RETAIL DATA ANALYSIS AND INSIGHTS

BY -

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AGENDA

- Data Overview
- Data Inspection
- Data Handling and Data Cleaning
- EDA - High Level Metrics
- Customer Behaviour
- Sales Trends
- Store & Product Analysis
- Insights
- Recommendations

INTRODUCTION

▶ **Aim :** To analyse sales and customers behaviour to provide actionable insights.

▶ **Objectives :** Improve sales, enhance customer acquisition and customer retention strategies.
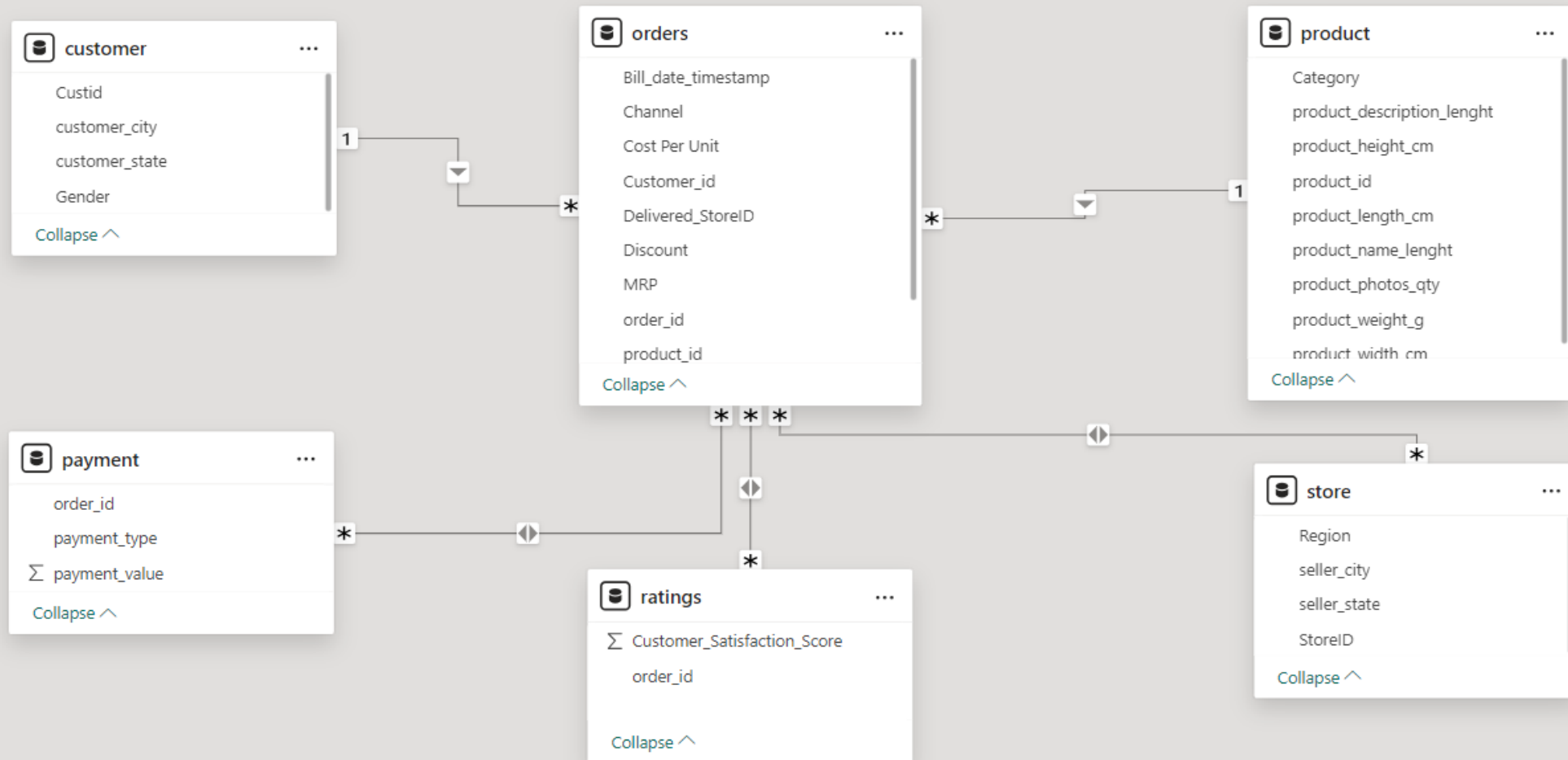
DATA OVERVIEW

