

NORTHWIND

Project# 1



Presentation

24Slides

Introduction:

Group-A

- ▶ Syed Rehan Ali
- ▶ Muhammad Ahmed
- ▶ Rana Sheraz Shafi
- ▶ Muhammad Umair Arif

About: NorthWind Sample Dataset

- ▶ Wholesale Distribution Company (B2B) working since 04-07-1996.
- ▶ Providing to 93 Businesses over 21 countries with wide array of products under 8 different categories. From Beverages to Seafood.

EDA: Exploratory Data Analysis

- ▶ Categories --→8
- ▶ Customers --→93
- ▶ Employees --→9
- ▶ Orderdetails --→2155?
- ▶ Orders --→830
- ▶ Products --→77 Discontinued --→8
- ▶ Regions --→4
- ▶ Shippers --→3
- ▶ Suppliers --→29
- ▶ Territories --→53

Business Metrics Analyzed In This PROJECT:

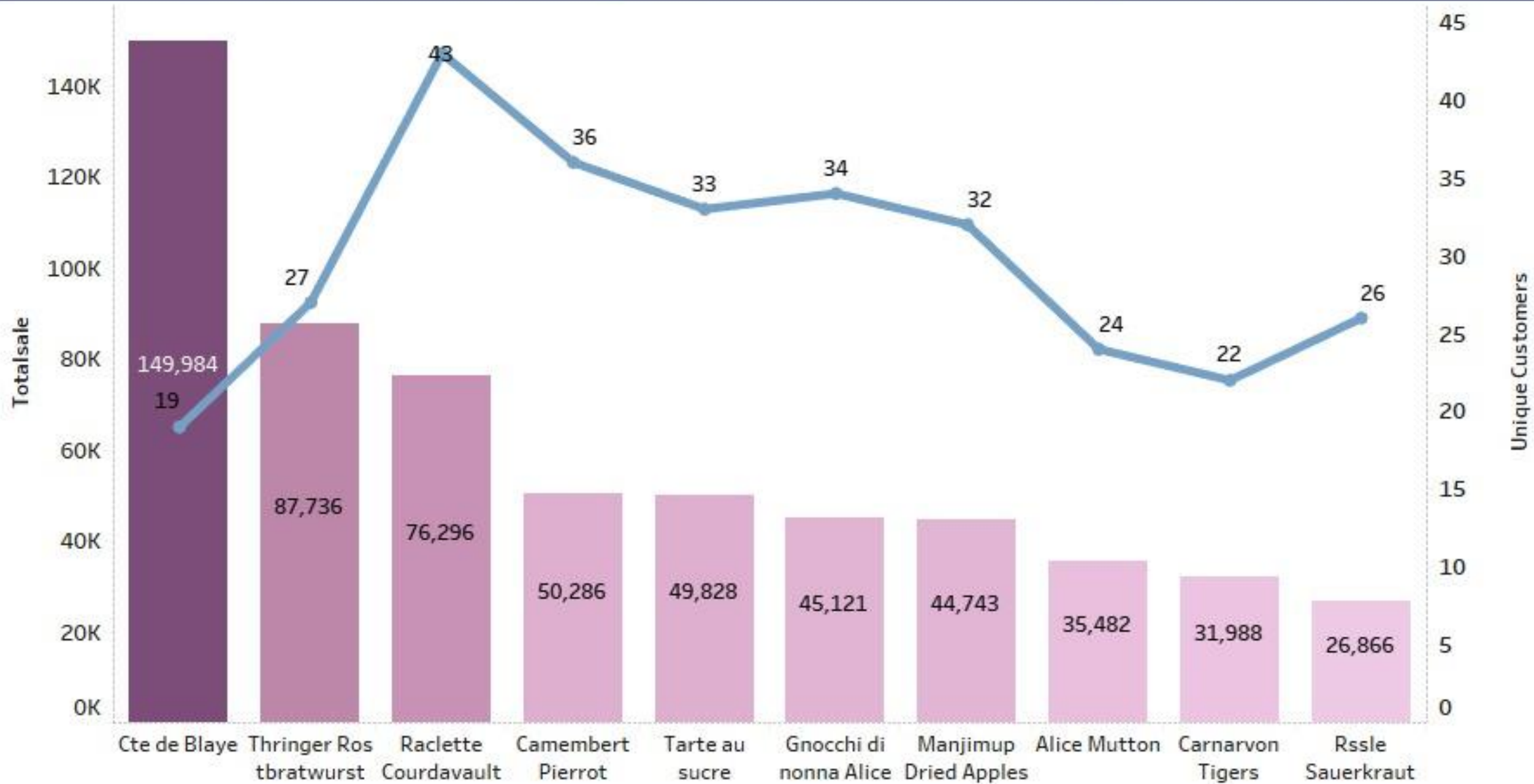
- ▶ Product Performance Ranking
- ▶ Customer Segmentation based on RFM Analysis
- ▶ Churn and Retention Rate Calculation
- ▶ Critical Inventory Status
- ▶ Employee's Performance
- ▶ Shipper's Performance

Product Performance Ranking:

- ▶ **BUSINESS METRIC: Top Selling Products (That brings the max revenue)**
 - ▶ **Importance:**
 - ▶ Revenue Generation.
 - ▶ Strategic Decision Making.
 - ▶ Inventory Management.
 - ▶ Marketing and Promotions.
- ▶ **WHY UNIQUE CUSTOMERS:** We aim to identify unique customers for high-sales products to strategically retain and engage them through effective marketing and decision-making.



