



# CUSTOMER SEGMENTATION APPLYING CUSTOMER 360 RFM MODEL AND BCG MATRIX

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*Code Reference:* <https://github.com/HienNau/RFM-Project/blob/main/RFM.ipynb>  
*Dashboard:* <https://github.com/HienNau/RFM-Project/blob/main/RFM.pbix>

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# I. Project Overview

- Identifying customer segmentation is essential for creating targeted marketing strategies, improving customer satisfaction and retention, optimizing resources, enhancing product development, gaining competitive advantage, and ultimately increasing profitability. It enables businesses to understand their customers on a deeper level and deliver more personalized and effective solutions.
  - In this study, I apply the CUSTOMER 360 theory, RFM model, and BCG matrix synergistically to analyze the data, generate meaningful insights and ultimately classify customer segments.
  - This report also highlights the significance of each customer segment and provides strategic recommendations.
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## II. Definitions

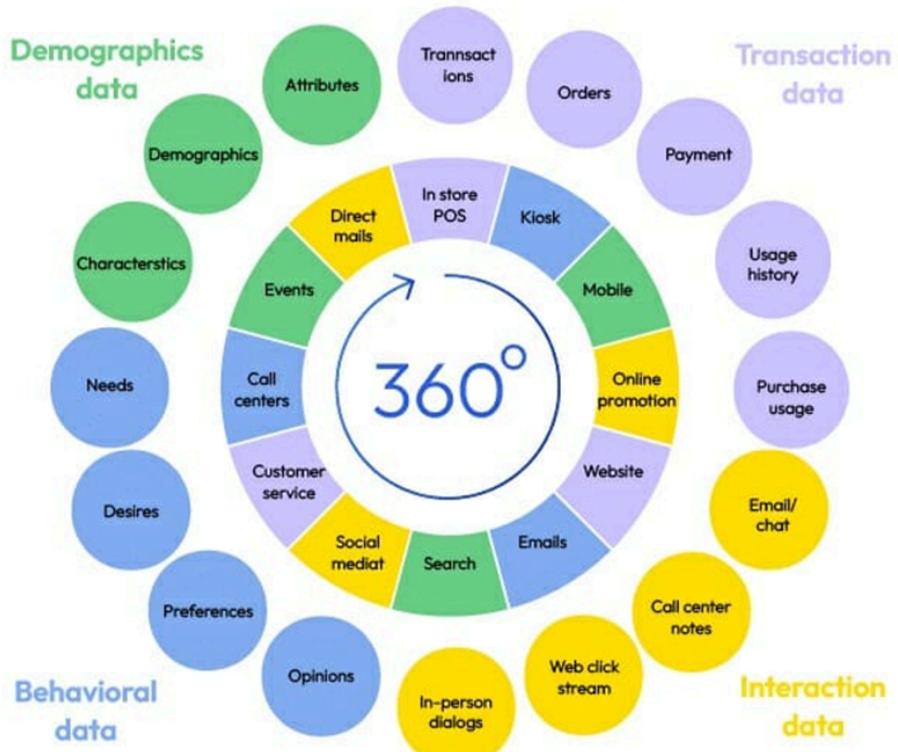
### **Customer 360**

***Customer 360 (or 360-degree customer) is a framework that consolidates all existing customer insights from various tables and models within your data warehouse to create a single, unified, and actionable profile of each customer.***

**Customer 360** is a shared, single view of your customer across an organization. It includes not only who the customer is but also their relationships (e.g., households or business affiliations), their activities (i.e., transactions and interactions) and inferred attributes (e.g., sentiment, anniversary dates and lifecycle stages).

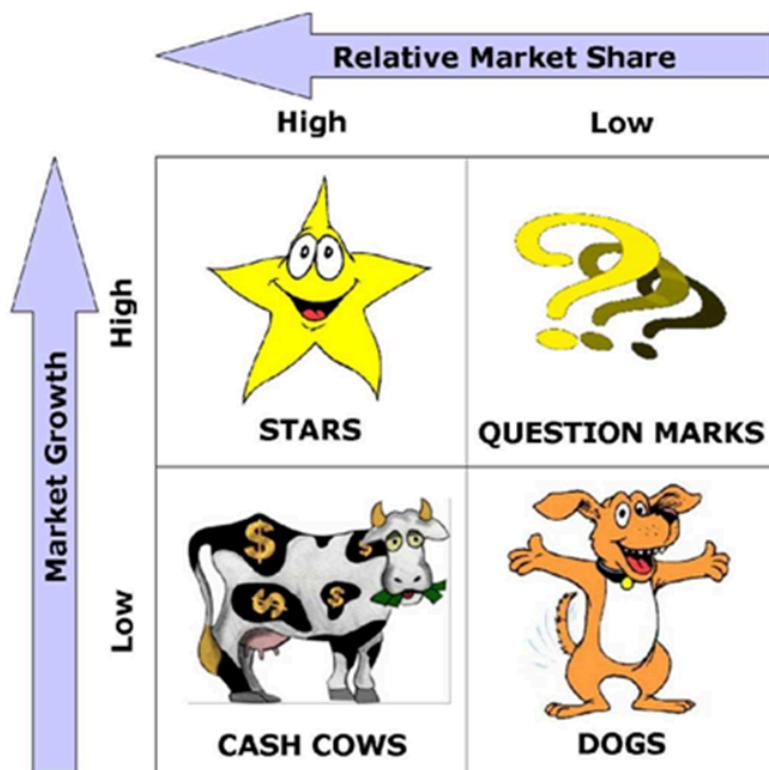
The ultimate goal of customer 360 is to eliminate fragmented and siloed data and create a single customer data hub so you can build personalized customer experiences and optimize business processes.

