"Marketing Analytics and Strategic Insights for Top-10 Mobiles”

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Introduction

Data analytics and visualization is used in this project to study in detail how products perform.

The project’s objectives is:

1. Understanding customer behaviour and preferences.
2. Identifying high-performing products.
3. Developing effective marketing strategies.
4. Analyzing sales trends for strategic planning.

Dataset Overview

- **Invoice Information:** INV NO, Bill Code, Bill No, Year, INV Date, INV Time, Month.
- **Customer and Product Details:** Customer, Mobile, GST No, PAN, Category, Brand, Model, Color, Quantity, Sale Rate, Sale Price(INC), Purchase Price(INC).
- **Financial Data:** GST(%), CGST, IGST, SGST, Profit.
- **Payment Details:** Cash, Cheque, Card, Wallet, Finance.
- **Additional Information:** IMEI, Barcode, SFID, Wallet Name, Finance Name, Credit, Purchase Date, State Code & Name, Remark, Status.

Data Preprocessing

- Data Cleaning
- Feature Engineering

Data Cleaning

- Unnecessary columns such as PROFIT, Cal, PROFIT_M, PURCHASE PRICE(PD), SFID, STATE CODE, STATE NAME, CGST, SGST, IGST, BARCODE, and IMEI were removed.
- Identifying Missing Values.
- Filled Missing Values.
- Duplicates were removed from the dataset.
- Overall missing percentage was calculated.

Feature Engineering

- Converted Invoice Time into Hours and Minutes.
- Calculated Time Difference Between PURCHASE DATE and INVOICE DATE.
- Categorized Customers as 'New' or ‘Old’.
- Reclassified PRODUCT Categories.
- Reclassified the STATUS Column.

Customer Segmentation

The objective is to identify key customer segments by brand and category performance, sales trends, and payment preferences.

- This table contains RFM for each brand and Category.
- It highlights the brands and categories which have high frequency and monetary value.
- Talk about indicators of engaged customers in the form of low recency (recent purchases).

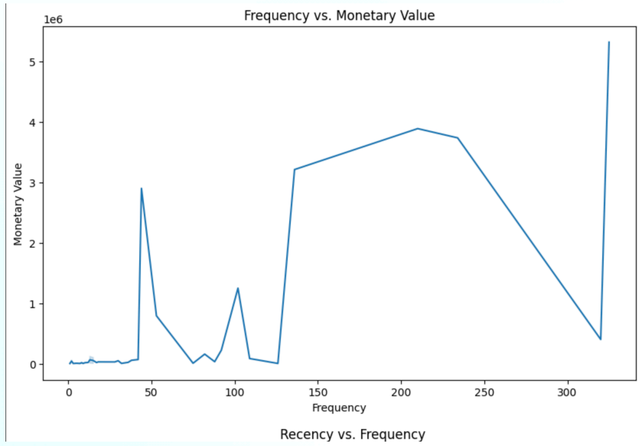
BRAND	CATEGORY	Recency	Frequency	MonetaryValue
APPLE	ELECTRONIC GADGETS	435	5	9500
APPLE	MOBILE ACCESSORIES	445	38	58103
APPLE	MOBILES & TABLETS	435	44	2899536
BOAT	ELECTRONIC GADGETS	430	320	402728
CONEKT	ELECTRONIC GADGETS	460	1	1500
DEFY	ELECTRONIC GADGETS	449	9	9
FIRE BOLTT	ELECTRONIC GADGETS	440	82	160339
GIZMORE	ELECTRONIC GADGETS	630	9	4999
HP	ELECTRONIC GADGETS	600	1	40000
HP	OTHERS	460	1	1
INTEX	ELECTRONIC GADGETS	434	126	6313
ITEL	MOBILES & TABLETS	442	30	50676
MI	ELECTRONIC GADGETS	431	17	21693
MI	MOBILE ACCESSORIES	463	15	6091
MI	MOBILES & TABLETS	434	102	1250494
MICROMAX	MOBILES & TABLETS	435	7	7900
MINIX	ELECTRONIC GADGETS	432	42	70797
MOTOROLA	MOBILES & TABLETS	467	2	28100
NOISE	ELECTRONIC GADGETS	570	8	24798
NOISE	MOBILES & TABLETS	433	8	10446
NOKIA	MOBILES & TABLETS	431	92	225052
NOTHING	MOBILE ACCESSORIES	668	1	1950
NOTHING	MOBILES & TABLETS	477	2	61999
OMTHING	ELECTRONIC GADGETS	544	3	5834
ONEPLUS	ELECTRONIC GADGETS	430	18	31858
ONEPLUS	MOBILE ACCESSORIES	498	13	11306
ONEPLUS	MOBILES & TABLETS	430	136	3210594
OPPO	ELECTRONIC GADGETS	473	12	22718
OPPO	MOBILES & TABLETS	430	325	5315828
POCO	MOBILES & TABLETS	440	13	121621
PORTRONICS	ELECTRONIC GADGETS	430	109	87344

Connected to Python 3 Google Compute Engine backend

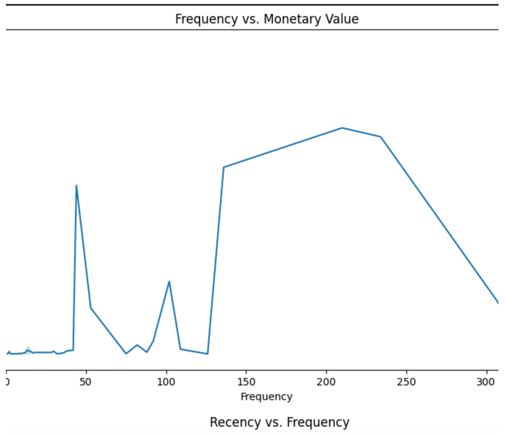
RFM for each Brand & Category

- Product categories or brands that achieve high frequency and high monetary value represent loyal customers who are putting in work for the revenue.

