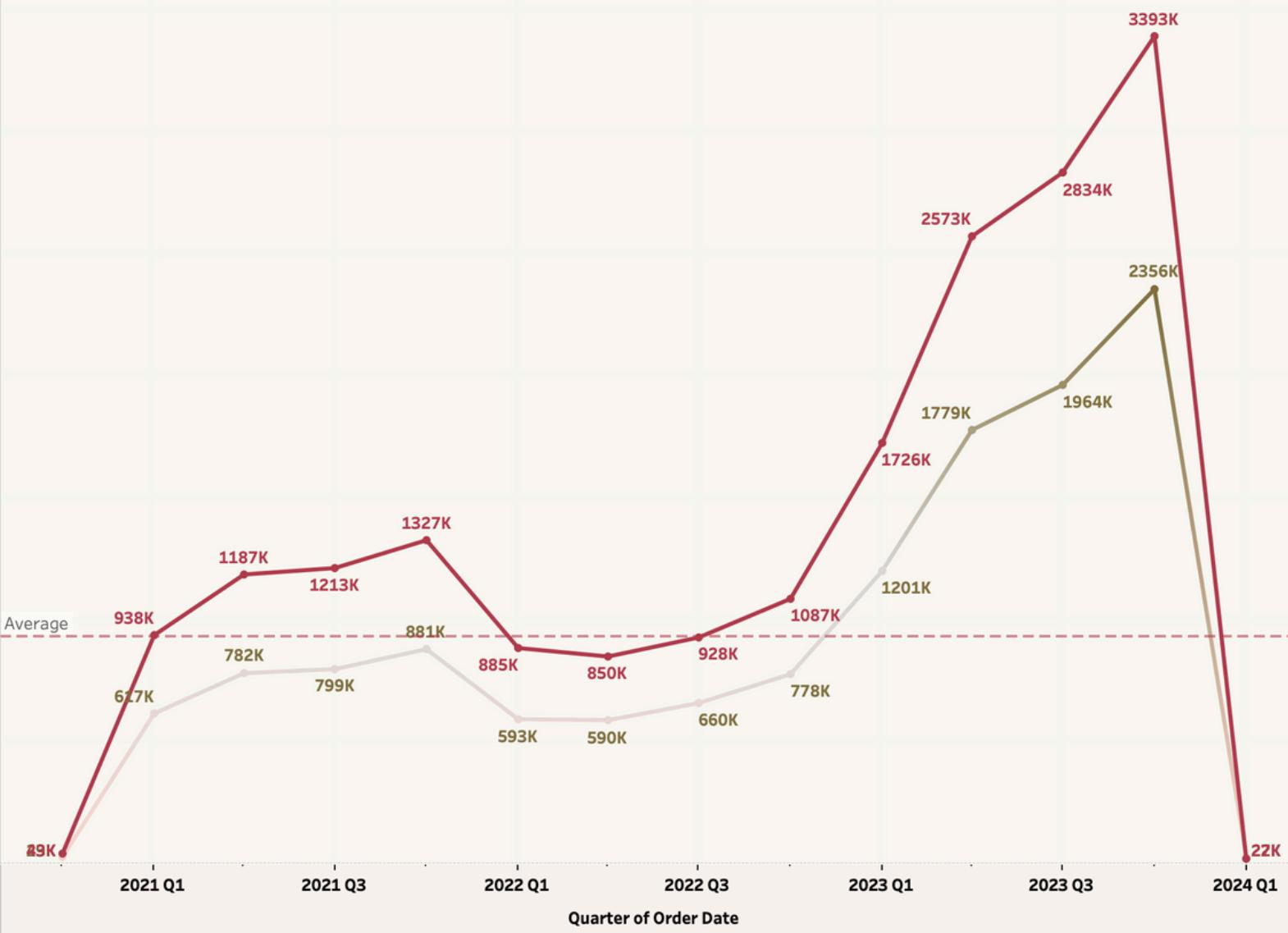
## Company Stakeholders

- Staff of TRB
- Top management
- Marketing Faculty (focus on Customer analysis)

# Our overall performance highlight

**Sales, Total Cost and Profit Across Years and Quartiles.**

**Total Profit and Total Cost**  
from 2020 Q4 to 2024 Q1



**FIGURE 1**

Based on data from 2021-2023 and their quarters, insight can be gained on TRB's sales and respective profit levels.

# Sales Amounts performance.

*A summary of the allocated sales amount for the following year.*

The most recent year's (2023) **Quarter 4 was TRB's highest sales-generating year with \$17,955,734.96**. This is in comparison to **\$6,417,876.50** in 2022, and **\$7,799,952.03** in 2021 (by year).

The first quarter of 2023's sales was pretty average with a value of \$2,948,652.21, however, the second quarter saw a complete skyrocket in sales that just increased more and more over the months. Quarter 4 held the largest value of sales in any quarter of any year with the value of \$5,790,947.33. (by quarter)

**Best performance year based on sales amount and profit margin.**

Overall, the company has demonstrated strong performance over the years through their consistent generation of positive profits. This elucidates that TRB product sales have effectively covered production costs and delivered sustainable profitability.

**In the peak of 2023, the difference between Quarter 1 and Quarter 4 demonstrated an astonishing 195% increase in sales amounts.**

# Overall profit per year Breakdown

**A summary of net profit margin over 5 years:** although the difference between 2022 and 2023's ratios are 0.2%, when it comes to handling large sums of money, these small percentages do become quite drastic. In conclusion, 2023 was TRB's best-selling year, however, 2022 was TRB's most profitable year.

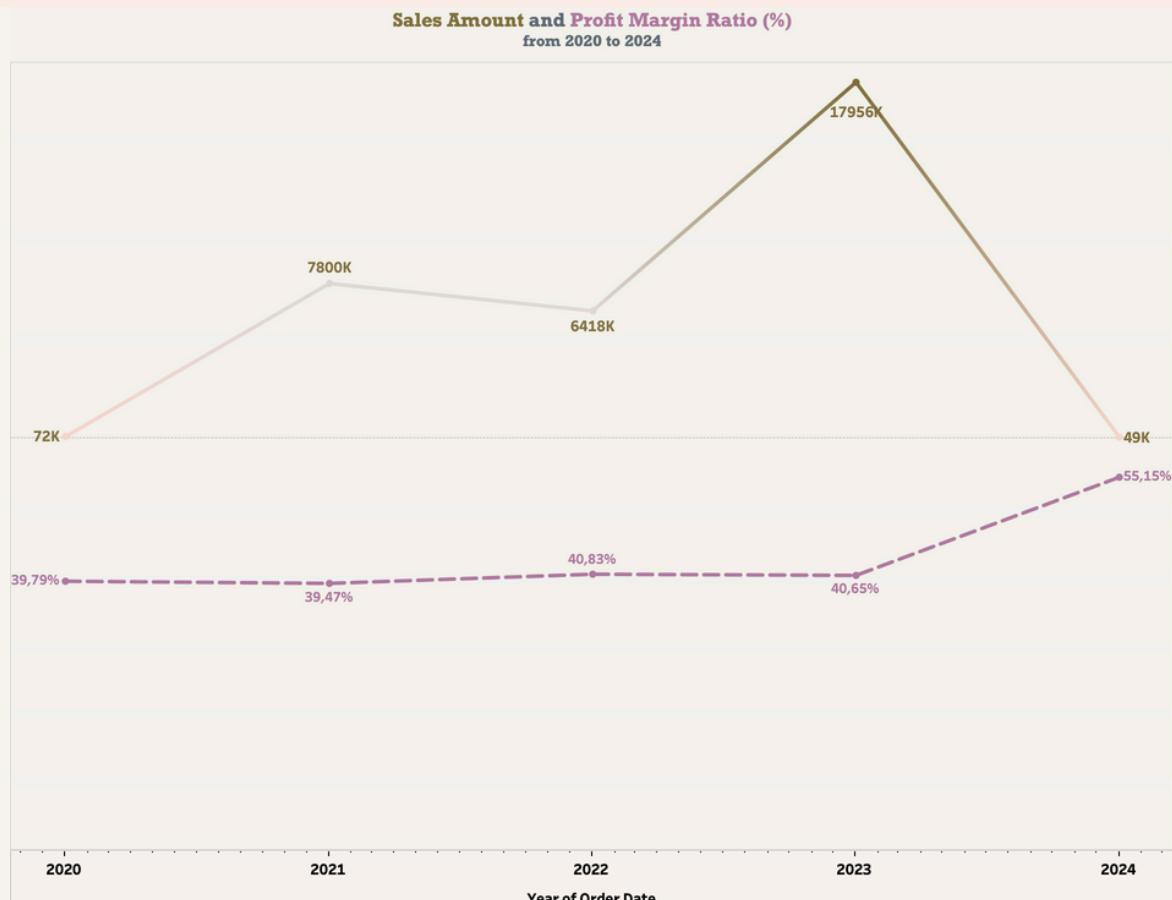


FIGURE 2.