*360-degree customer rotates around 4 key fields: demographic, transaction, behavioral, and interaction data as below:*



## BCG Matrix

- BCG Matrix (or Boston Consulting Group Matrix), is a strategic management tool that helps companies analyze their product portfolios or customer segmentation.
- The matrix categorizes a company's products or services into four categories: Stars, Cash Cows, Question Marks, and Dogs. Each category represents a different level of market share and growth potential.
- Businesses can use the BCG Matrix to make strategic product portfolio decisions or marketing campaigns. It can help them allocate resources, prioritize investment, and decide which segment to invest in and which to divest.

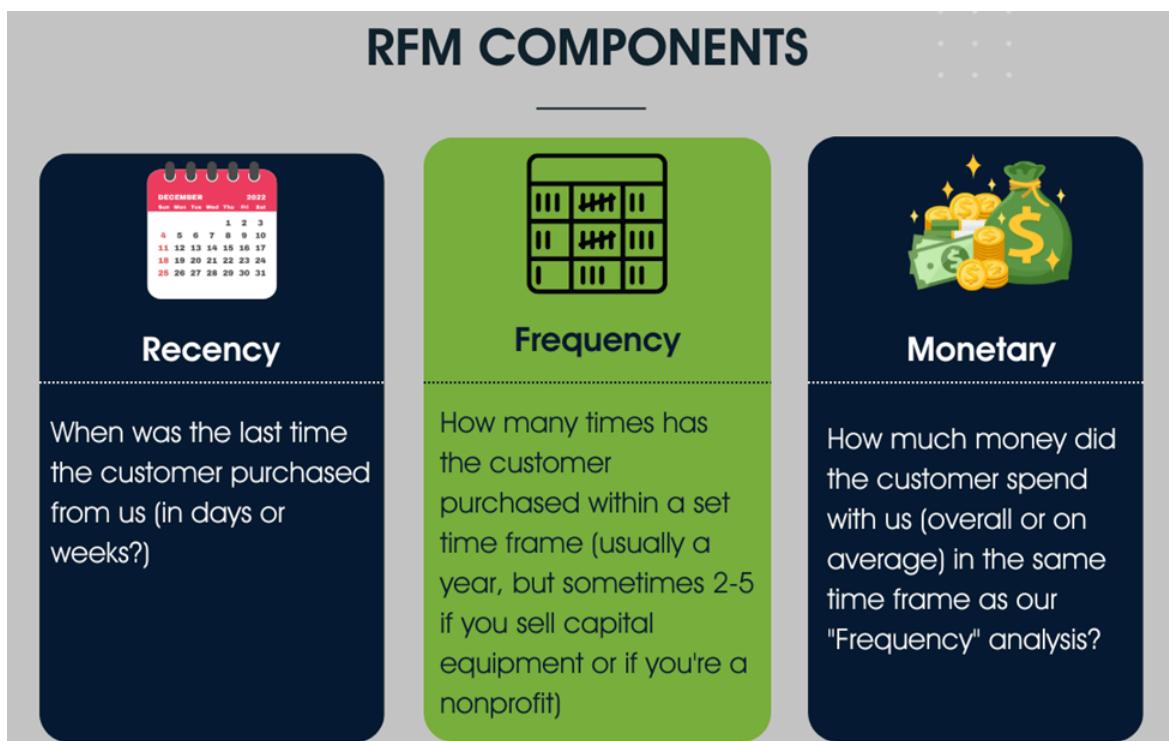


## RFM Model

RFM is a model applied for analysing transaction data from Customer 360. It enables transforming transaction data into analytical data for multiple purposes.