▶ **Data Sources :**

Customers, Orders, Payments, Products, Ratings, Stores

▶ **Data Structure :**

▶ Customers – Rows : 99441, Columns : 4

▶ Orders – Rows : 112650, Columns : 11

▶ Payments – Rows : 102460, Columns : 3

▶ Products – Rows : 32951, Columns : 9

▶ Stores – Rows : 534, Columns : 3

▶ Ratings – Rows : 98874, Columns : 2

DATA MODELLING

DATA INSPECTION

- Duplicate and Missing values
- Date format inconsistency
- Payment amount and Total Amount problem
- One order having multiple stores
- Multiple customers having same order
- One Product category is not defined
- Orders present in payment but not in orders table

DATA CLEANING

▶ Handling missing values and duplicates by removing the records.

▶ Replacing the quantity by 1 for such orders where the payment value and sales amount is not same.

▶ Replacing the stores with the first occurring store where multiple store mapped to one order.

▶ For the customers having same orders, deleting the record of one customer.

DATA CLEANING

▶ Updated not defined category of #NA to unknown category in product table.

▶ Deleted the order which are present in payment.

  but not present in orders table.

▶ Total amount column updated as (Quantity *MRP) – Discount.

EXPLORATORY DATA ANALYSIS – HIGH LEVEL METRICS

- ▶ Number of Orders : 98,666
- ▶ Number of Customers : 98,575
- ▶ Total Discount : 5.52 lakhs
- ▶ Total Sales : 1.59 Cr
- ▶ Total Profit : 22.51 lakhs
- ▶ Total Quantity : 1,12,500
- ▶ Average sales per customer : Rs 161
- ▶ Average profit per customer : Rs 23
- ▶ Average discount per customer : Rs 5

ANALYSIS ON HIGH LEVEL METRICS

▶ The repeat purchase rate is 0.1 % and the repeat customer percentage is 0.04 % while the one time buyers percentage is 99.96 %. highlighting for improving customer retention strategies.

▶ The average sales per customer is Rs 161, showing that each customer contributes significantly to the overall sales.

ANALYSIS ON HIGH LEVEL METRICS

▶ The average profit per customer is Rs 23 and the overall percentage of profit on total sales is 22.8 % . This indicates that despite the low retention rate, the business is maintaining a good profit margins.