- In terms of overall profit per year, 'Figure 2' shows the sales amount of \$7,800,000 in 2021, \$6,418,000 in 2022 and \$17,956,000 in 2023.
- From inputting these values into the net profit ratio:  
$$\text{net profit} / \text{total sales} \times 100$$

=> 2022 is actually TRB's best-performing year in terms of the amount of profit generated on sales. Although 2022 brought about the least sales, their high profit rate could be attributed to the low tax amount on their limited sales.

# Top performing region market

**TRB's products are sold in Belgium, Canada, Italy, New Zealand, Spain and the United States.**

This induces a diverse range of sales volumes and understanding on product performance based on different regions and perhaps their qualities.

From the years of 2021-2023, **Canada (\$7,580,601)** and **New Zealand (\$7,110,374)** held the highest sales volumes. Surprisingly last was the **United States of America (\$1,520,549)**. The United States having the lowest sales is unexpected because TRB originally began as a locally owned business in North America. **However, their rapid expansion over various borders and into other regions, explains their great success internationally.**

The USA's underperformance (**\$860,602.99**) in comparison to Canada's (**\$4,015,528.81**) in profit traces back to its low sales volume and potentially indicates to TRB **a need for a market-specific strategy refinement**. Values for each country's profit levels are clear in 'Figure 2'.

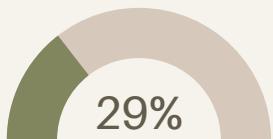
**Costs mirrored the sales and profit trends:** Canada (\$4,389,761) and New Zealand (\$4,214,678) recorded the highest costs, indicating the larger operations and demand in these markets.

The USA brought about **the lowest costs (\$870,411)** and though this may seem good for TRB, it demonstrates problems such as **lower sales and profit** levels compared to other regions, possibly highlighting deeper-rooted issues such as underinvestment or market saturation.



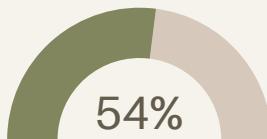
# Customer segment analysis

*Customer Demographic and Customer Behavior.*



## EDUCATION: BACHELOR

High level of education make up of large proportion.



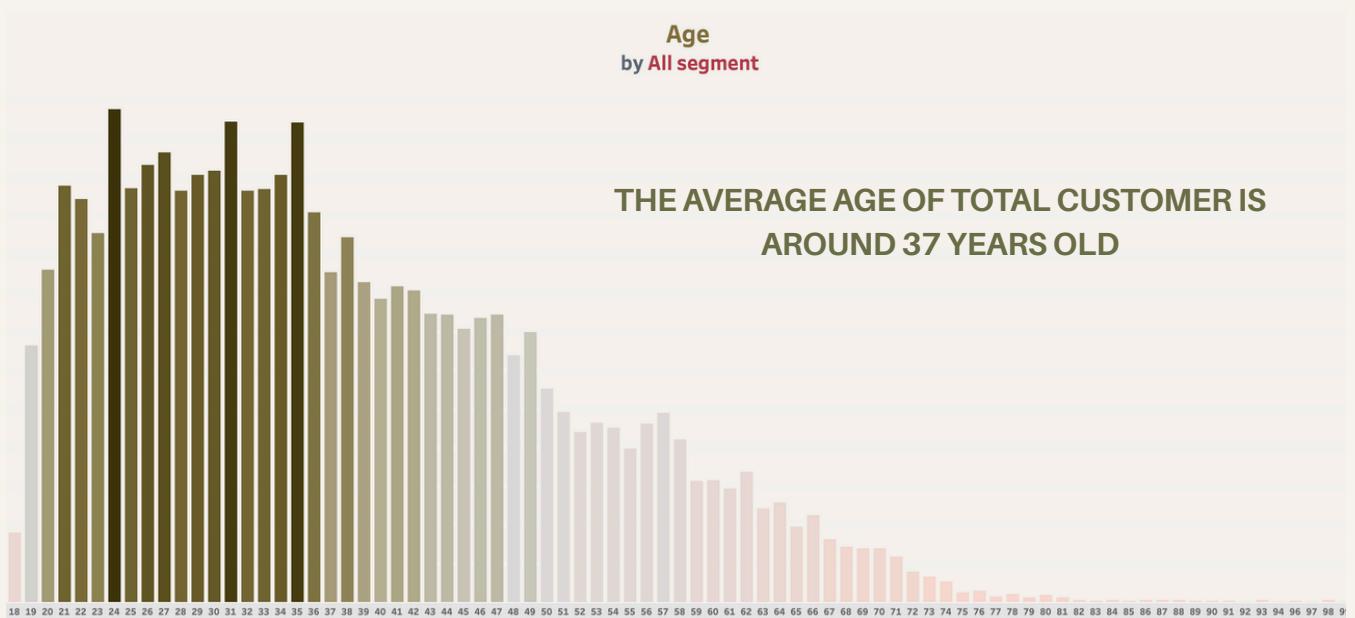
## MARITAL STATUS: MARRIED

Write an observation about the competitor.



## NUMBER OF CHILDREN AT HOME: 0 (#)

Households without young children or dependents constitute nearly 60%, the majority of TRB's customers typically have, or have only one, young child.



- The majority of customers fall between **24 and 38 years old**, with peak at 24, 32, 35 => These age groups likely represent your **core target audience**.
- There's a steady **decline** in customer numbers **after age 40**, especially after age 55.
- Very few customers are above 70 years old**, indicating limited engagement from older demographics.

# Differentiate segments based on average RFM Overall Score.

*The marketing adage that "80% of your business comes from 20% of your customers".*

Segment	Recency (R)	Frequency (F)	Monetary (M)	Description
Loyal Customers	2, 4	4	2, 4	Repeated renewals, may not spend the most per order but very consistent.
Most Valuable	4, 5	3, 4	4, 5	Frequent, recent, and high-spending buyers — top revenue contributors.
Big Spenders	2, 4	2, 4	4, 5	Spend a lot in a few transactions; infrequent but high-value purchases.
At-Risk Customers	1, 2	4, 5	4, 5	We Are frequent, big spenders — but haven't purchased recently.
New Customers	4, 5	1, 2	1, 3	Very recent buyers; still early in customer lifecycle.
Churned Customers	1	1	1	Low scores across the board — likely lost or disengaged.