- Categories or brands where the customer has started frequenting recently and discussion around them can drives engagement with the custom



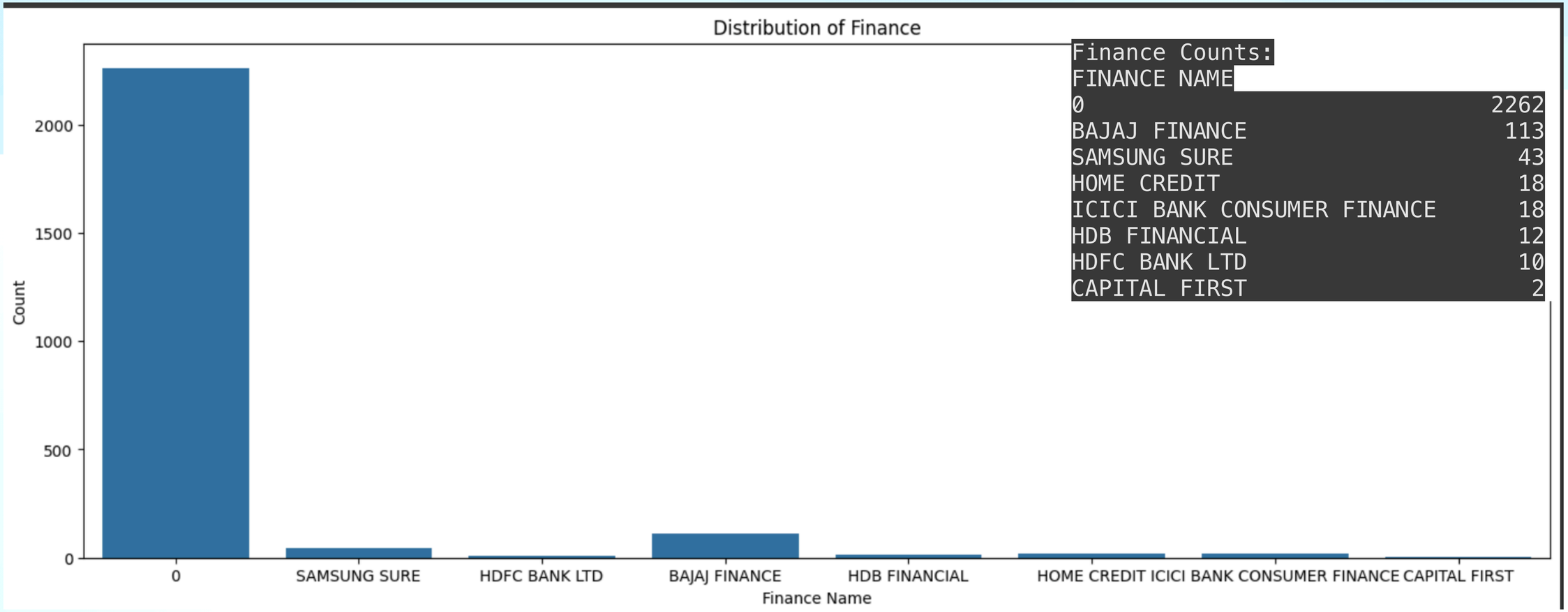
Recency vs Frequency



Frequency vs Monetary Value

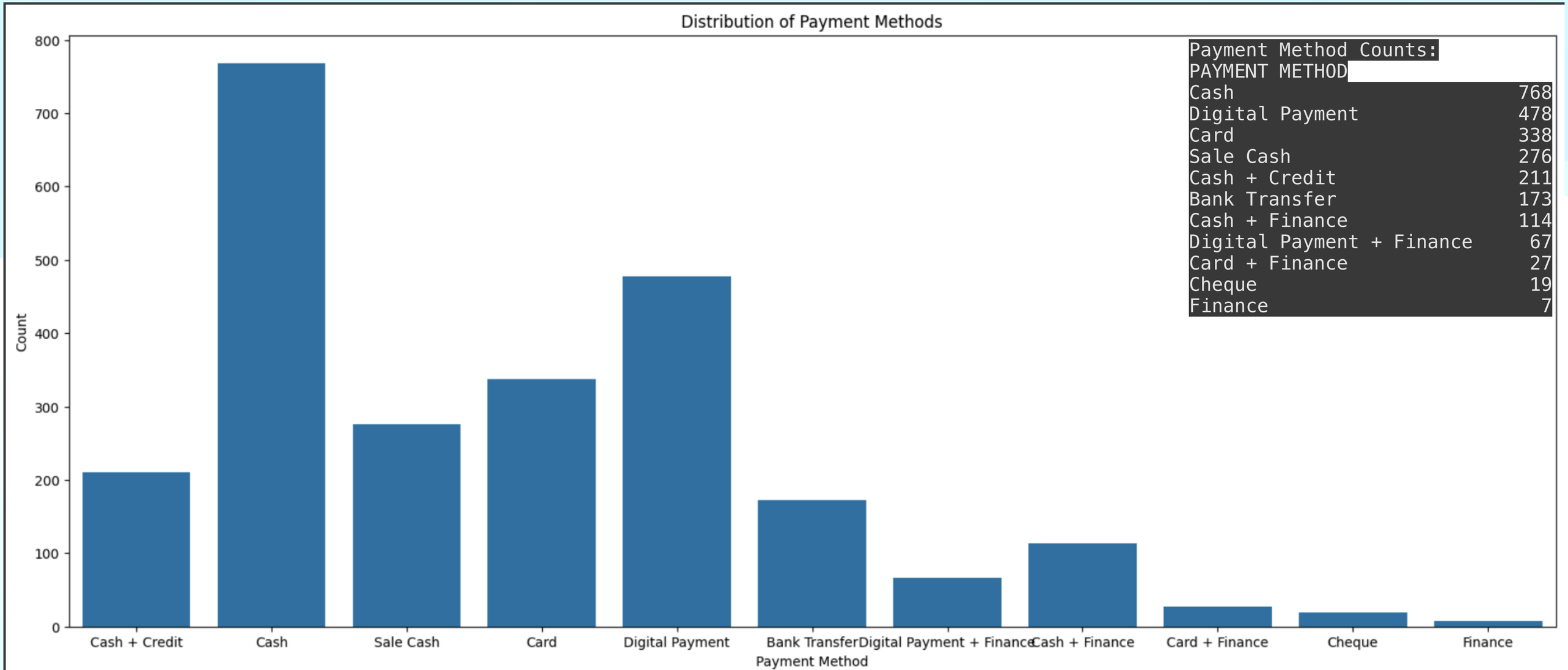
Customer Distribution by Payment

- To analyze which financial institutions or services are most used by customers to pay for products.
  - The analysis shows the reuse pattern of financial institutions or services (e.g. Bajaj Finserv, HDFC, ICICI) by customers.It shows how popular certain finance providers are.