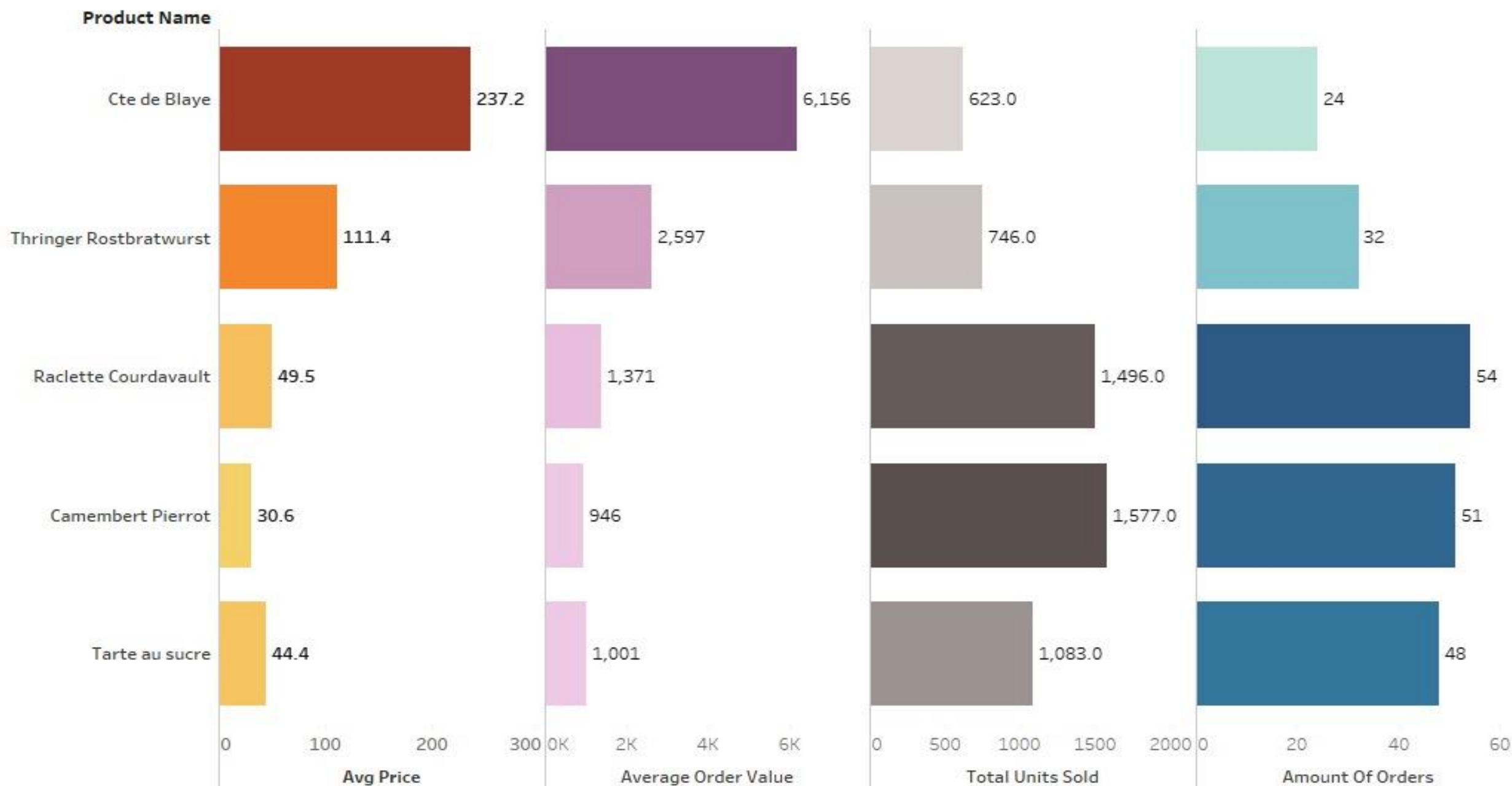
Top 10 Sales Generating Products with Their Unique Customers



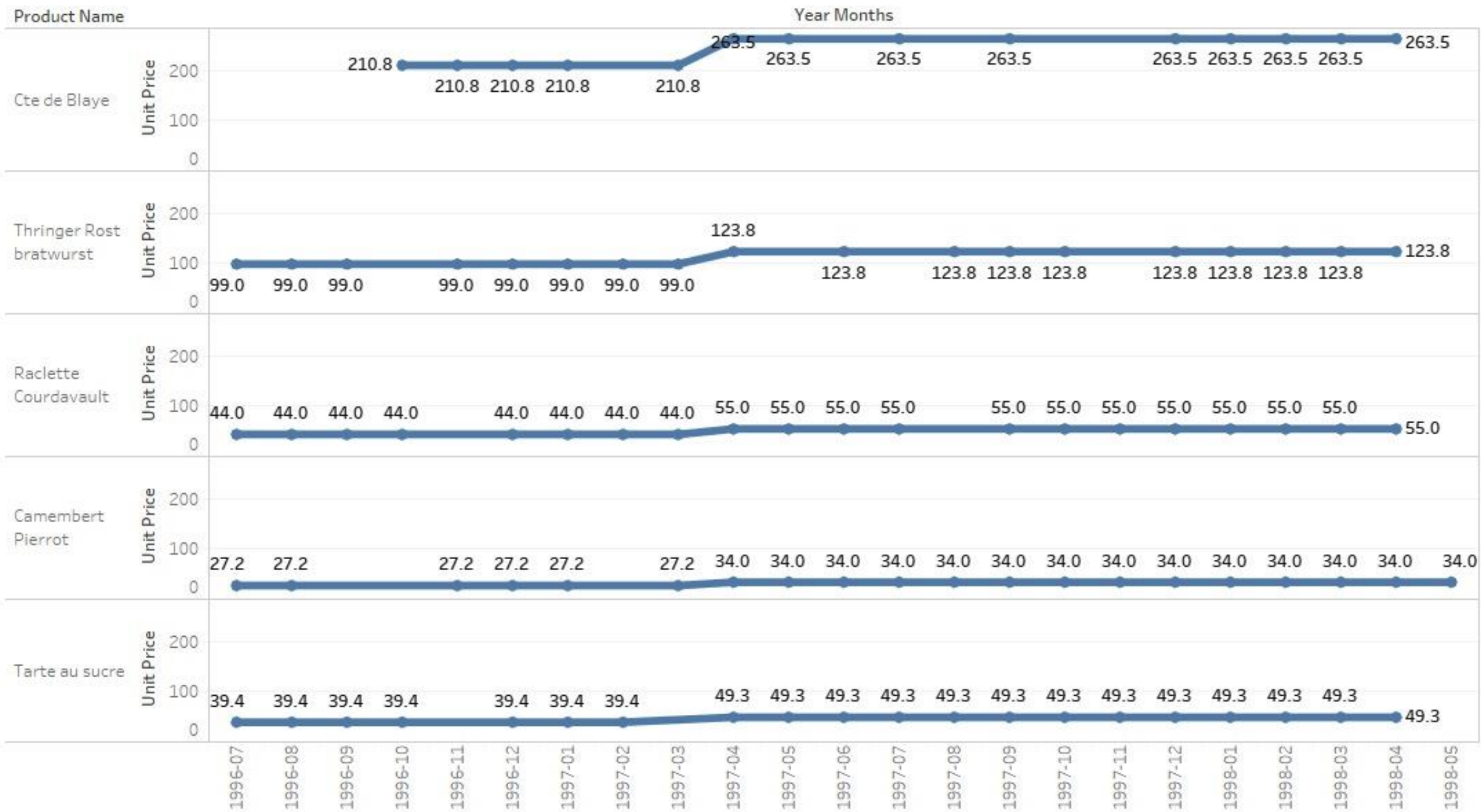
Top 5 Products Sales Comparison Metrics:

- ▶ Price
- ▶ Average order value
- ▶ Total Units sold
- ▶ Amount of orders

Top 5 Products' Sales Comparison Metrics



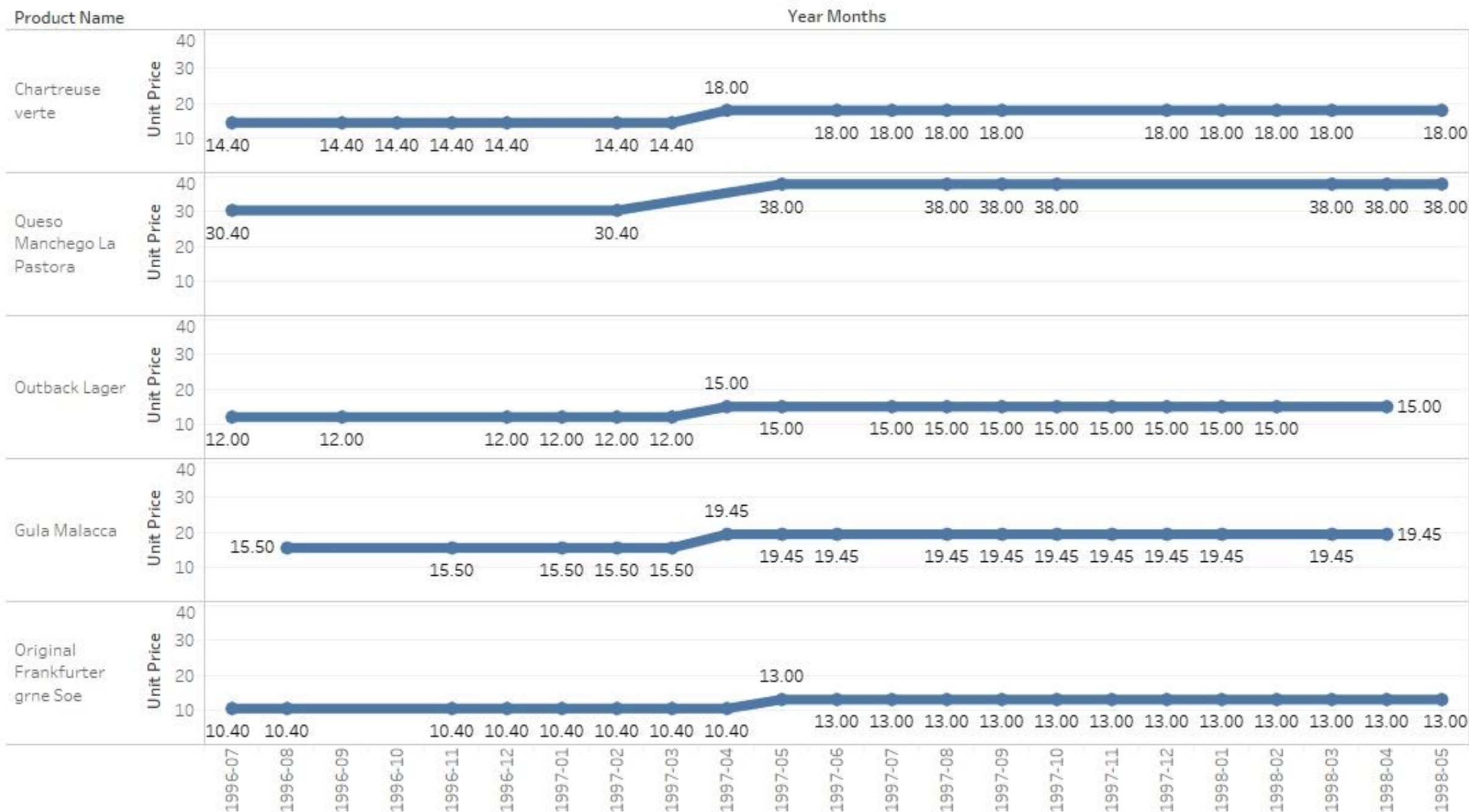
Top 5 Products: Price Time Series Analysis



Top 5 Products: Price / Percent Increase Analysis



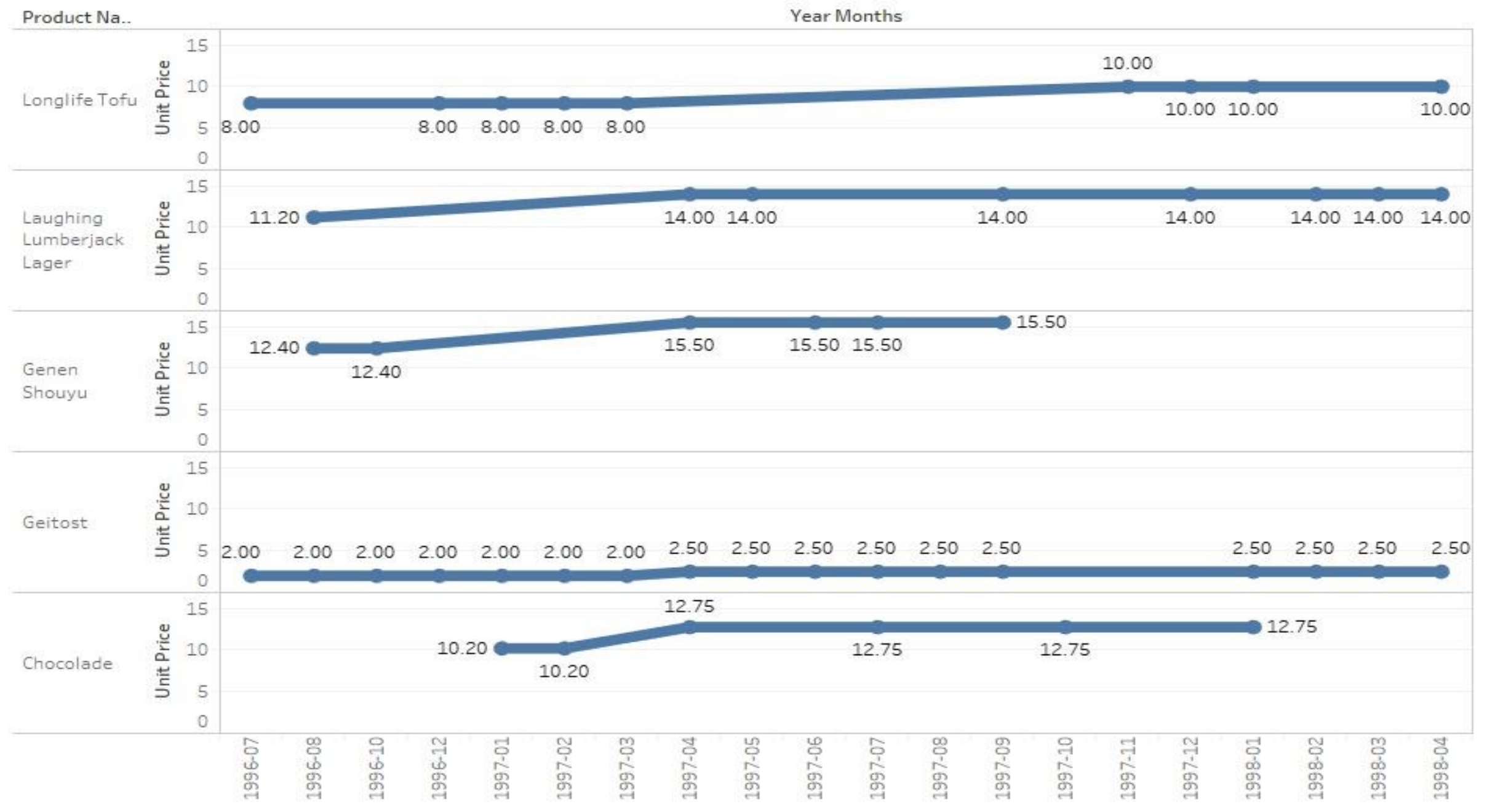
Mid 5 Product: Price Time Series Analysis