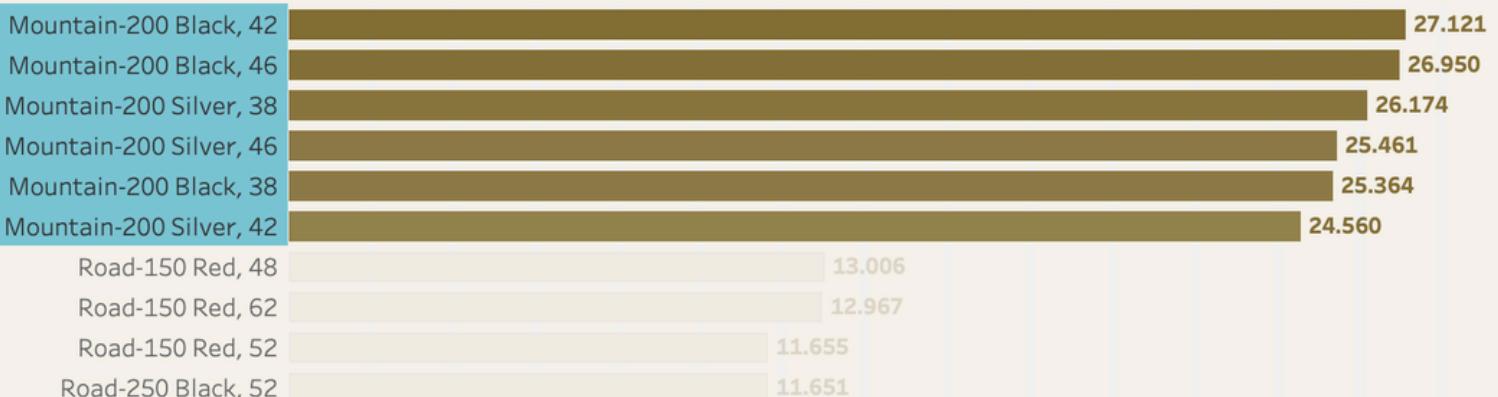
- Segmentation of customers behaviours into different segments based on their 3 main **Recency, Frequency and Monetary** score.
- Scores ranging from 1 (lowest value) to 5 (highest value) for each factor, understanding how recently customers made orders, how frequently they purchase those products, how much they're willing to pay for those products.
- Based on that, our brands are able to design a framework for each segment and define which are the main problems experienced by specific customers.

# TOP HIGH-VALUE SEGMENT

The top-performing customers from these segments include customer IDs: #12301, #12132, #12308, #12131, #12300, and #12321. Together, they contributed over > \$14,000 in total sales.

## Top best-selling product name filtered by **Bikes** for **Big Spenders & Most valuable** segment

### Product Name =



## Top product name filtered **Accessories** by Total Purchase for **Big Spenders & Most valuable** segment

### Product Name =



### Bike - Mountain Line (Mountain 200):

This product line performed particularly well, showing a strong variety in models and colors. The top-selling variants include:

- Black 46, Black 42
- Silver 38, Silver 46, Silver 42

The Mountain 200 line stands out not only for its popularity but also for maintaining a high profit margin, indicating its strong performance.

### Accessories

Accessories are another top-performing category and appear to be the main profit drivers for the business.

- Water Bottle - 30oz is the standout product with approximately 1,693 orders and a net profit margin of \$252,004, making it a highly efficient and valuable item.

Other high-margin items despite lower sales volume include:

- Mountain Tire Tube (Ranked #3)
- Patch Kit (Ranked #2)

# Sales report in each customer segment

Most valuable segment: Higher per customer value.

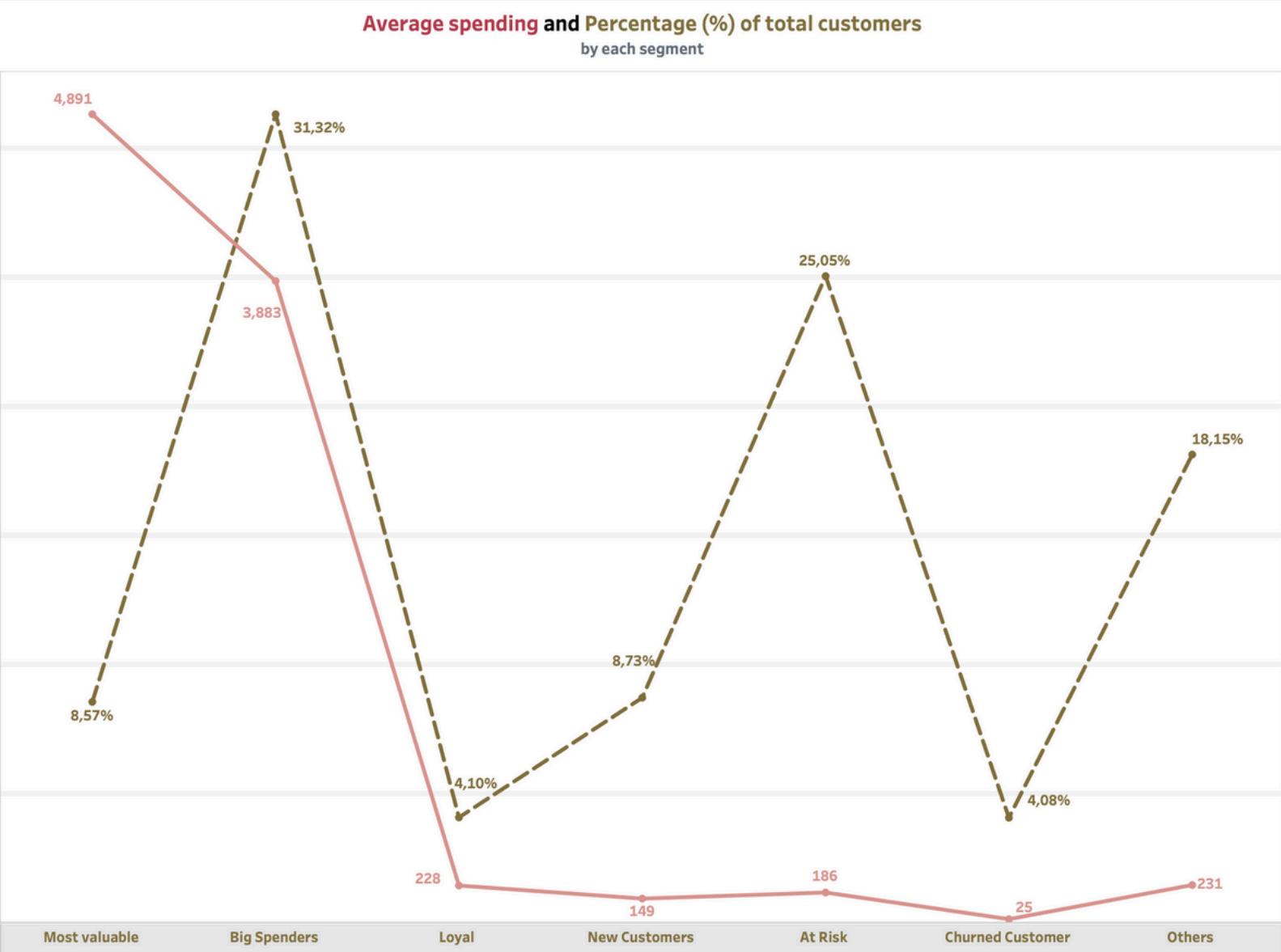


Figure 3: Average spending and percentage of total count of customers.

The **Most Valuable** customer segment accounts for only **around 8.57% (1,584 of the total customer base)**. However, this group generates the highest value on average, with an average order amount of nearly **\$4,900 per customer** — the highest among all segments.

> **Big spenders** drive the most sale amount. Largest high-volume segment, especially in the durable goods industry. Although their average spend is lower than Most Valuable, their **large count (31.32%)** brings in the highest total sale revenue for TRBs (22.47M).

# Customer segment Distribution

Overall, as much as **93.6% of the total sales amount comes from two premium customer groups:** 'Most Valuable' and 'Big Spenders,' with a total of over 7,200 customers. 93.6% of the total sales amount comes from just two customer segments: 'Most Valuable' and 'Big Spenders'. These two segments together represent only ~39% of the total customer base (about 7,200 customers), yet they contribute almost the entire revenue stream.