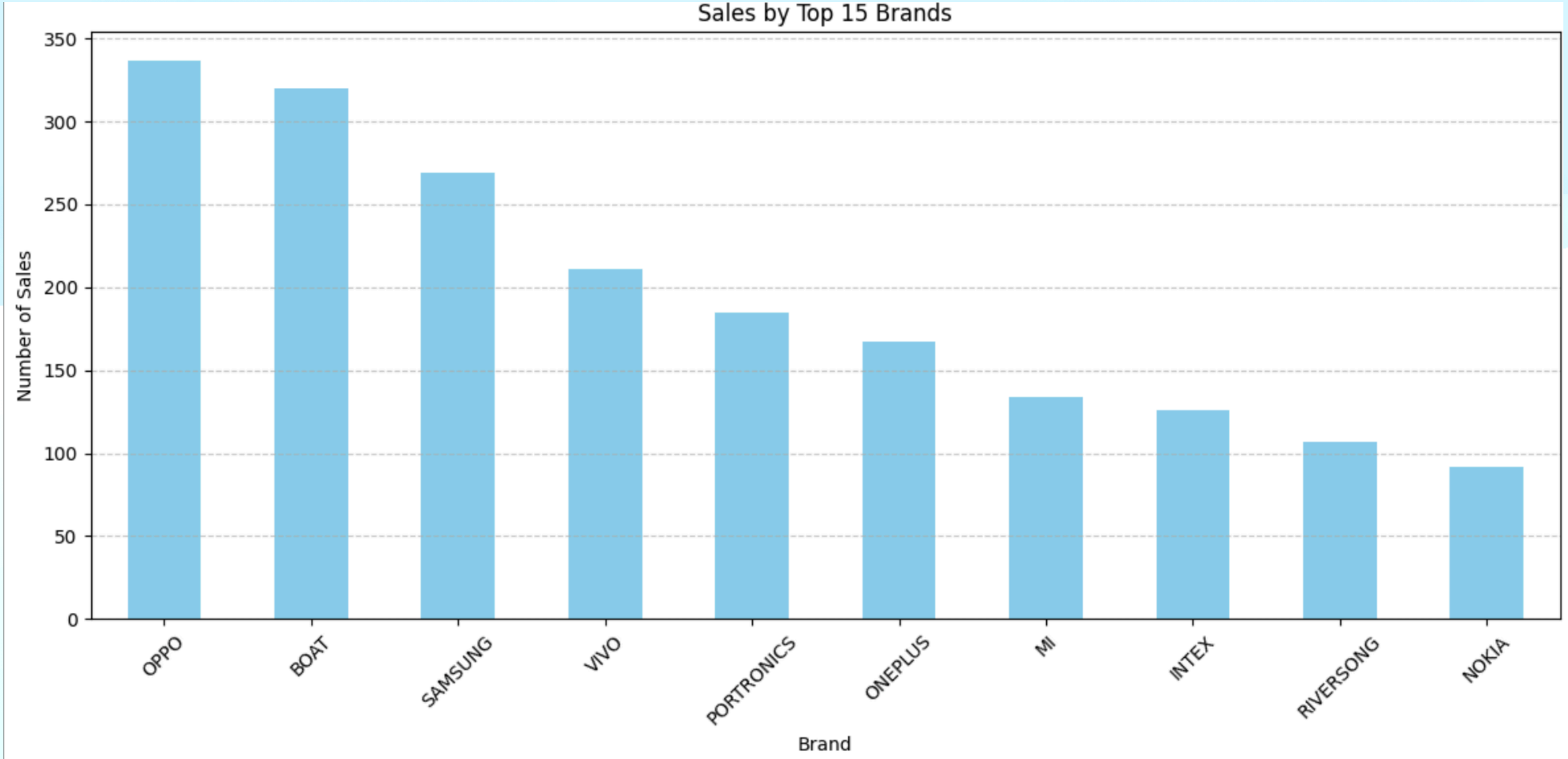
- It will help you understand which payment methods a customer prefers and later on helps to know the transaction trends.

  - Payment method counts are the total number of transactions you completed with that payment method (cash, credit/debit card, wallet, finance).

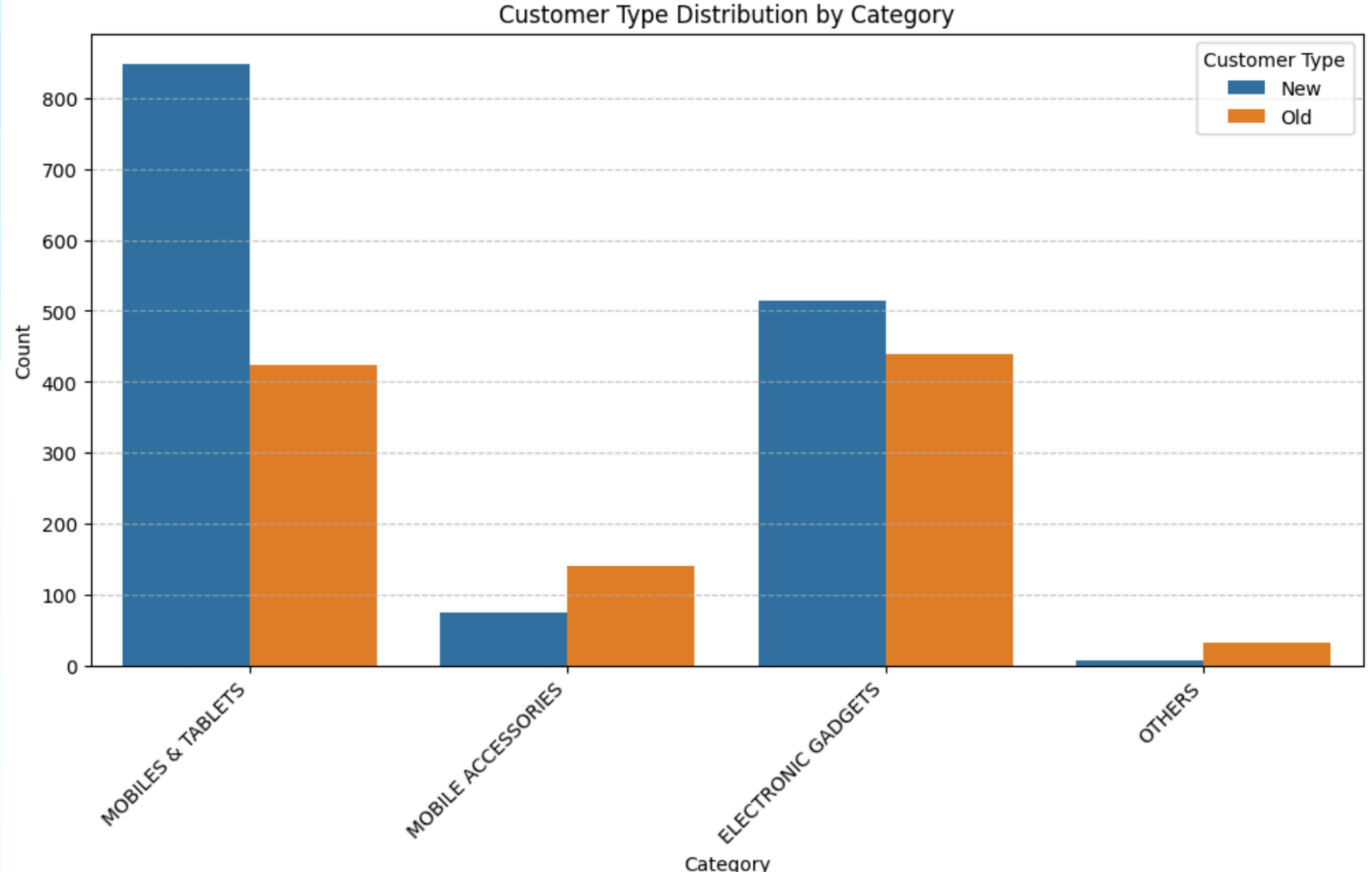


- To calculate sales distribution across various brands and find out the best performing ones.