Mid 5 Products: Price / Percent Increase Analysis



Bottom 5 Product: Price Time Seires



Bottom 5 Products: Price / Percent Increase Analysis



Proposed Solutions and Expected Outcomes

- ▶ Since highest sales generating products have less unique customers as compared to others.
- ▶ So, we have to

RFM Customer Segmentation:

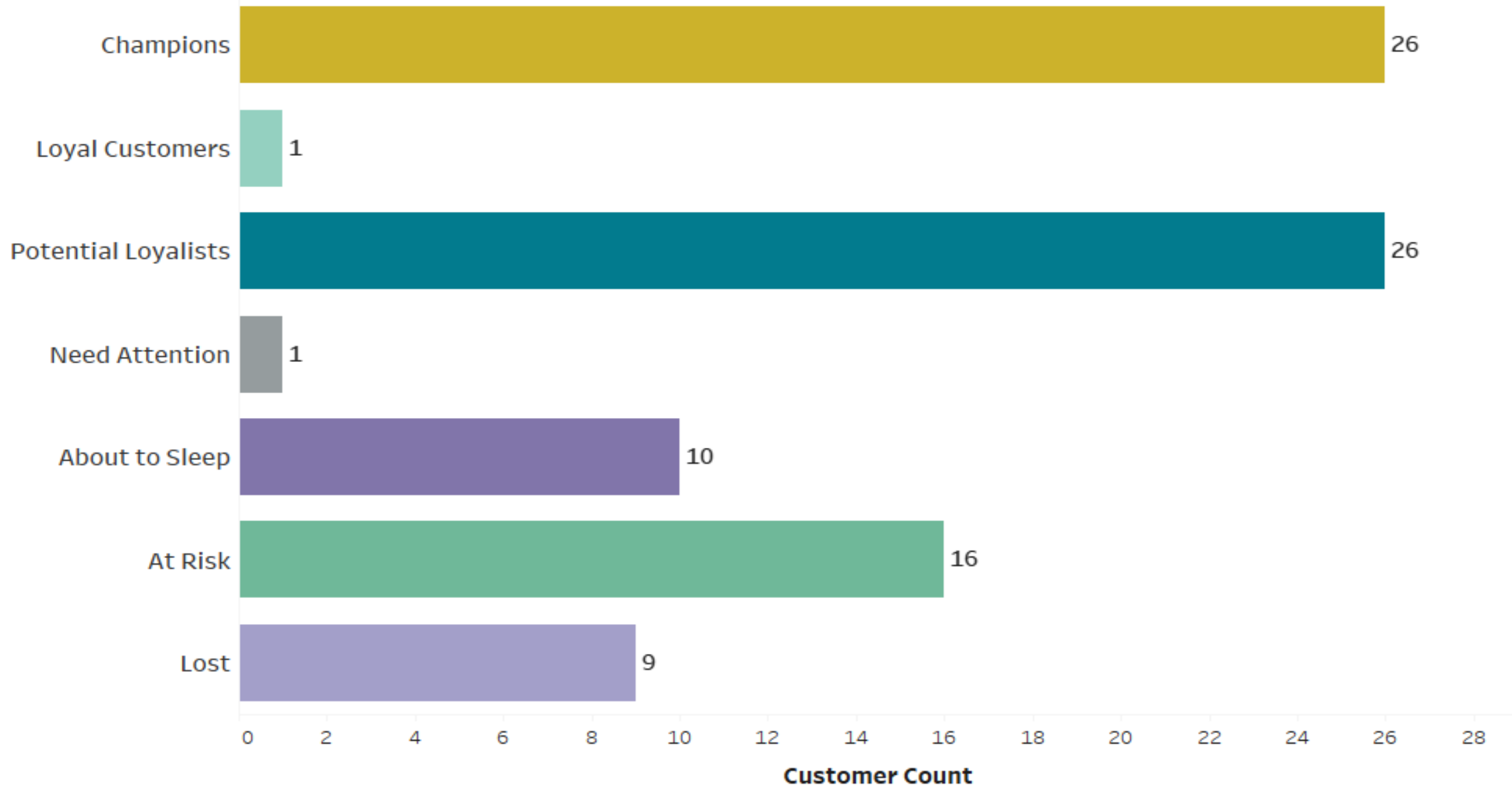
- ▶ Definition: RFM customer segmentation is a method of categorizing customers based on three key factors:
 - ▶ **Recency** (how recently a customer made a purchase)
 - ▶ **Frequency** (how often a customer makes purchases)
 - ▶ **Monetary** (Average Order Value).



S.no	Customer Segments	Segment Descriptions	R	F	M
1.	Champions	High-Value, Active Customers	3-5	4-5	4-5
2.	Loyal Customers	Consistent, Valuable Buyers	2-3	3-4	4-5
3.	Potential Loyalists	Promising, Engagement Opportunity	2-3	2-3	3
4.	Need Attention	Declining, Active Customers	2	2	3
5.	About to Sleep	Inactive, Possible Revival	1	1-2	1-4
6.	At Risk	Churning, Engagement Needed	1	1-2	1-3
7.	Lost Customers	Inactive, Hard to Reclaim	1	1	1