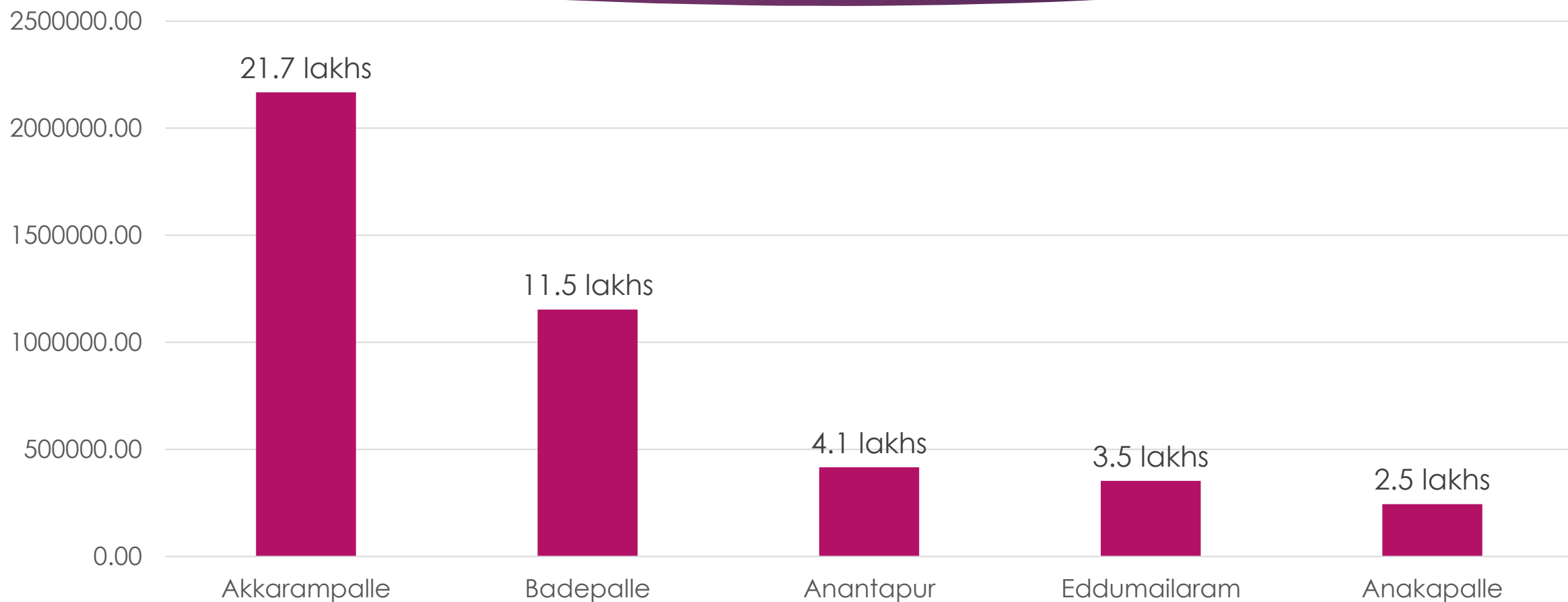▶ There are 32,951 unique products across 14 categories, suggesting a diverse product offerings.