*Insight:"This indicates that TRB's business is heavily reliant on its premium customers. Targeted retention and value maximization for this group is absolutely critical."*



Figure 4: : Cummulative Customer Distribution to Sales Amount

# Loyal Segment highlighting:

*Looking at the customer table, we can see that in the Loyal segment, there are customers who made a large number of purchases (**up to 60-63 orders**).*

However, despite their high frequency, the total revenue these customers generated for the company is relatively modest—just over \$1,600.

⇒ This indicates that these customers tend to make frequent purchases of low-value items such as clothing or accessories.

On the other hand, some customers who only made around 10-12 purchases contributed significantly more to company revenue. This suggests that frequency is not always a key factor when evaluating customer value—customers who purchase frequently may not necessarily bring high revenue.

Customer Distribution based on their Order Frequency  
filtered by Loyal categories

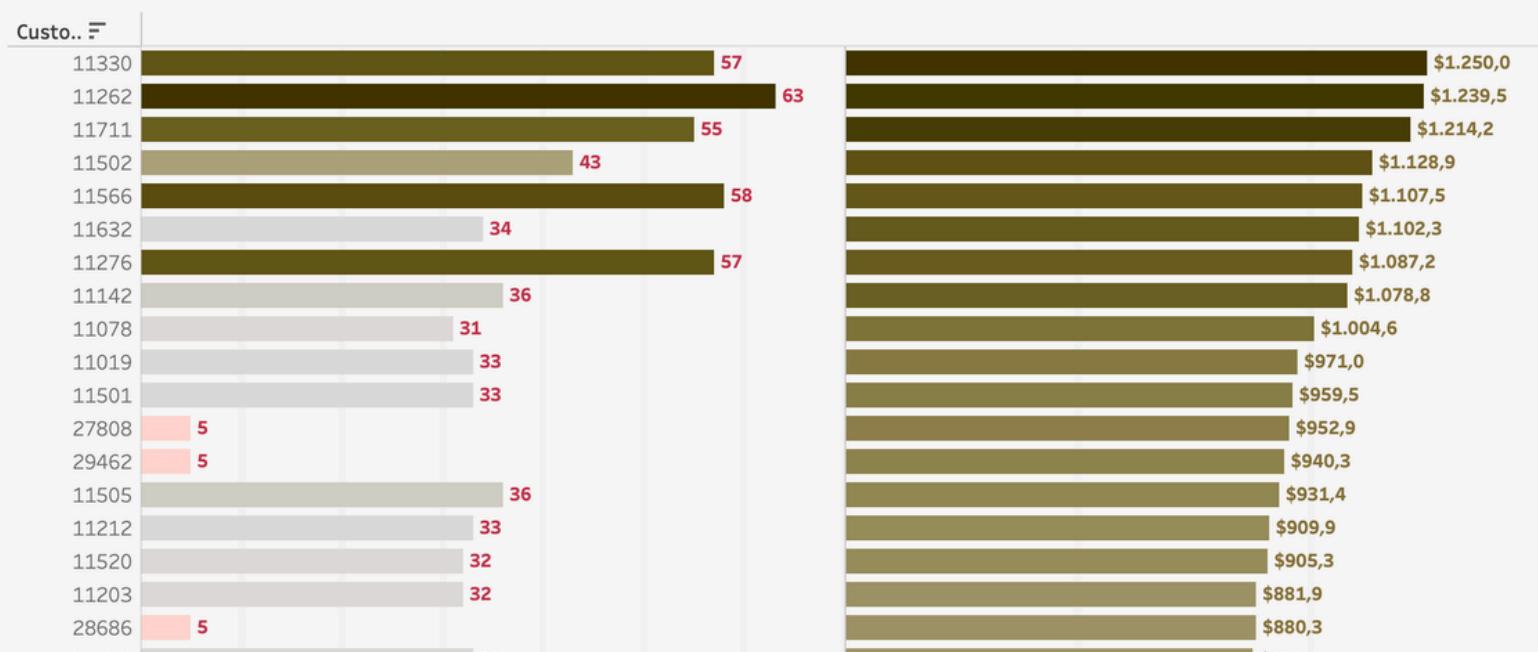


Figure 5: Customer Distribution based on their Order Frequency filter by Loyal categories

# Hidden potential in long-term stability.

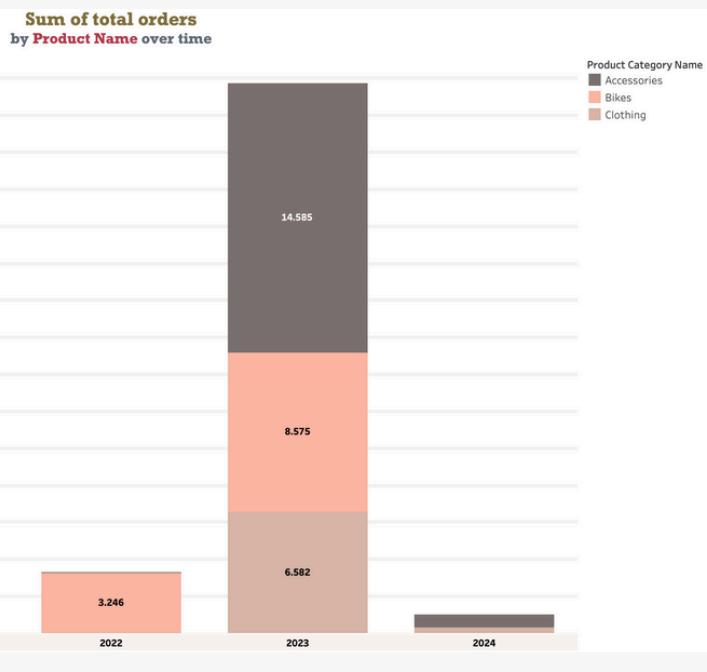
HOWEVER, IT'S IMPORTANT TO NOTE THAT LOYAL CUSTOMERS SEEM TO PLAY A CRUCIAL ROLE IN TRB'S LONG-TERM REVENUE.

**RECOMMENDATION: THE COMPANY SHOULD CONSIDER IMPROVING PRODUCT QUALITY AND ENCOURAGING THESE LOYAL CUSTOMERS TO SHIFT TOWARD PURCHASING HIGHER-VALUE ITEMS (E.G., BICYCLES).**