  - Total sales figures for each brand in the dataset are printed.It shows which are the most popular brands in terms of sales volume.

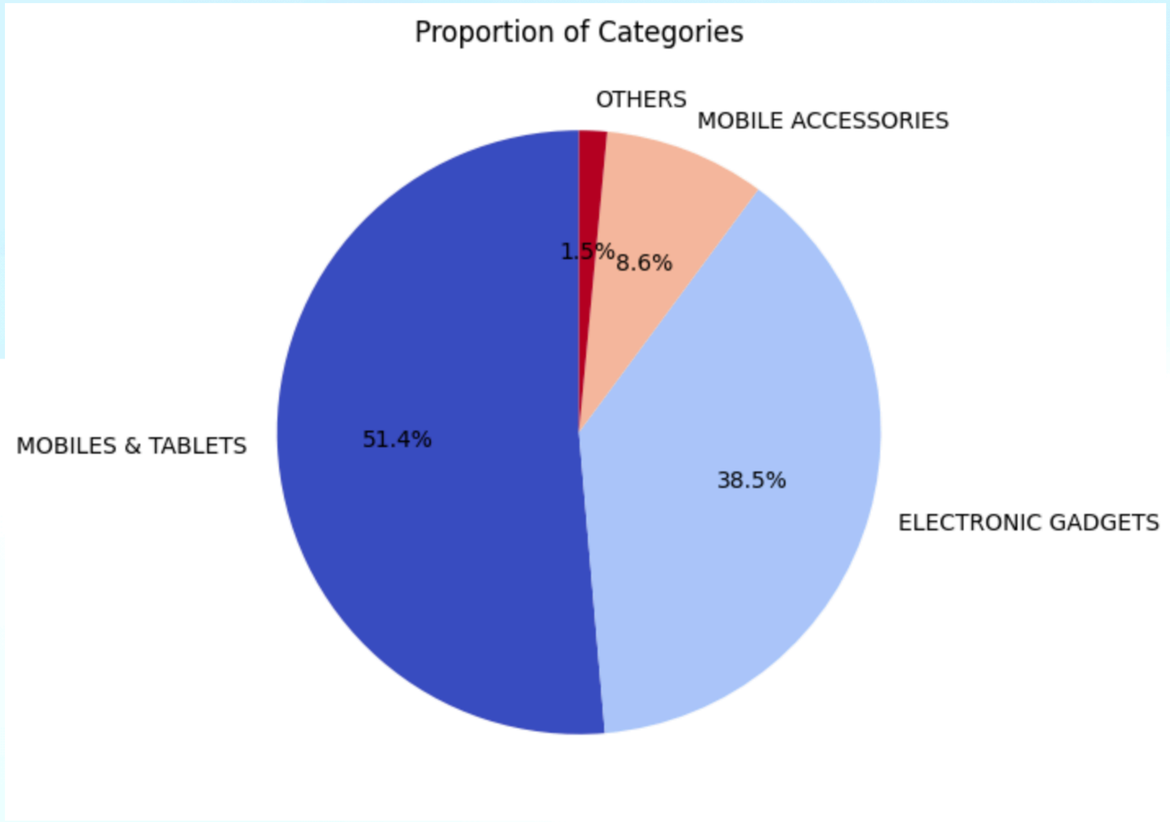


- The distribution of customer types by product categories can be seen in this visualization.
- Moreover, it enables knowing which of the categories get certain customer types and consequently targets potential customers.



Product Segmentation

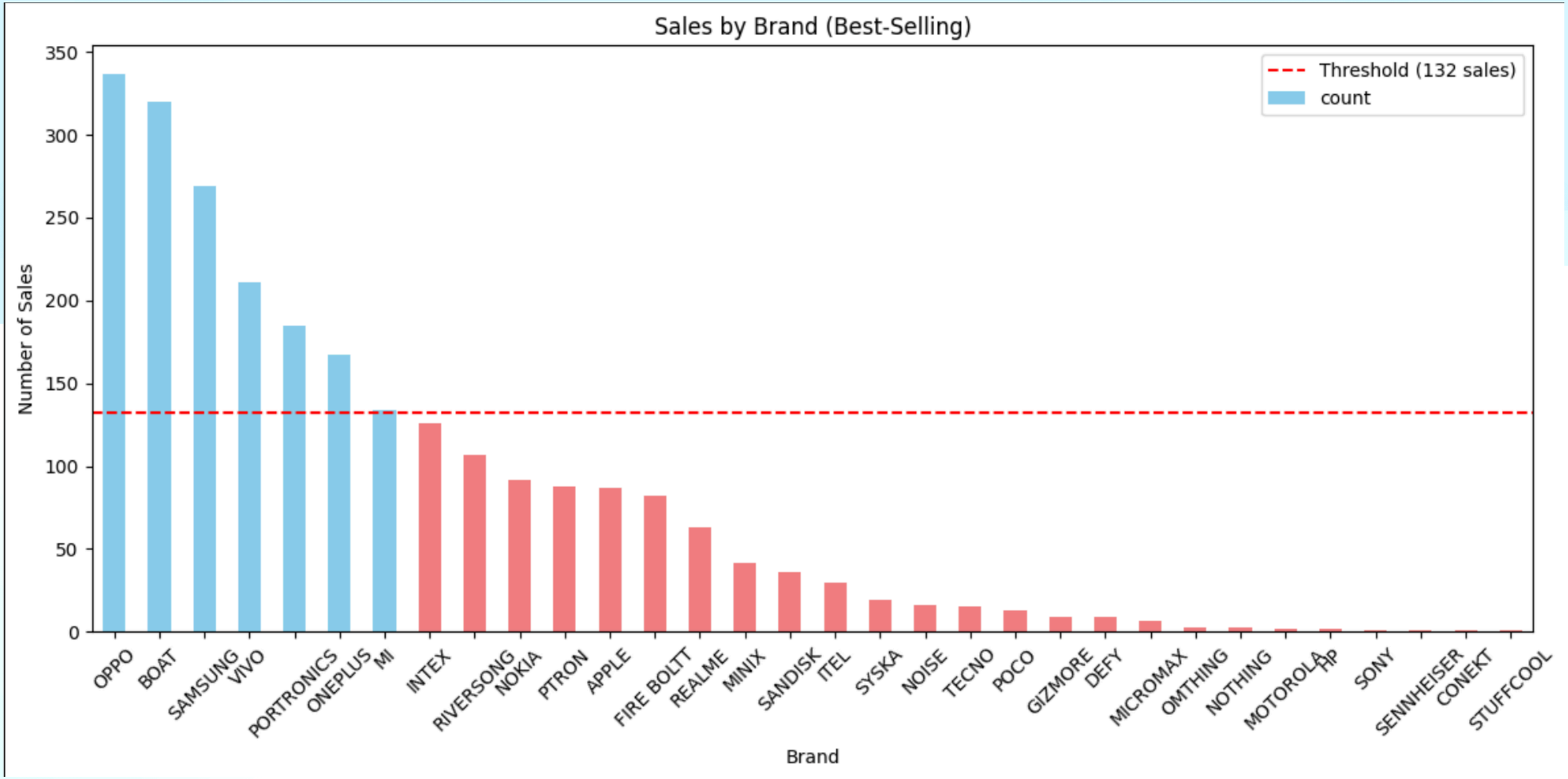
- The pie chart shows what proportion of the sales has been contributed by the different product categories
- A figure that emphasizes the main categories and what share of the selling they constitute.