CUSTOMER ANALYSIS – SEGMENTATION

Segmentation of customers based on revenue

11 lakhs, 7%

20 lakhs, 13%

93 lakhs, 59%

34 lakhs, 21%

- Preminum
- Gold
- Silver
- Standard
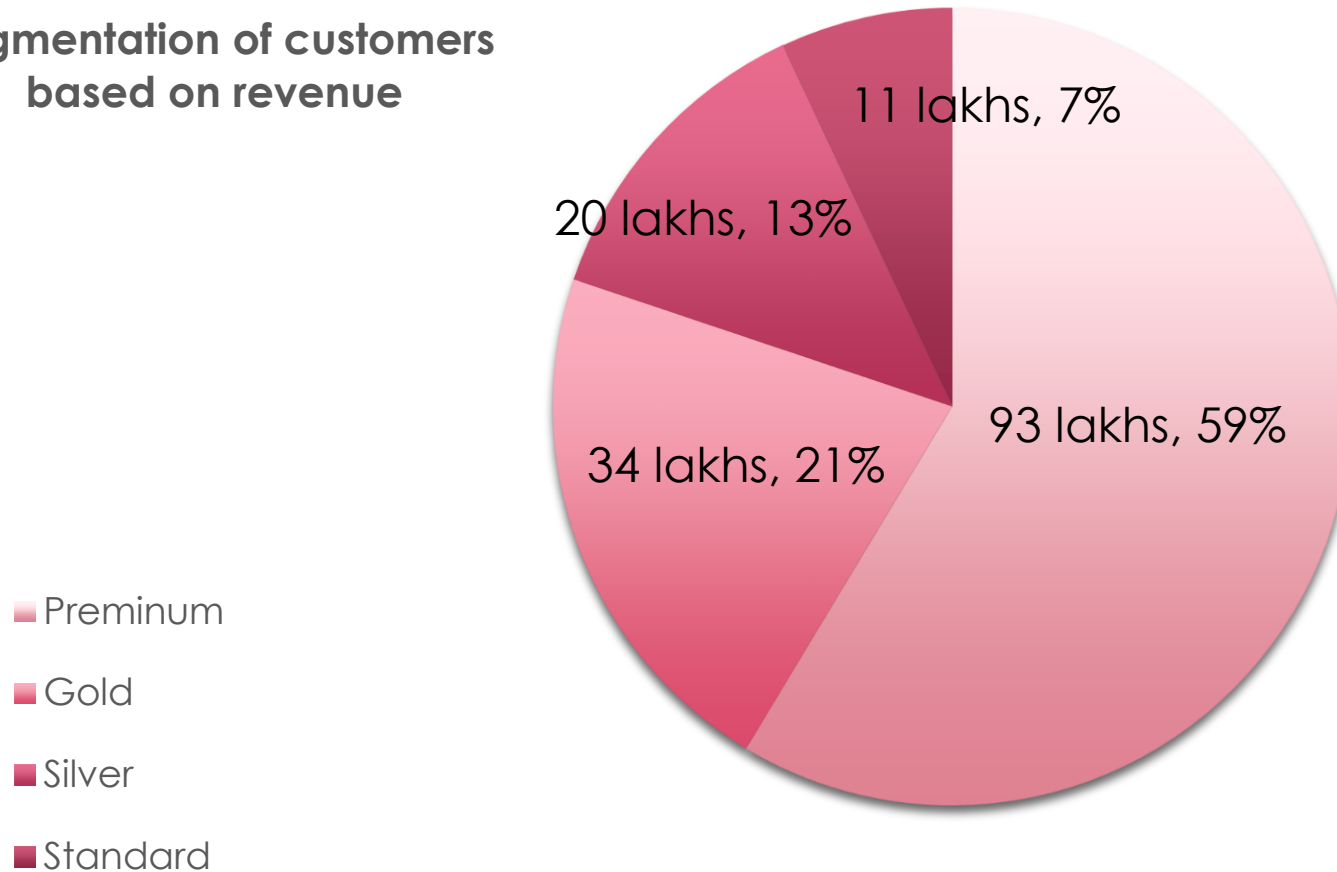
CUSTOMER BEHAVIOUR ANALYSIS

Top 5 Cities based on Sales

CUSTOMER ANALYSIS

▶ **Customer Preferences:**

    ▶ Preferred Channel : INSTORE - 86 % customers

    ▶ Preferred Payment Method :

      CREDIT CARD – 76 % customers

    ▶ Preferred Store : ST103 – 26 % customers

    ▶ Preferred Category : TOYS & GIFTS – 15 % customers

CUSTOMER ANALYSIS

▶ Behaviour of One-Time vs Repeat Buyers:

　　▶ One time buyers contribute 99.89 % of the total sales comparing the repeated buyers to only 0.11 %.

　　▶ The average quantity per order for both type of buyers is 1.10

	Type_buyer	total_sales	no_of_orders	total_quantity
1	One time buyer	15826736.43	98537	112508
2	Repeated buyer	16960.27	132	145