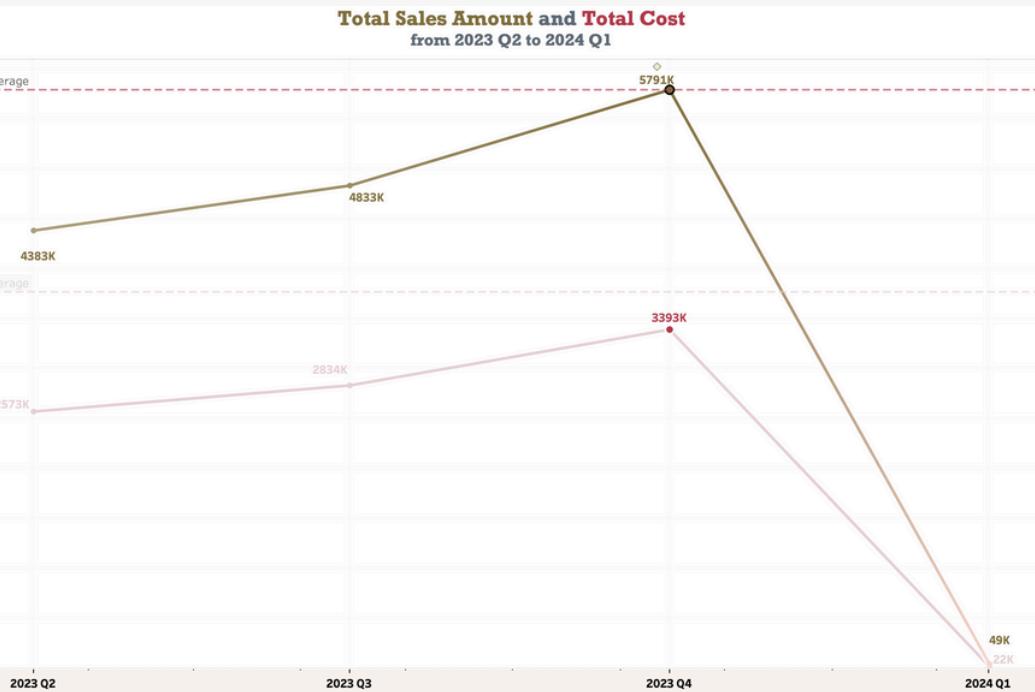
For instance, between late 2024 and early Q1 2024, there were **no transactions involving high-value items like mountain bikes or road bikes** (**figure 5**), which led to a sharp drop in sales—from \$5.7 million down to around \$50,000 by the end of the analysis period (shown in the line chart). This also corresponds with **the apparent disappearance of the Big Spender segment during Q1 2024** (**figure 7**), likely because most large transactions came from bicycle purchases. During this time, most of TRB's revenue came from the **Loyal segment**, which **accounted for 32.55%** of customers and contributed \$162,296—**over 53% of the total sales amount**. In contrast, the **Most Valuable segment made up only 1.98%** of customers and contributed 18.4% of total revenue.

From late 2022 through 2023 was considered a boom period for the company. Especially from Q4 2022 to a peak in Q4 2023 (**figure 6**), the number of customers in the "must-have priority" segment increased steadily. Meanwhile, **the most at-risk segment—churned customers—accounted for the lowest proportion**. This contributed significantly to the increase in total revenue, driven by various customer segments rather than relying solely on Big Spenders.

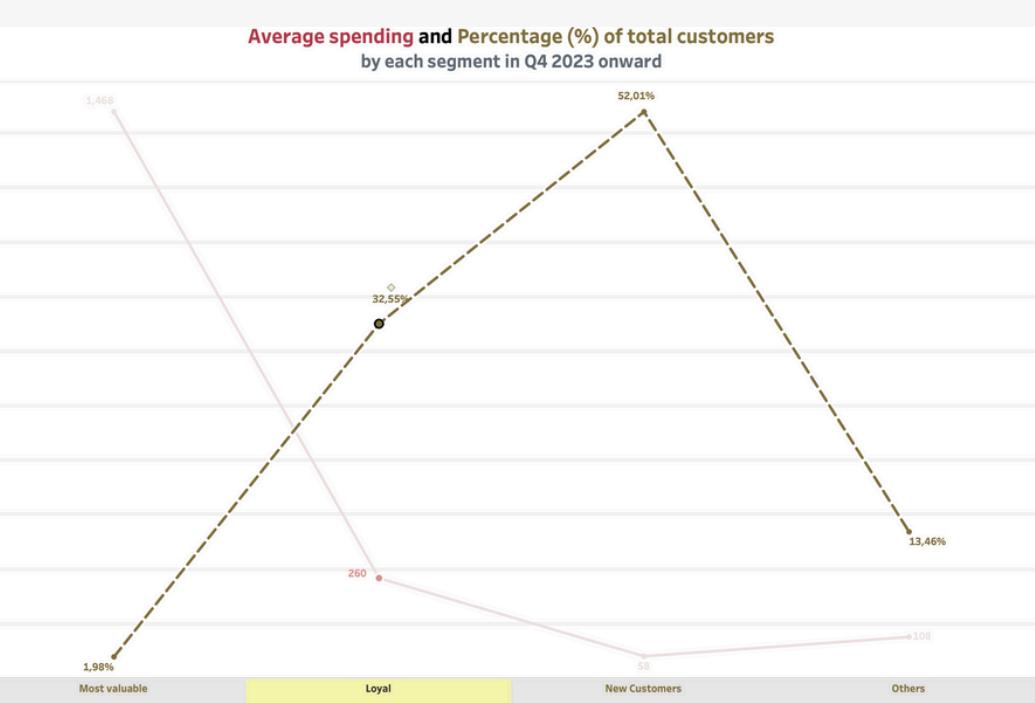
**This trend suggests that the company may have been on the right track during that time, particularly in terms of improving product quality.**



**Figure 5: Stacked chart sum of total order**



**Figure 6: Trend of Sales Amount**



**Figure 7: Count of customer segment**

# Product Statistics Breakdown

*An alias in the chart with zeros sales recorded is Component, yet they comprise of 33% of the total standard cost (\$62.226), supposedly due to overstock or unused inventory.*



Figure 8

- With the highest recorded **profit margin of 93.5%**, Accessories are the best selling items. Although having a high margin, they generate only \$770.760 in profit, which is relatively small combined with having a **very low standard cost of \$68.964**. (figure 8)
- An alias in the chart with zeros sales recorded is Component, yet they comprise of 33% of the **total standard cost (\$62.226)**, supposedly due to overstock or unused inventory.
- On the other hand, the **most profitable product is Bikes with \$31.149.959** in revenue, they are the core money source for the company. (figure 9)

# Top-selling product categories.

*The overall sales compared with the total count of order.*

## Profitable products (\$) or best-selling products (unit) ?

Total Sale for All segment by All categories

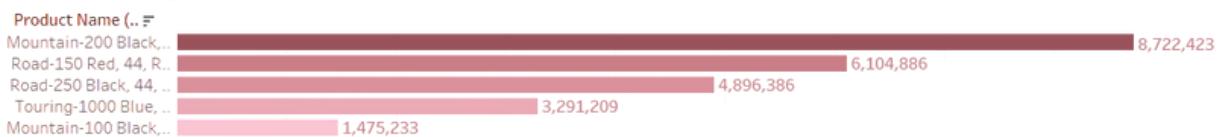


Figure 9

## Sales

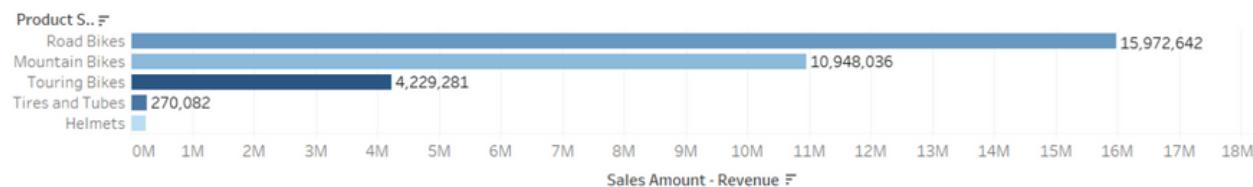


Figure 10

## Bikes

The top-performing models are Mountain-200, Road-150, and Road-250, in which having a light frame in common. With such high profit, Bikes should remain the strategic focus for sales and marketing campaigns, which can be bundled with Accessories for sales boosting.