CATEGORY	SALE PRICE(INC)
ELECTRONIC GADGETS	981365
MOBILE ACCESSORIES	154408
MOBILES & TABLETS	21700906
OTHERS	24432

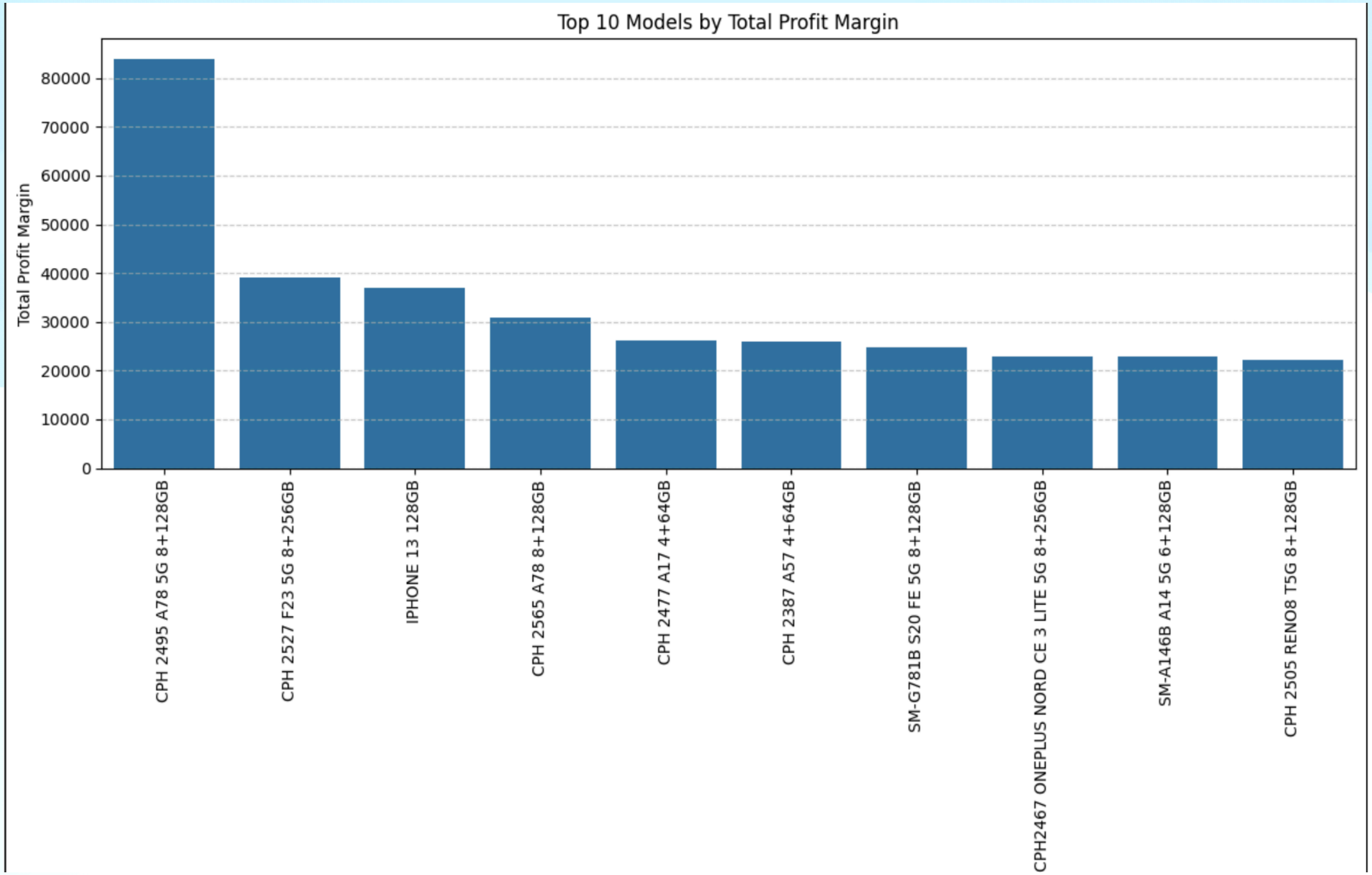
Profit based on Category

- This help to categorize the brands in "Best Selling" and "Not Best Selling" according to a sales threshold.
- Using 80th percentile of sales counts, which determines the threshold.



- Somewhere to help identify the models which are generating the highest profit margins, and also visualize how their contribution impacts the business.

- Grouped the data into MODEL to find the total profit for each model.With sorting I selected the top 10 models with the highest profit margin.