RFM SEGMENTATION

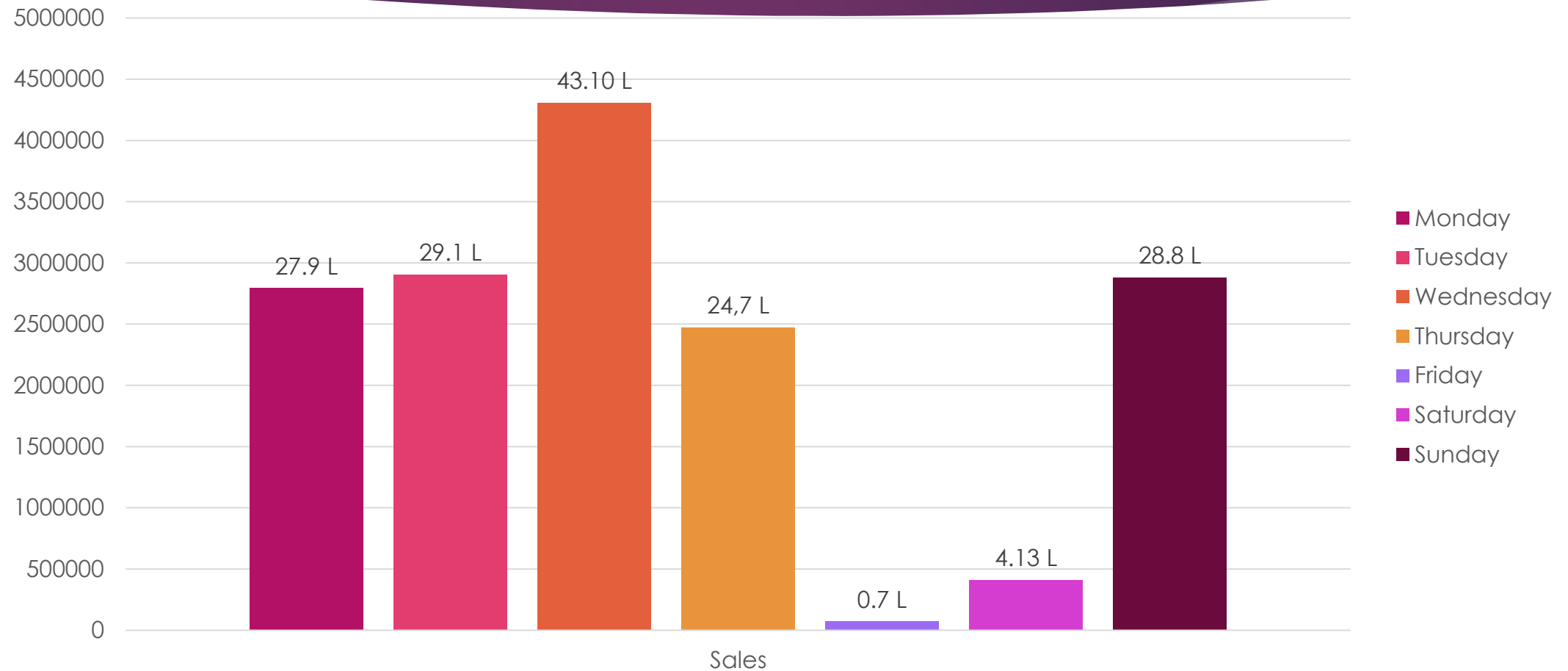|	segment	customer_count	avg_recency	avg_frequency	total_monetary
1	Premium	23843	105	1	6171017.3
2	Gold	38558	209	1	5418792.64
3	Standard	6250	470	1	267957.13
4	Silver	29924	384	1	3985929.63
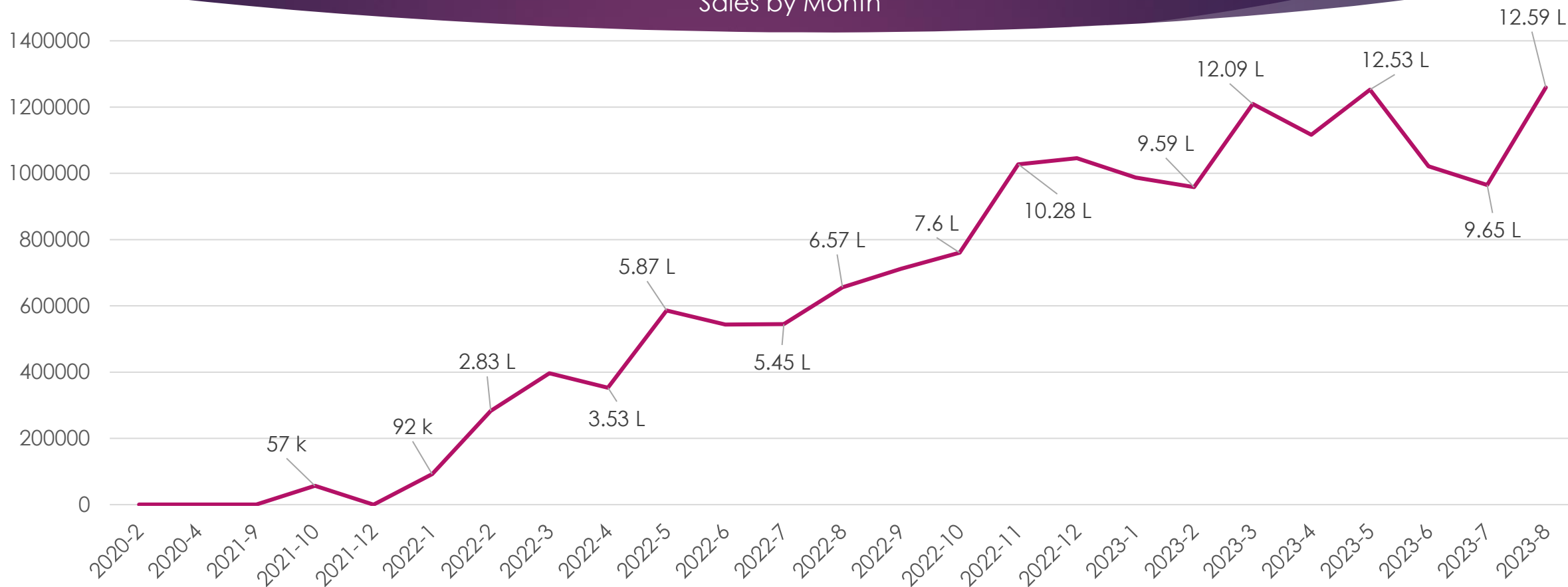
SALES ANALYSIS – TRENDS