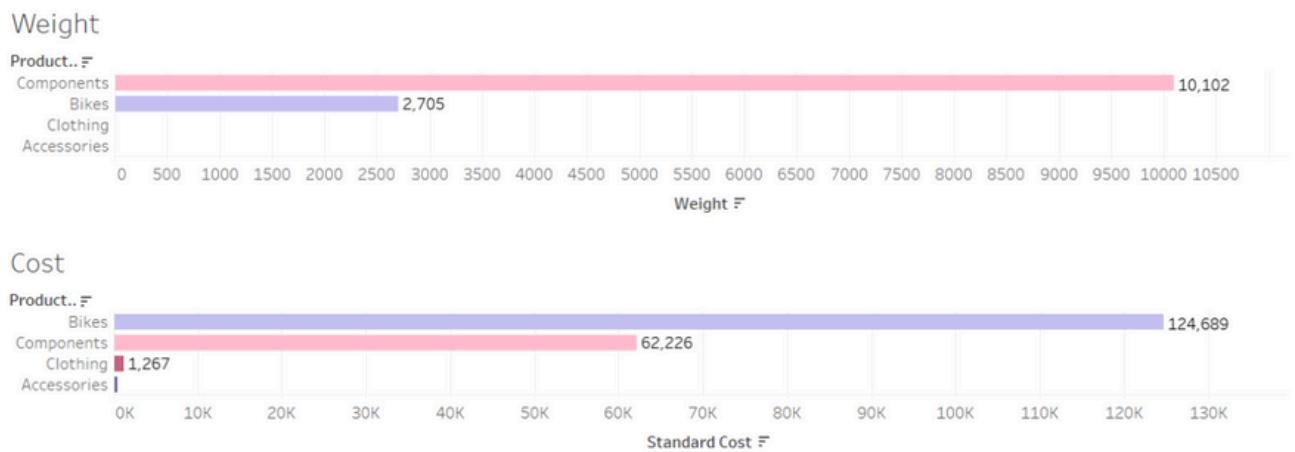
While the best-performing product is the Mountain-200 model, the overall sales of Road Bikes sold more than 5 millions bikes compared to Mountain model, due to most of the Road Bikes models ranked in the top 10 best selling Bikes.

## Description of the top three selling model

Among the top-selling bikes (figure 9), Road-150, Road-250, and Mountain-2000 - all three bikes feature lightweight aluminum frames. With the strong sales of three models across different price points: Mountain-100 (\$ 1,310.29 Affordable), Road-150 (\$ 3,936.10 Mid-end), Road-250 (\$ 2,399.72 - High-end) suggesting a broad demand for high-performance aluminum frames varying many socio economic segments.

# Component cost more than its worth

An alias in the chart with zeros sales recorded is Component, yet they comprise of 33% of the total standard cost (\$62,226), supposedly due to overstock or unused inventory.



**Figure 11**

Components are the heaviest items with a total of 10.102kg compared to Bikes with only 2.705kg. But previous data showed that there are zero sales recorded for the past years, which indicates that the products have poor ROI due to high storage cost and low sales. Not only that, having excess inventory can increase warehousing costs as they are tying up capital and space. One of the reasons can be that heavy products can likely incur a higher shipping cost - which can cause hesitation in buying Components.

***While the company has promotions running for Components, it has not been successful due to no sale being incurred. One recommendation is to offer free bike maintenance which may help stimulate demand for Components.***

# Conclusion/ recommendation

*Based on data-driven analysis, here are our recommendations:*

## **Focus on High-Performing Products**

Bikes take the lead as the top-selling product segment. We could expand inventory for top-selling models, hence create more models based on quality and color preference.

## **Seasonal Sales Strategy**

June is shown to be the peak month of orders where a huge amount of orders was recorded throughout the analyzing period. Taking that information, we could align marketing campaigns and stock levels with seasonal demand. May run promotional campaigns to enhance customer purchase desiration.

## **Regional Optimization**

As Canada and New Zealand stores being local favorites where the sales driven was largest, proposing prioritizing inventory and advertising there. For underperforming states as the United State is considering restructuring or have a different marketing approach / branding to better suit local preferences.

## **Customer Loyalty Programs**

To increase repeat customers - we could implement reward systems or offer bundle deals/ service packages. For the Big Spender segments - we could provide more discounts on returns, continually catch up with resellers and provide them with deals or maintenance services.

## **After-Sales Service invEnhancement**

Components was the most concerning product group where no sales were recorded - suggesting repositioning the product as a byproduct of Repairing/Maintenance service instead of a standalone product.

# APPENDIX

## Data and Workflow

- Data was collected from a TRB file attached on iLearn. This file contains sales information of TRB from 2020 quarter 1 to 2024 quarter 1.
- Raw data includes 4 main files stored in Excel, naming Orders, Products, Customers and Promotions.
- We load raw data into Python, then extracted and analyzed with Python and Tableau as well. Finally, we found that some metrics can support our insights.
- Data and informative insights will be generated and visualized through Tableau 100%
- Using mainly in Jupyter Notebook..

## Data Analysis and Dashboard

### 1. Python analysis (basic)

- Data analysis with Python script (Jupyter Notebook).
- The whole exploratory analysis is mainly focused on the Orders table which is referenced to others like Products tables or Customers tables.
- The ultimate goals in Python are to formula trend, take a quick look at descriptive statistics of the whole variables and segment the RFM's analysis models to group customers into different groups with distinct characteristics and purchasing behaviors.

### 2. Tableau analysis and visualization

- We ultimately made use of Tableau doing the rest of the analysis, which told us the difference between when orders were made by who customers and of which products.
- The Tableau function also allows us to compare the overall performance of TRB selling and brand health of different attributes over time (including new parameters called "Profit Margin" that we create to highlight the hidden context of a corporation's financial health).
- Details in information, analyzing codes, comments will be found in the attached Jupyter notebook below: [...]

### 3. Dashboard

- After finishing the interactive dashboard, we believe that it is a user-friendly dashboard allowing the manager to filter and integrate all the data information so that this enables them to generate insight within a chart at the same time.
- 2 dashboards: one for manager - overall dashboard and one for marketing department.

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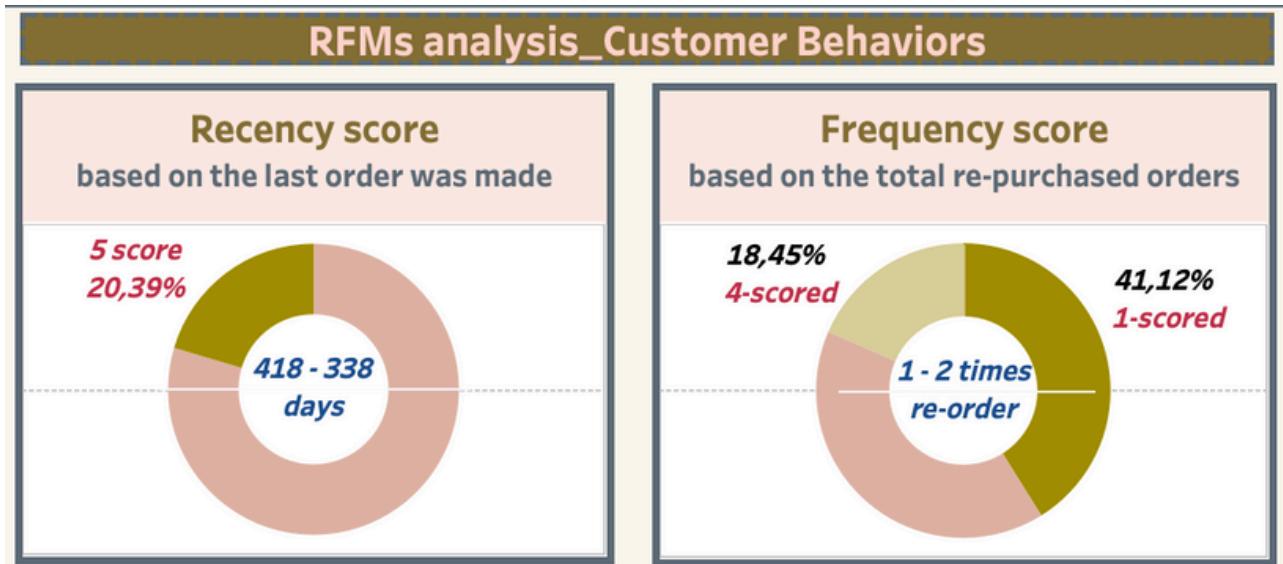
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# RFM analysis metrics

What is RFM analysis ?