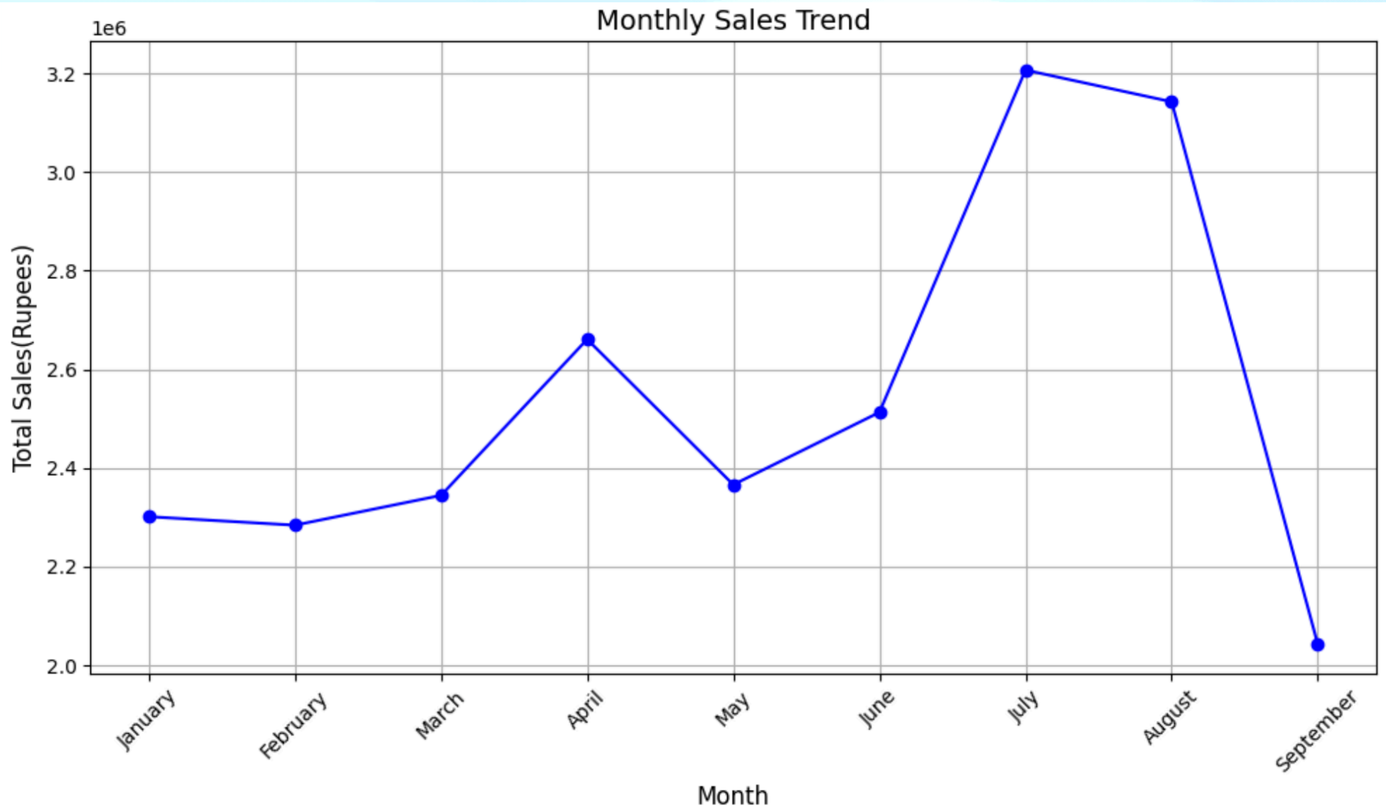


Sales Trend Analysis

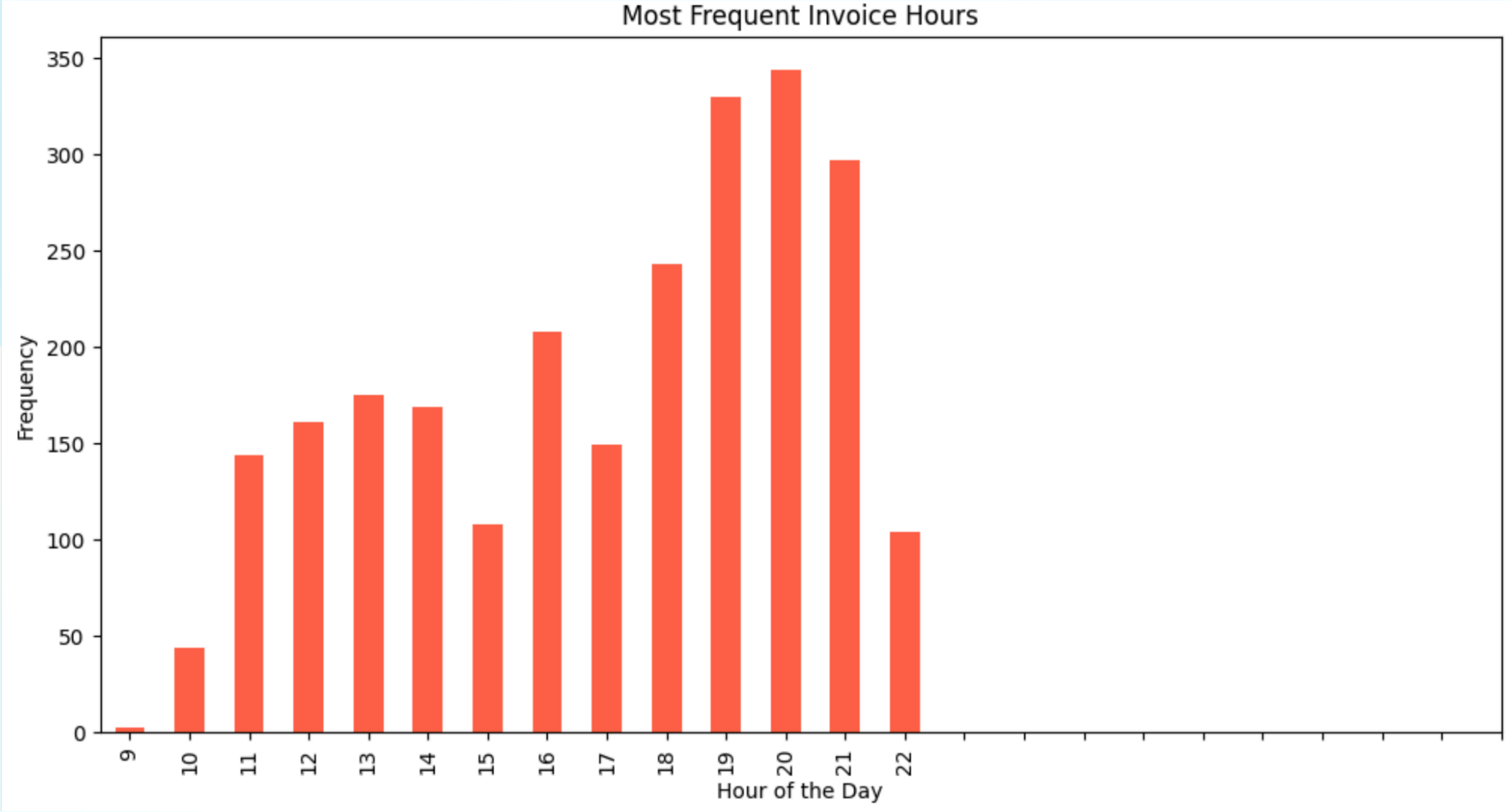
- To understand, analyze and visualize the year round total sales performance.
- The monthly total sales are plotted to help look at how this fluctuates in terms of any seasonal fluctuations or sales pattern.
- There are some peaks and dips, which can suggest when sales were higher (or lower), which can help guide future strategies like a marketing campaign or how to manage our inventory.