RFM Analysis

Customer Segments



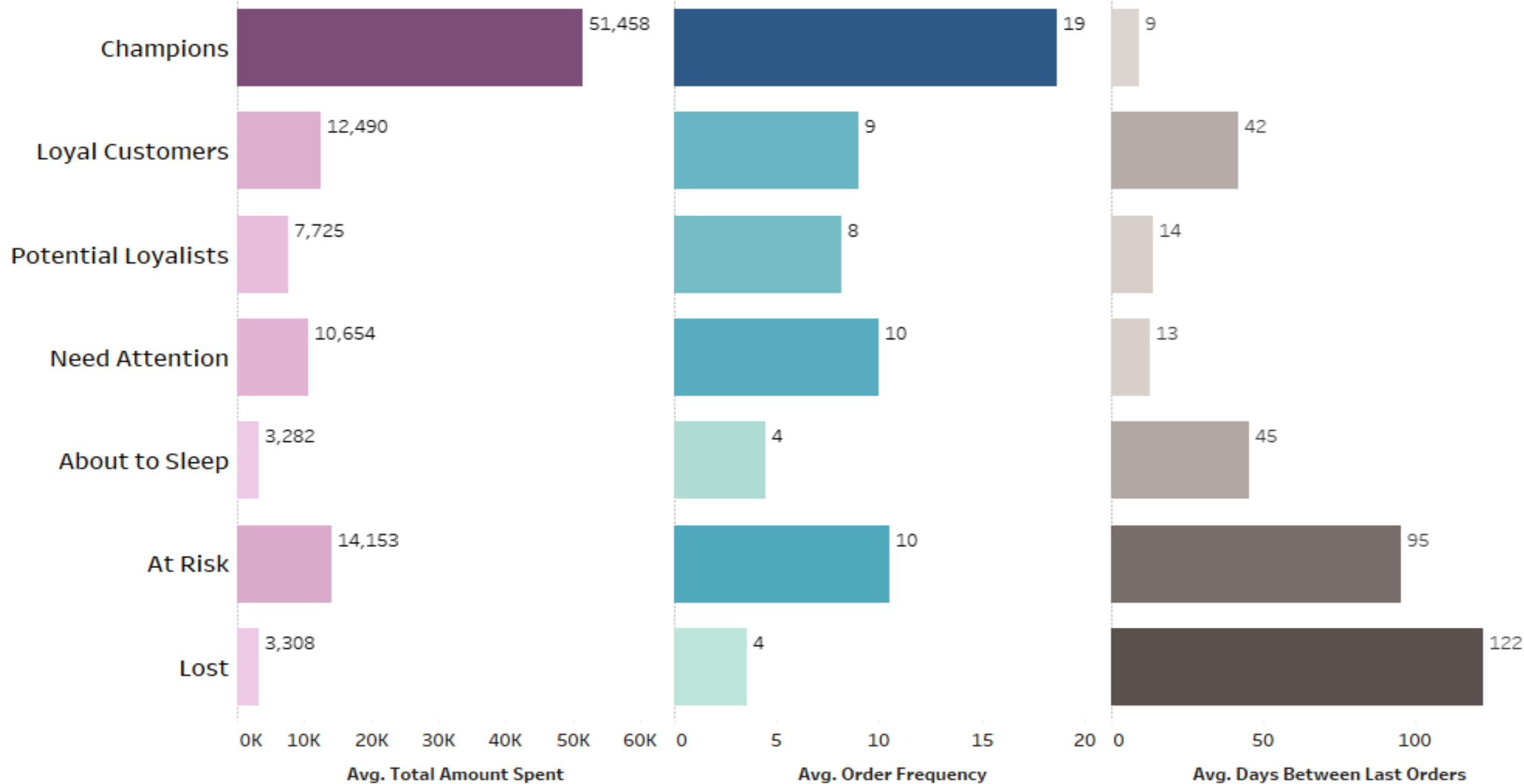
RFM Average by Segments:

RFM averages by segments refer to the calculated average values of Recency, Frequency, and Monetary metrics within each customer segment created through RFM segmentation.

It provides insights into the typical behavior of customers in each segment.

RFM Average by Segments

Customer Segments



Proposed Solutions and Expected Outcomes

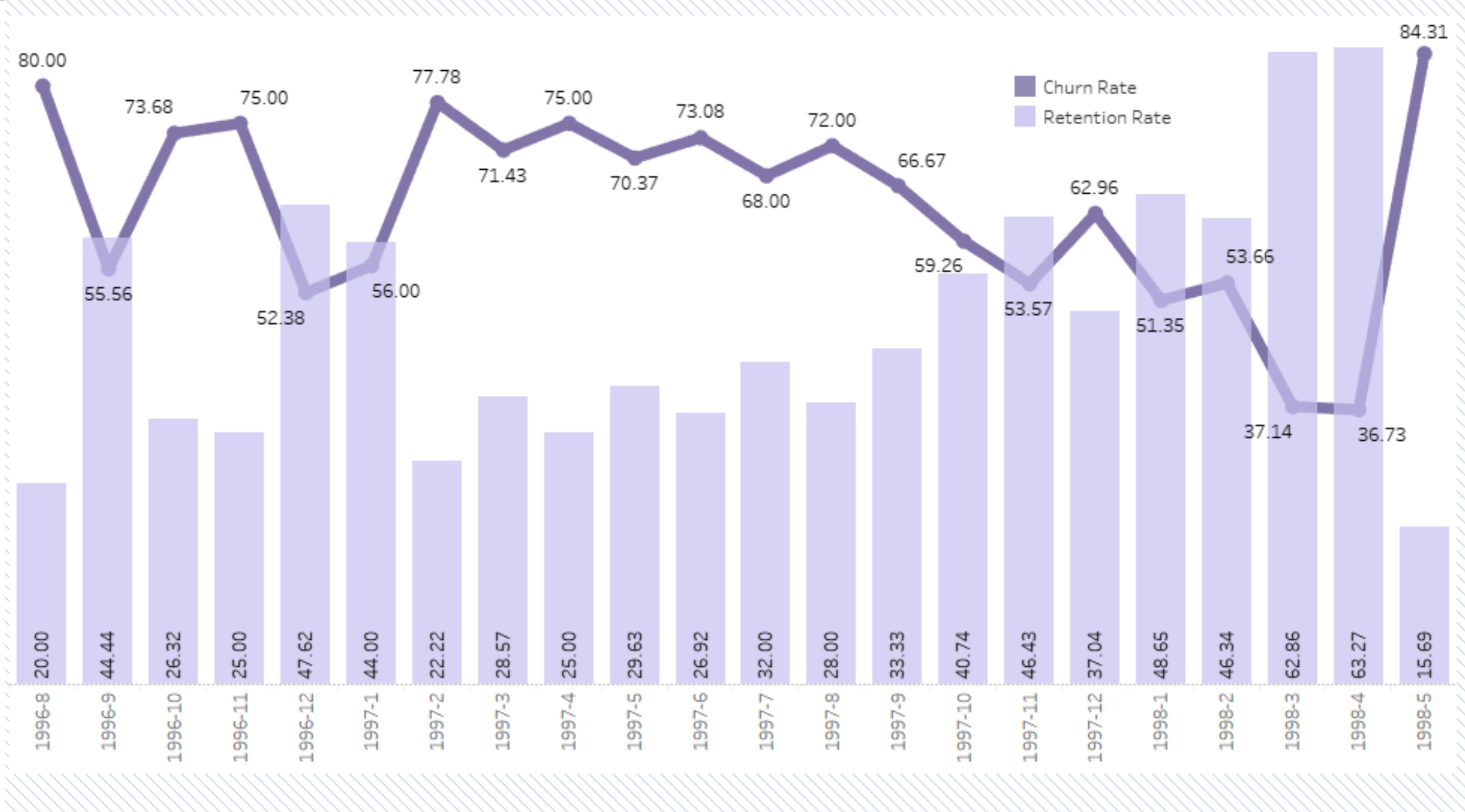
- ▶ This segmentation helps in identifying and targeting customers with similar buying behaviors.
- ▶ Improving these metrics can boost revenue, as satisfied customers tend to spend more and remain loyal.