- Segmentation of customers behaviors into different segments based on their 3 main Recency, Frequency and Monetary score.
- Scores ranging from 1 (lowest value) to 5 (highest value) for each factor, understanding how recently customers made orders, how frequently they purchase those products, how much they're willing to pay for those products.
- Based on that, our brands are able to design a framework for each segment and define which are the main problems experienced by specific customers.

# STEPS BY STEPS TO FORMULAR RFM METRICS FOR OUR REPORT

## Recency:

- The last order day each customer was made since the current date (setting up default 30/12/2024). Customers who made these orders recently are predicted to re-purchased over and over again if TRB's product performance remains the same or improves.

Recency (last order date) = Today.time - maxvolumn(OrderDate) / per customer

Score	Recency Range (Days)	% Customer	Interpretation
5	318–410 days	20.39%	Most recent purchasers
4	411–470 days	19.65%	Recently active
3	471–543 days	19.96%	Moderately recent
2	544–625 days	20.08%	Becoming inactive
1	626–1464 days	19.91%	Long inactive (possibly churned)

>> The shortest duration (5-scored) for the customers orders is from 338 to 418 days (made up of 20.39%) and the longest orders (1-scored) were made from 1464 days (made up of 19.91%).

>> TRB's Customers who have purchased most recently are given the highest scores but not too much.

>> Customers who haven't purchased in 626+ days may be churned or very inactive.

# STEPS BY STEPS TO FORMULAR RFM METRICS FOR OUR REPORT

## Frequency:

- Total number of orders was made by each customer (how often they return to buy products). Potential key framework for “Loyalty” segmentation which have greater attachment and commission with brand.

Frequency(total number of re-purchased order) = Count(OrderID)/ group by(CustomerKey)

Score	Min order	Max order	Percentage
#4	5	68	18%
#3	4	4	15%
#2	3	3	25%
#1	1	2	41%

>> Majority of Customers Have Low Frequency

>> 41% of customers fall into Score #1 ( repeat 1-2 orders), nearly a half

>> 25% fall into Score #2 (frequency = 3).

>> That's nearly 66% of customers purchasing fewer than 4 times — indicating a majority are low-engagement or one-time buyers.

>> This seems to make sense to the overall business context, because TRBs provide durable goods like bikes or sports equipment which is rarely re-purchased over and over again.

>> The steep drop from Score #1 to #4 suggests there's a big opportunity to nurture occasional buyers (Score #1 and #2) into more frequent shoppers.

You could target Score #2 and #3 segments with loyalty programs, follow-ups, or personalized offers to encourage more purchases.

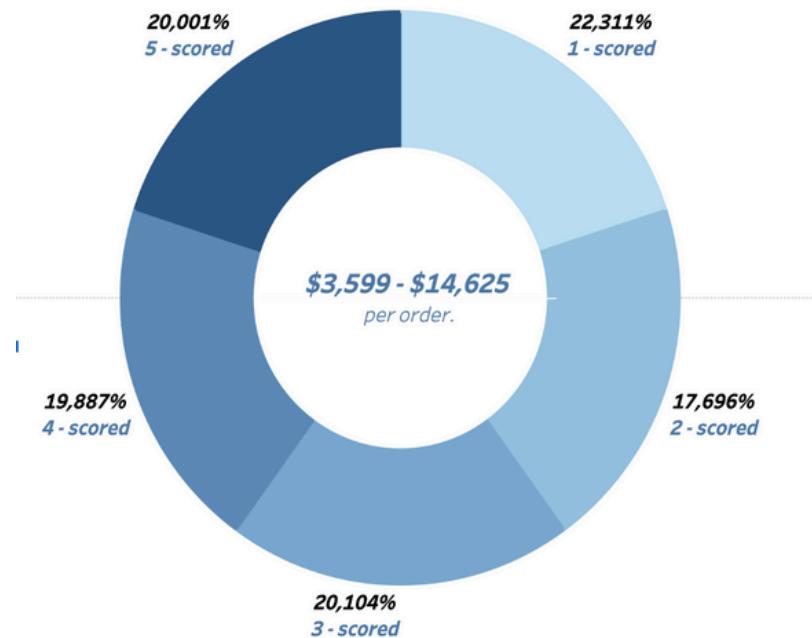
>> Those customer which return more than 5 orders are reasonably considered as loyal customers segment

# STEPS BY STEPS TO FORMULAR RFM METRICS FOR OUR REPORT

## Monetary:

Customer values and profitability based on total spending they acquire.

Monetary = Sum(Sale Amount) / group by (CustomerKey)



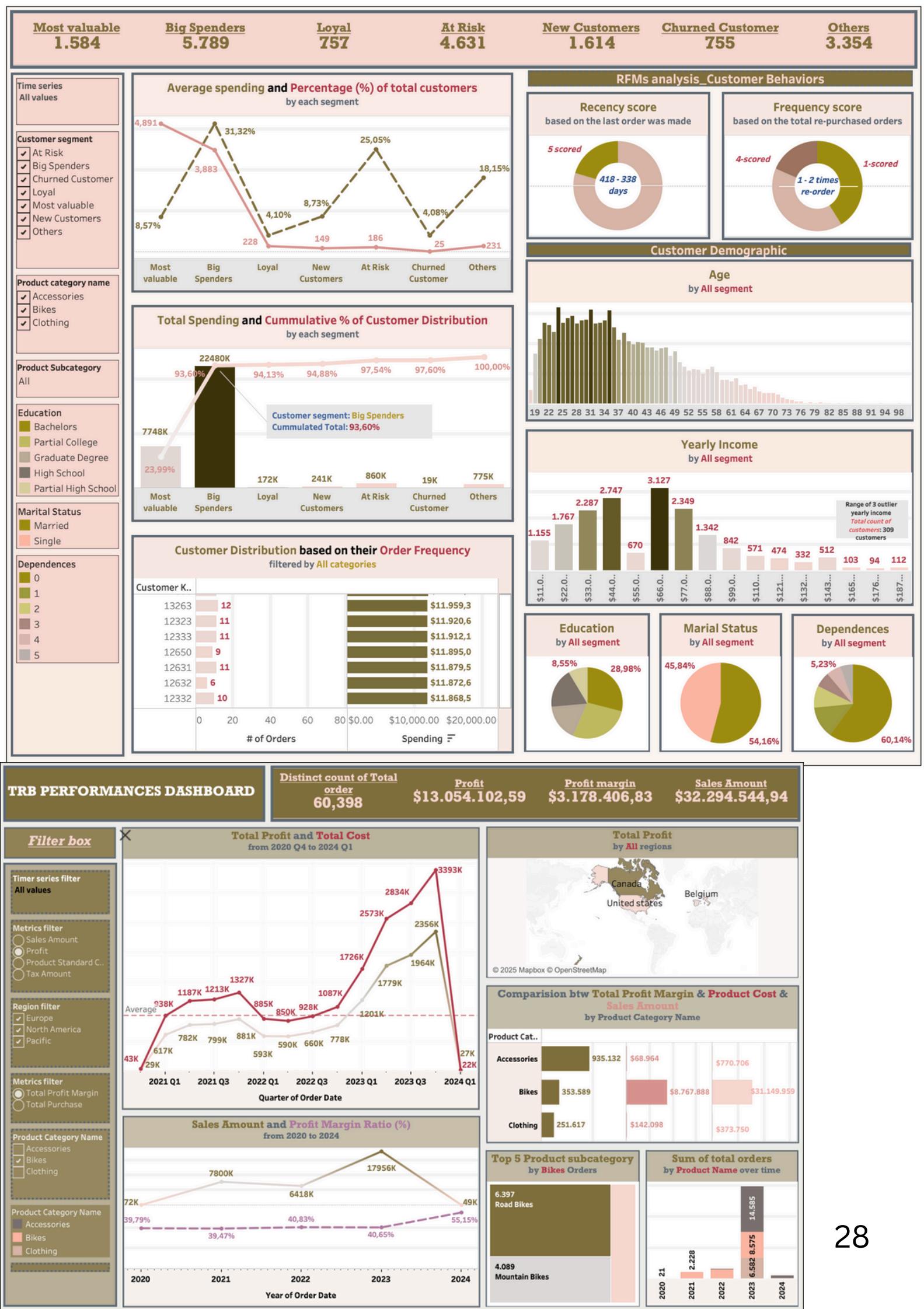
*Figure 7.3. Monetary Percentage*

- > The most valuable orders took around \$3,600 to \$14,625, accounting for above 20% of total orders