Weekday vs weekend Sales
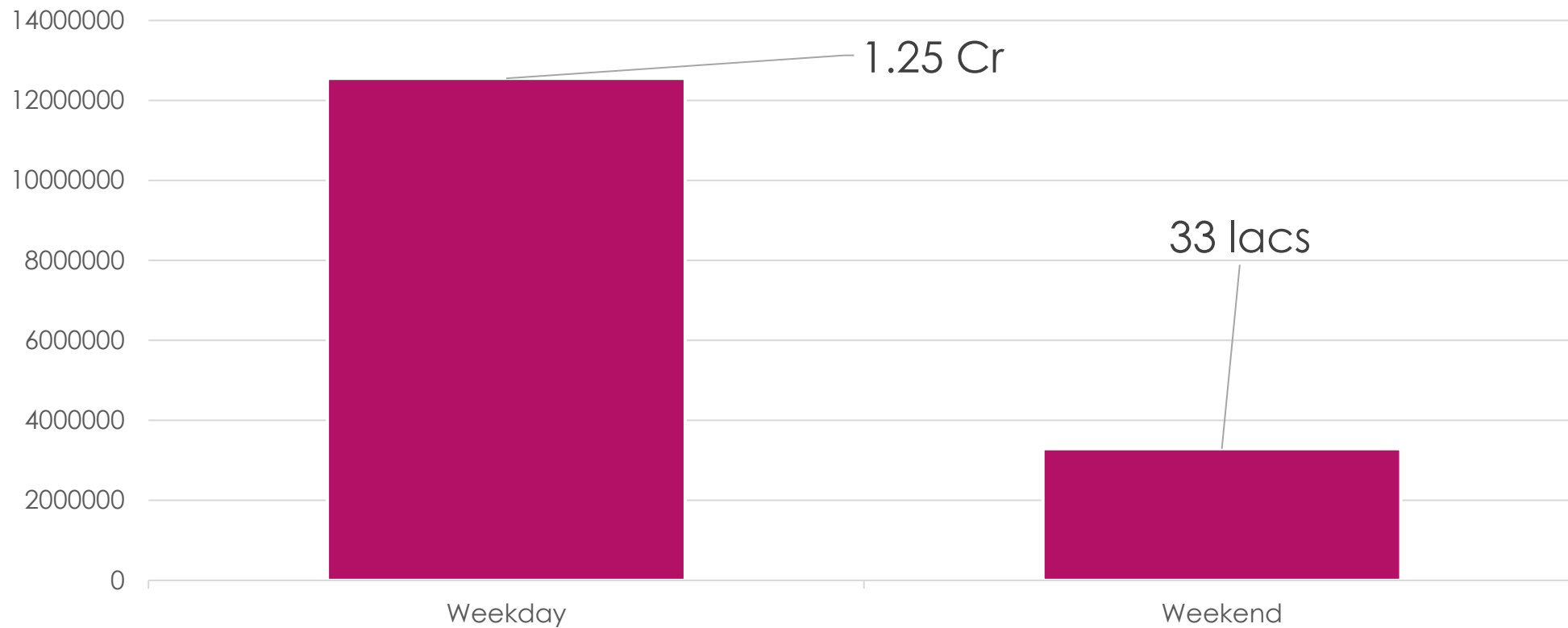
SALES ANALYSIS – TRENDS