Average Purchase Value by Category

Category	Sale (Rupees)
Electronic Gadgets	1028.68
Mobile Accessories	721.53
Mobiles & Tablets	17047.606
Others	660.32



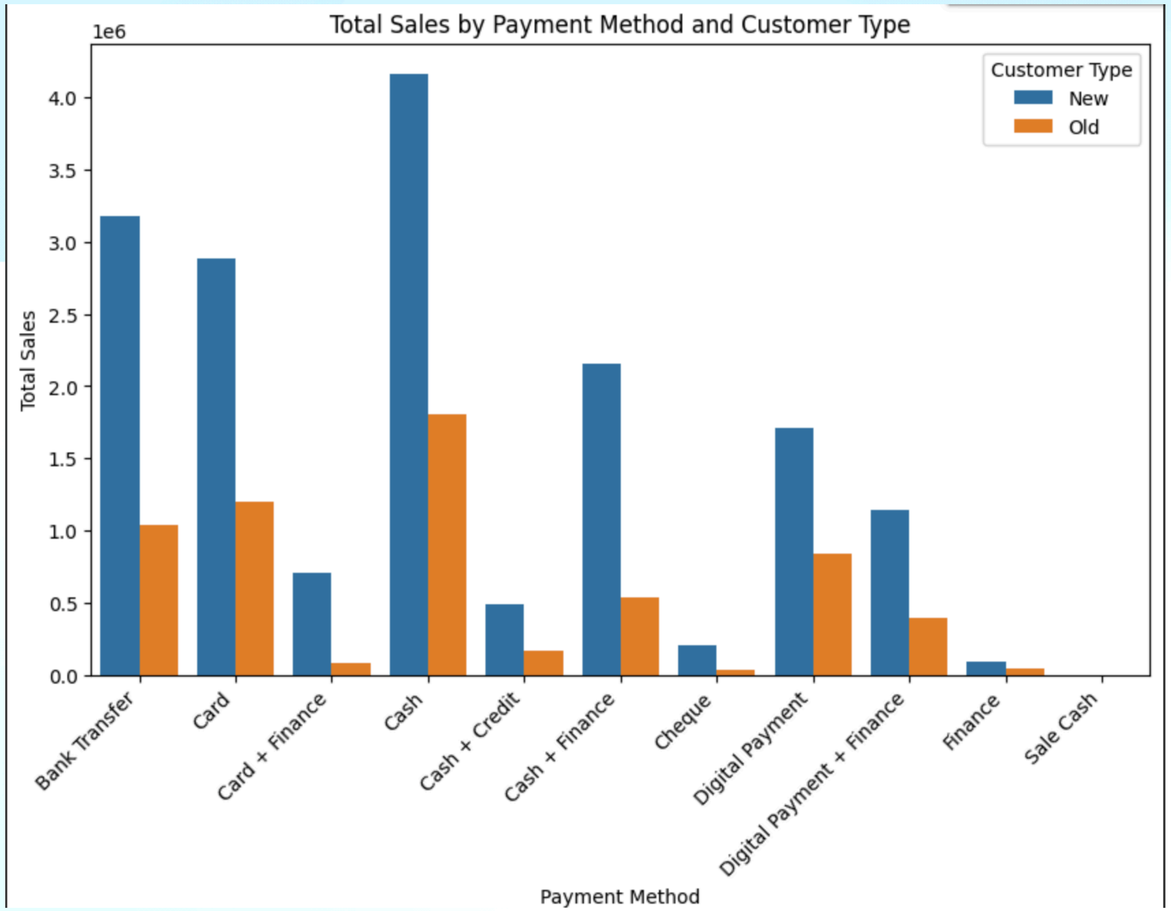
- The purpose was to analyze the most common invoice hours during the day and the peak business hours.
- Peak Hours: Using the information it provides, to identify which hours have the most invoices, and therefore have peak activity.
- Low Traffic Hours: Opportunely, hours with low frequencies indicate possible downtimes to be optimized or restructured.