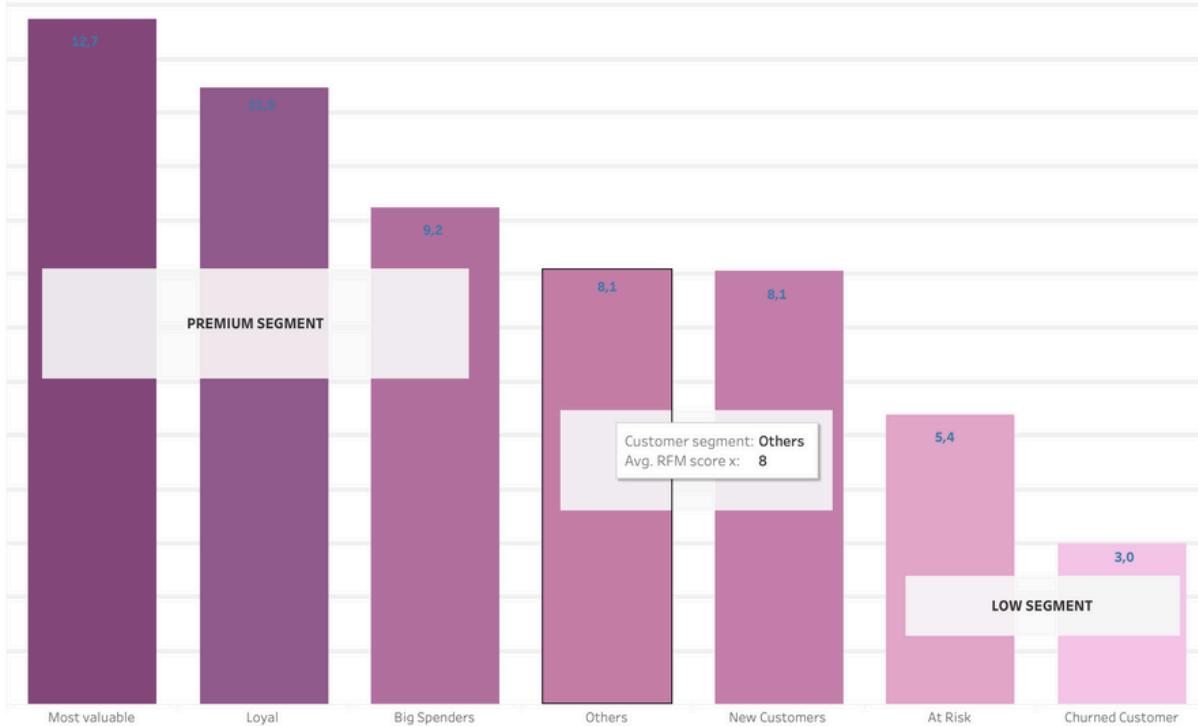
## Python scripts

```
today_time = pd.to_datetime('2024-12-30')
RFM_df = Order.groupby('CustomerKey').agg({
    'ProductKey': 'count', #Total purchase
    'OrderDate': lambda o: (today_time - o.max()).days,
    'SalesAmount': 'sum'})
```

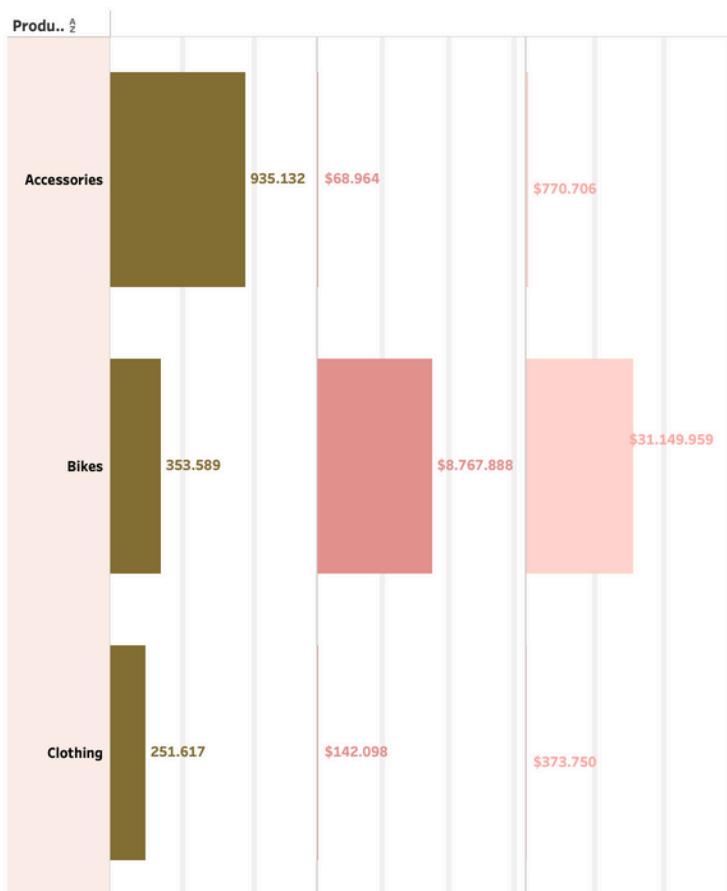
*In conclusion, Because TRB is a consumer durable industry (high-value product), HIGH TRANSACTION VALUE AND Low frequency*



Average RFM Scores for each customer segment.



**Comparision btw Total Profit Margin & Product Cost & Sales Amount  
by Product Category Name**



- I acknowledge that I have not used GAITs (e.g., ChatGPT) in drafting and proofreading this assignment.
- \*\*\* I acknowledge that I have only used GAITs (e.g., ChatGPT) in drafting and proofreading this assignment, which is permitted in the assignment instructions.

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- II. I CONSENT TO THE UNIVERSITY PROVIDING MY TITLE, NAME AND EMAIL ADDRESS AND THE WORK I SUBMIT TO TURNITIN SO THAT MY WORK MAY BE ASSESSED FOR ORIGINALITY AND IN PURSUIT OF PLAGIARISM PREVENTION GENERALLY;**
- III. I AM AWARE THAT TURNITIN MAY PROVIDE MY PERSONAL INFORMATION TO ITS SUBCONTRACTORS FOR THE PURPOSE OUTLINED ABOVE;**
- IV. I AM AWARE TURNITIN STORES MY PERSONAL INFORMATION IN THE UNITED STATES OF AMERICA OR ELSEWHERE OUTSIDE NEW SOUTH WALES, AND THOSE JURISDICTIONS MAY HAVE PRIVACY LAWS WHICH ARE DIFFERENT TO THOSE IN NEW SOUTH WALES;**
- V. I HAVE READ THE TURNITIN END USER AGREEMENT, THE TURNITIN USAGE POLICY AND THE TURNITIN PRIVACY POLICY;**
- VI. IF MY WORK CONTAINS PERSONAL, CONFIDENTIAL OR SENSITIVE INFORMATION OF ANOTHER PERSON/ENTITY, I HAVE OBTAINED THAT PERSON'S/ENTITY'S CONSENT TO SUBMIT MY WORK TO TURNITIN.**