- The sales are higher on weekdays, especially mid-week compared to weekends. This could indicate that customers are more likely to make purchases during the working days.

- The sales peak on Wednesday, contributing 27 % of the overall sales.

- August 2023 had the highest sale of 12.6 lakhs , contributing approx. 8% of the total sales.

STORE PERFORMANCE

▶ **Top 10 stores by sales:**

	Delivered_StoreID	cnt
1	ST103	3389280.34
2	ST143	939049.38
3	ST106	722194.79
4	ST102	585204.79
5	ST125	542145.36
6	ST410	516717.01
7	ST167	470034.89
8	ST180	452785.54
9	ST132	409504.03
10	ST218	399052.77

Worst 10 stores by sales:

	Delivered_StoreID	cnt
1	ST354	161187.46
2	ST463	196348.91
3	ST112	197571.2
4	ST177	201294.31
5	ST135	203024.78
6	ST199	216533.65
7	ST253	220458.4
8	ST166	220550.64
9	ST230	225354.82
10	ST133	225615.34

PRODUCT ANALYSIS

▶ **Top 10 most expensive products:**

|	product_id	amt
1	dd113cb02b2af9c8e5787e8f1f0722f6	7990.31
2	69c590f7ffc7bf8db97190b6cb6ed62e	7060.21
3	489ae2aa008f021502940f251d4cce7f	6929.31
4	1bdf5e6731585cf01aa8169c7028d6ad	6861.66
5	a6492cc69376c469ab6f61d8f44de961	4950.34
6	c3ed642d592594bb648ff4a04cee2747	4764.34
7	259037a6a41845e455183f89c5035f18	4728.78
8	a1beef8f3992dbd4cd8726796aa69c53	4513.32
9	4ca7b91a31637bd24fb8e559d5e015...	4320.76
10	6cdf8fc1d741c76586d8b6b15e9eef30	4175.26