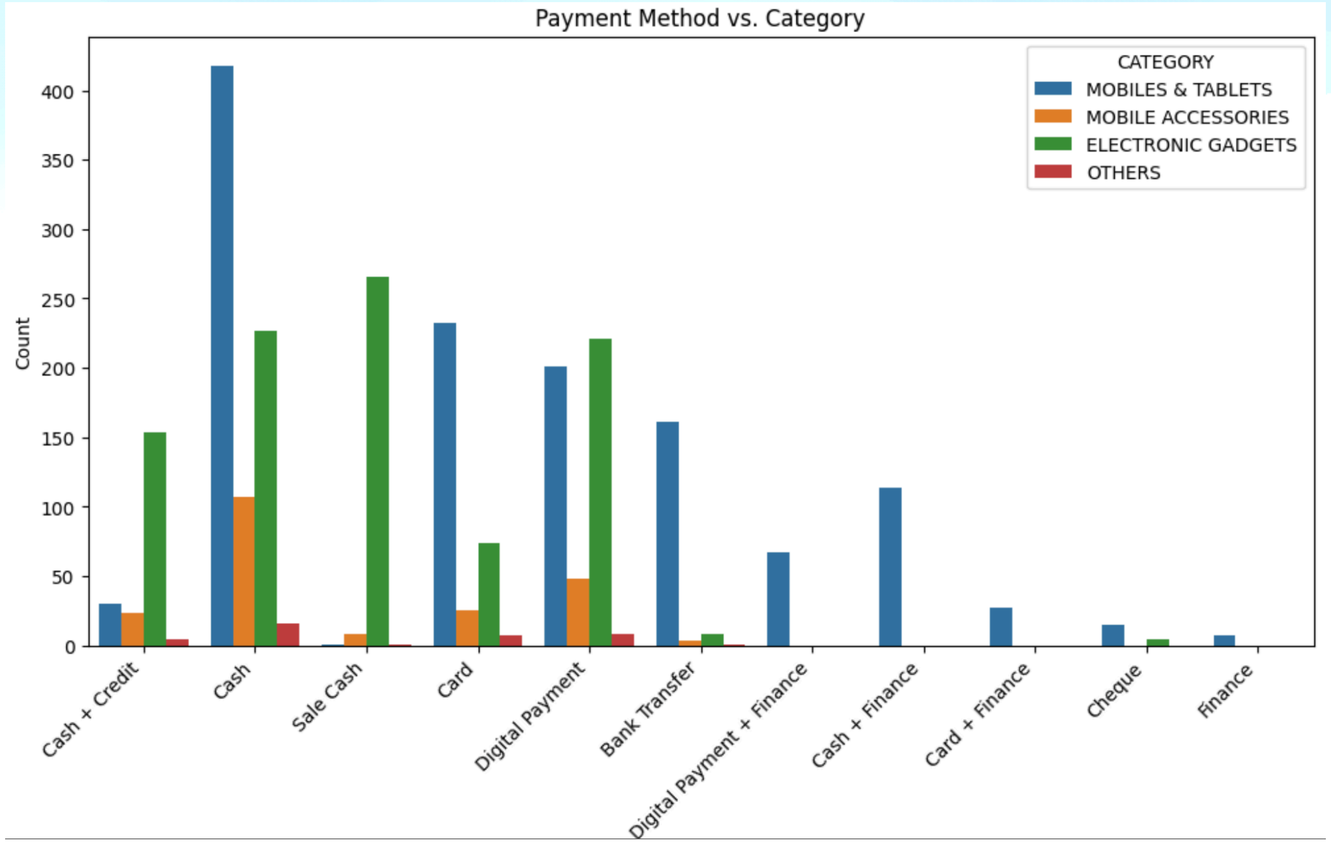


Payment Method Insights

- A countplot will be shown in the plot, where there will be x axis displaying different methods of payments, and y axis showing the count of transactions with respect to those payment methods. After you format the data with color coloring by category will be able to compare how each payment method is utilized on different product categories.

- The result of this analysis has important implications for the customer journey, payment options, and sales growth, and helps optimize payment methods for a desired type of customer.

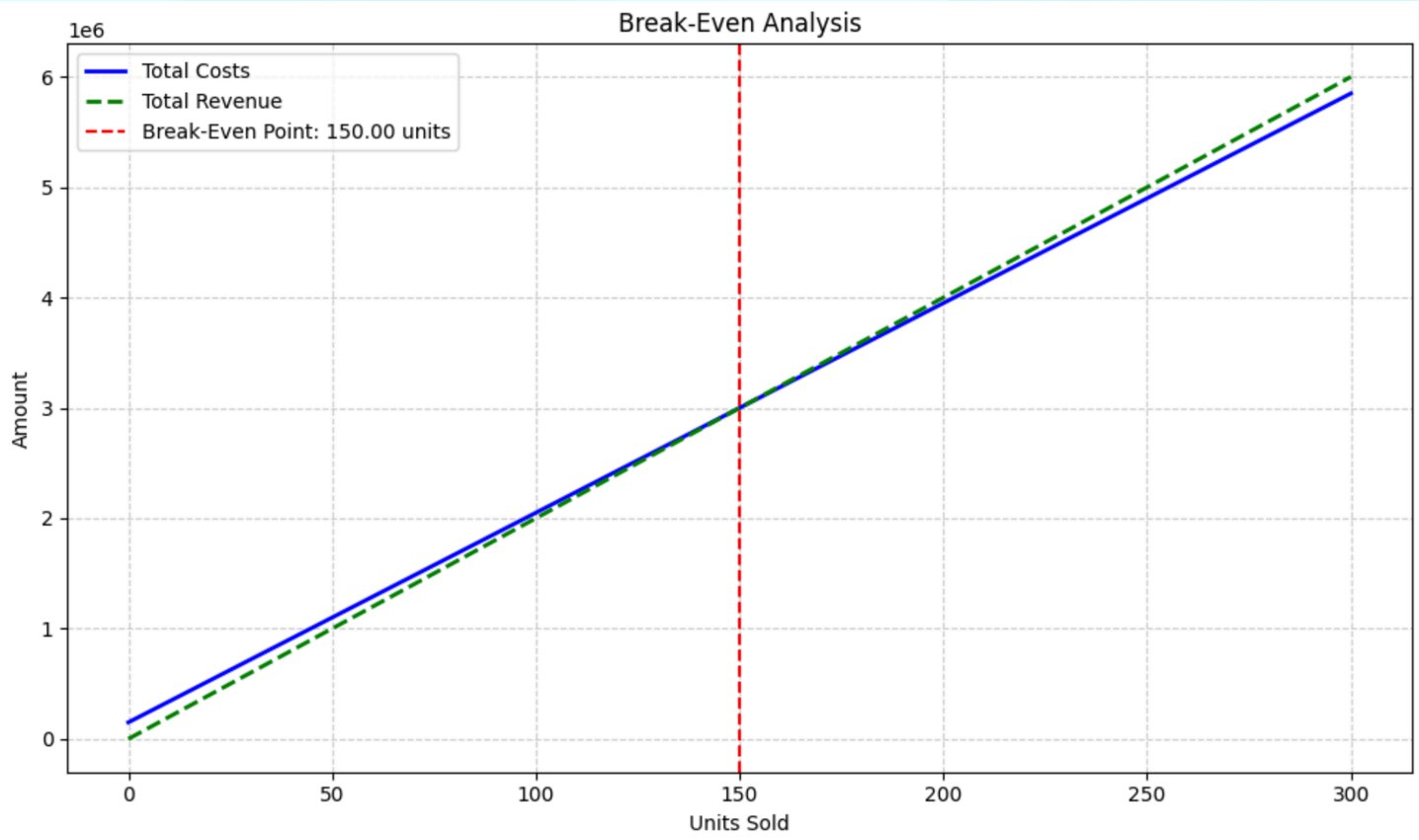




Break-Even Point

- The break even point shows at which point it should break even where, we are selling the amount of units so that all the expenses (both fixed and variable) have been covered.
- Knowing this threshold is very important to businesses who know how to set sales targets and keep a profitable balance.
- At this point, the business is in loss and the total costs are greater than total revenue.
- Once the business crosses over the break even point it starts earning money with total revenue coming in higher than total costs.
- If the Total Revenue line is steeper, the business makes more profit faster when we cross the break even point.

Category	SP_per_unit	VC_per_unit	Break-even_units
Electronic Gadgets	1028.68	934.54	1593
Mobile Accessories	721.53	604.76	1284
Mobiles & Tablets	17047.05	16531.95	291
Others	660.32	508.22	986



Thank You