Churn, Retention Analysis:

Churn rate is the percentage of customers who have stopped using a product or service over a given period. while retention rate is the percentage of customers who continue to use it. Churn and retention analysis evaluates customer loyalty and attrition.


$$\text{CHURN RATE} = \frac{\text{CUSTOMERS LOST}}{\text{TOTAL CUSTOMERS}}$$

The diagram illustrates the formula for calculating the churn rate. It consists of three magenta circles arranged horizontally. The first circle on the left contains the text 'CHURN RATE'. To its right is an equals sign (=). The second circle in the middle contains the text 'CUSTOMERS LOST'. To its right is a division symbol (÷). The third circle on the right contains the text 'TOTAL CUSTOMERS'.



Proposed Solutions and Expected Outcomes

- ▶ Provide excellent customer service and address issues promptly.
- ▶ Lower churn reduces the need for acquiring new customers and, consequently, decreases CAC, leading to cost savings and improved profitability.

Critical Inventory Status:

Critical inventory status involves monitoring and managing inventory levels of products.

This includes tracking the number of :

- ▶ Units in stock.
- ▶ Average units sold.
- ▶ Reorder levels.

to ensure product availability and prevent stockouts.



Categorization Basis:

- ▶ Units In Stocks < Monthly Average Sales = **CRITICAL**
- ▶ Products with Reorder Level = 0 : Must be **assigned with Reorder Levels** based on their monthly average sales
- ▶ Products that have inventory Over Stocked must be **optimized**
- ▶ Products that have balanced inventory as compared to their average sales **No need to optimize**
- ▶ Products that have Units in stocks almost near to there Monthly Average have **Potential of being Out of Stock**

Inventory Status

Inventory Status

- Assign A Reorder Lev..
- CRITICAL - Assign A R..
- No Need To Optimize
- Optimization Requir..
- Potential StockOut

Assign A Reorder Lev..

■ CRITICAL - Assign A R...

☐ No Need To Optimize

■ Optimization Requir..

■ Potential StockOut

Aniseed Syrup	Gula Malacca	Ipoh Coffee	Konbu	Longlife Tofu	Louisiana Hot Spiced Okra
Chang					
	Manjimup Dried Apples	Outback Lager	Pavlova	Queso Cabrales	Rogede sild
Cte de Blaye	Mascarpone Fabioli				
Gnocchi di nonna Alice	Maxilaku	Scottish Longbreads	Teatime Chocolate Biscuits	Tourtire	
Gorgonzola Telino	Nord-Ost Matjeshering	Sir Rodney's Scones	Uncle Bob's Organic Dried Pears		
Gudbrandsdalsost	Original Frankfurter grne Soe	Steeleye Stout	Wimmers gute Semmelkndel		

Boston Crab Meat	Chai			Geitost	Genen Shouyu
					Gustaf's Knckebrd
	Filo Mix	Gravad lax	Jack's New England Clam Chowder	Inlagd Sill	Laughing
Lakkalikri		Rhnbru	Schoggi	NuNuCa	Rd Kaviar
Pt chinois				Sasquatch Ale	
Ravioli Angelo		Tunnbrd		Sirop d'orable	
		Vegie-spread			
Carnarvon Tigers	Queso Manchego		Tofu		
Chef Anton's	Raclette			Ikura	
Louisiana Fiery Hot	Sir Rodney's	Zaanse koeken			

Proposed Solutions and Expected Outcomes:

- ▶ We can Improve inventory management by employing demand forecasting and real-time tracking of our products.
- ▶ That will reduce costs, minimizes overstocking, and ensures product availability, leading to improved customer satisfaction and profitability.

Employee Performance:

- ▶ Employee performance metrics helps in ranking employees.
- ▶ It offers data-driven insights for informed decision-making and improvement.
- ▶ It fosters accountability, enhance engagement, and drive business success.

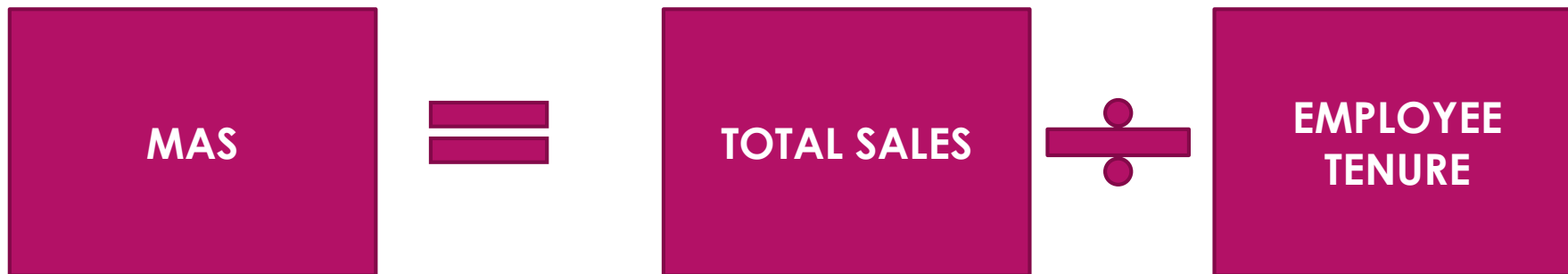


Ranking Measures:

- ▶ Monthly Average Sales
- ▶ Monthly Average Orders
- ▶ Number of Customers served.

Monthly Average Sales: MAS

- ▶ MAS = Total Sales / Number of Months



Monthly Average Order (MAO):

- ▶ MAO = Total Orders / Number of Months measures

The diagram illustrates the formula for Monthly Average Order (MAO). It consists of three magenta rectangular boxes arranged horizontally. The first box on the left contains the text "MAO". To its right is a magenta equals sign (=). The second box in the middle contains the text "TOTAL ORDERS". To its right is a magenta division sign (÷). The third box on the right contains the text "EMPLOYEE TENURE".