CROSS PRODUCT ANALYSIS

▶ **Top 10 combinations of products most bought:**

	product1_name	product2_name	times_bought_together
1	05b515fdc76e888aada3c6d66c201dff	270516a3f41dc035aa87d220228f844c	100
2	36f60d45225e60c7da4558b070ce4b60	e53e557d5a159f5aa2c5e995dfdf244b	48
3	62995b7e571f5760017991632bbfd311	ac1ad58efc1ebf66bfadc09f29bdedc0	36
4	710b7c26b7a742f497bba45fab91a25f	a9d9db064d4afd4458eb3e139fe29167	36
5	35afc973633aaeb6b877ff57b2793310	99a4788cb24856965c36a24e339b6058	30
6	2ef36e1cae01b86d0ff0a2f50ff2bd53	53759a2ecddad2bb87a079a1f1519f73	30
7	308e4e21ae228a10f6370a243ae59995	90b58782fdd04cb829667fcc41fb65f5	30
8	18486698933fbb64af6c0a255f7dd64c	dbb67791e405873b259e4656bf971246	26
9	58efb9b638561ce132216a9a612513e2	872db866d615db59612ac933f43d6b22	25
10	54d7ad85b648d3cb2b7069ed446d7f35	82758517d6c9cc65c509781f1e14e9f2	24
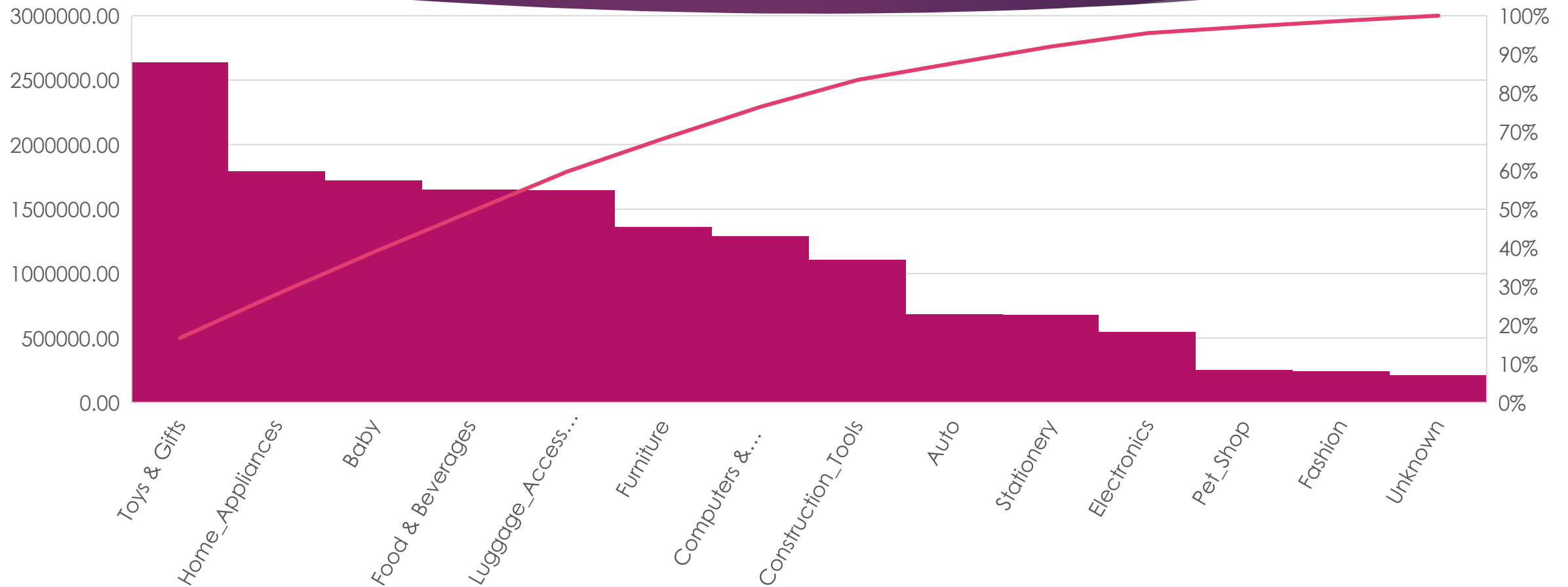
PARETO ANALYSIS

- Insight:
  - Toys and gift is the highest selling category, contributing 20 % to the total sales.
  - Home Appliances, Baby, Food & Beverages are other top performing categories, each contributing a substantial portion to the total sales.
  - The top 4 categories together account for 50 % of the total sales.
  - Categories like Electronics, Pet Shop, Fashion contributes least to the total sales.

RECOMMENDATIONS

▶ **Implement registration programs :**

  ▶ Introduce free registrations programs that provides special rewards for the customers that orders after registering, which gives repeated purchases and long term engagement.

  ▶ Offer special benefits, discounts and early access to new products for registered customers to foster a deeper connection and encourage continuous shopping.

▶ **Marketing Strategies:**

  ▶ Develop marketing campaigns specifically aimed to one time buyers improving the low retention rate.

RECOMMENDATIONS

▶ **Enhancing Products and service Offerings:**

  ▶ Regularly collect feedback from customers to understand their needs and expectations.

  ▶ Use this feedback to enhance product quality and service offerings.

▶ **Optimizing Sales Channels :**

  ▶ Providing a seamless online shopping experience allowing customers to make purchases at any time, increasing sales and trust towards the company.

THANK YOU

Q & A