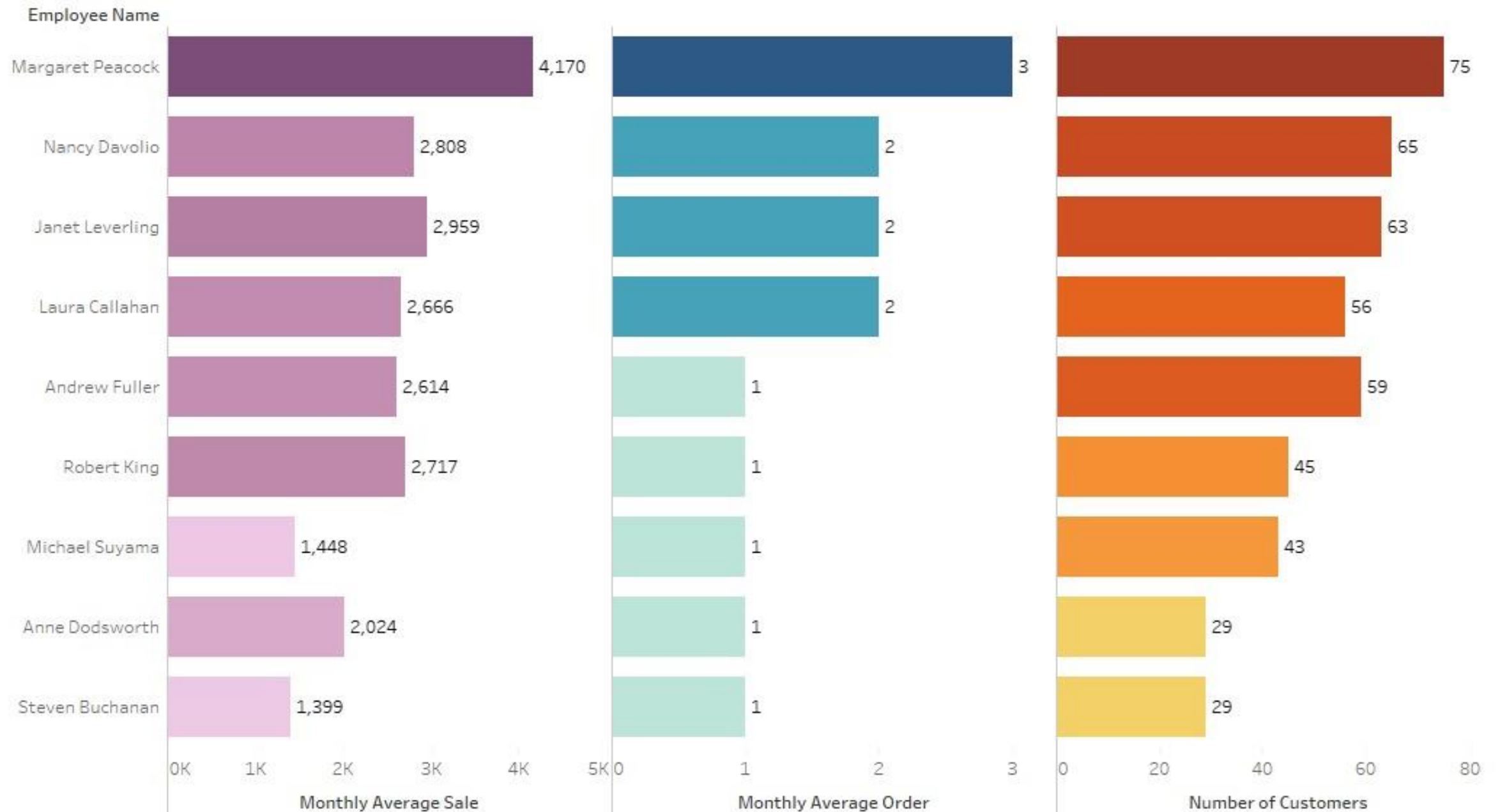
$$\text{MAO} = \text{TOTAL ORDERS} \div \text{EMPLOYEE TENURE}$$

No. Of Customers Served by Employee

- ▶ Number Of Customers: Customers served by employee is a metric that quantifies the number of customers or clients served or assisted by individual employees.



Employee Ranking Metrics



Employee Performance Time Series Analysis

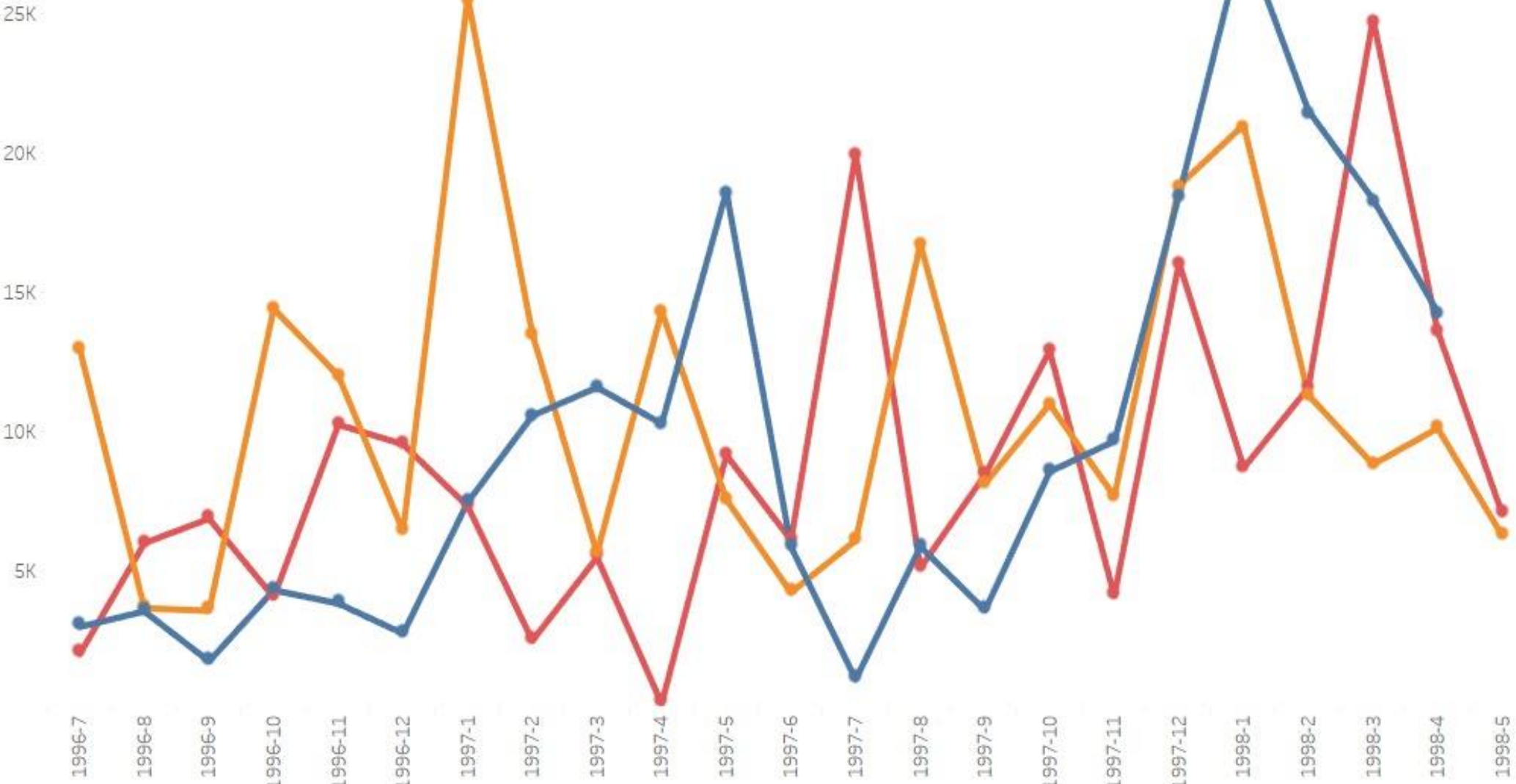
Year Months

Employee Name

Janet Leverling

Margaret Peacock

Nancy Davolio



Proposed Solutions and Expected Outcomes:

- ▶ Motivate and enhance employee performance by implementing performance-based incentives, setting clear goals, and fostering a collaborative work culture.
- ▶ High-performing employees can significantly boost company revenue, and incentivizing them further encourages consistent excellence and drives profitability.

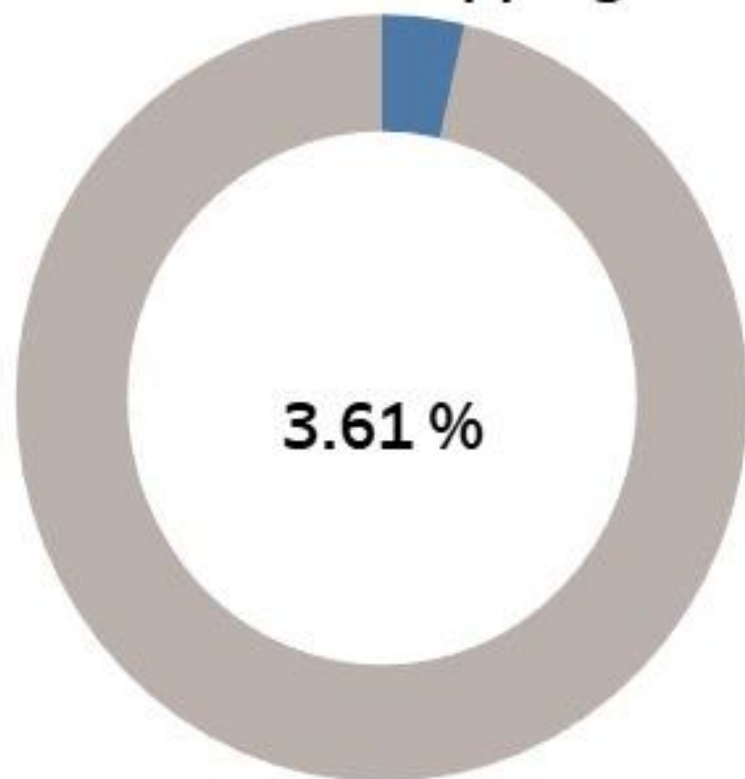
Shipping Performance:

- ▶ **On-Time Delivery Rate** measures the percentage of shipments that are delivered according to their scheduled delivery date.
- ▶ **Average Freight Cost** how much each shipment company charges on average.

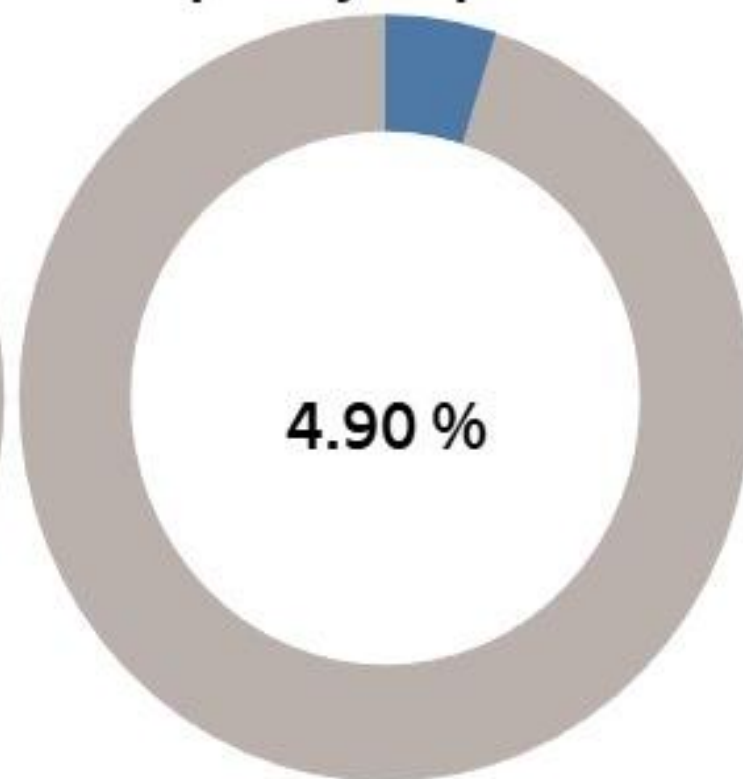


Percent delayed orders by companies

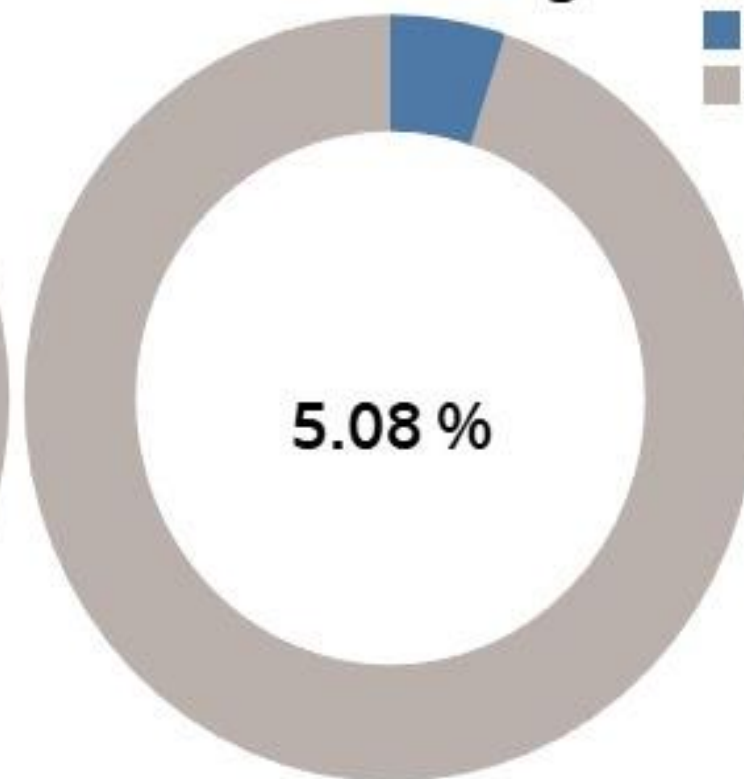
Federal Shipping



Speedy Express



United Package



Measure Names

Pct Delayed Orders

Pct On Time Orders

Proposed Solutions and Expected Outcomes

- ▶ **Suggestion:**
 - ▶ Enhance route optimization,
 - ▶ Real-time tracking
 - ▶ Efficient warehouse operations to minimize delays.
- ▶ Improving on-time delivery rate boosts customer satisfaction, loyalty, and trust, leading to increased repeat business and positive word-of-mouth.



Thank You

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