An RFM analysis evaluates clients and customers by scoring them in three categories:

1. **Recency**: How recently a customer has made a purchase
2. **Frequency**: How often a customer makes a purchase
3. **Monetary value**: How much money a customer spends on purchases

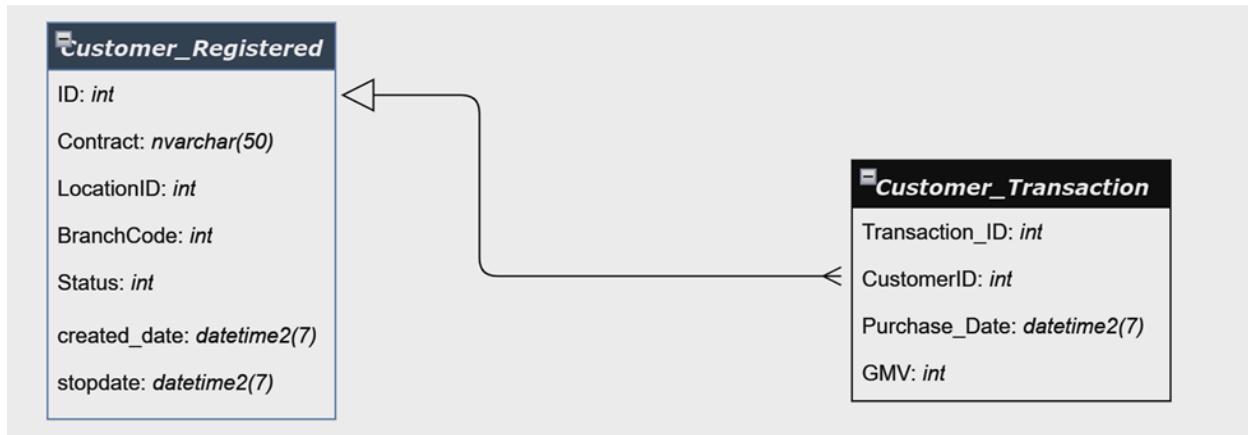


RFM analysis numerically ranks a customer in each of these three categories, generally on a scale of 1 to 4 (the higher the number, the better the result). The “best” customer would receive a top score in every category.

Then, RFM is used to identify a company’s or an organization’s best customers by measuring and analyzing spending habits to improve low-scoring customers and maintain high-scoring ones.

## III. Methodology

### *Data*



The ***Customer\_Registered*** table includes information about customers(ID, created\_date,...)

The ***Customer\_Transaction*** table includes information about customer transactions from June 1, 2022 to August 31, 2022

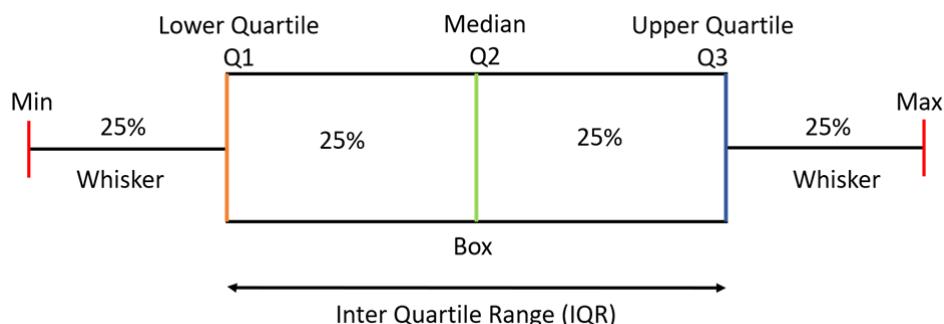
### *Implementation Process*

- Connect Python with SQL Server using pyodbc to get data from Database
- Query data from tables and compute Recency, Frequency, Monetary.
- Use Python and some specialized packages such as Numpy, Pandas, Itertools,... to compute and analyze data, generate “RFM” and “Segment” columns.
- Use Matplotlib and Seaborn to plot some charts for visualization.
- Then create a dashboard using Power BI tool.

### *Quartiles*

Quartiles are a kind of quantile that divides the number of data points into four parts, or quarters.

- The **first quartile (Q1)** , is defined as the middle number between the smallest number and the median of the data set,
- The **second quartile (Q2)** is the [median](#) of the given data set.
- The **third quartile (Q3)** is the middle number between the median and the largest value of the data set.



I propose a grading scale for R, F, and M based on the quartiles method. R, F, and M indicators are computed up to the report date (1/9/2022).

To ensure fairness and accuracy, the F and M indicators, which are calculated over a specific time frame, are divided by the customer's contract duration (from created\_date to 1/9/2022).

Then, RFM model assigns a score of 1 to 4 (from worst to best) for customers in each of the three categories.

scale	R	F	M
1	$\geq 92$	$< 0.19$	$< 15625$
2	$62 - < 92$	$0.19 - < 0.23$	$15625 - < 19175$
3	$31 - < 62$	$0.23 - < 0.26$	$19175 - < 23832$
4	$< 31$	$\geq 0.26$	$\geq 23832$

**Now, I classify customers into 4 different segments based on their R, F, M scores and the BCG Matrix, where each segment corresponds to one of the quadrants: Stars, Question Marks, Cash Cows, and Dogs.**

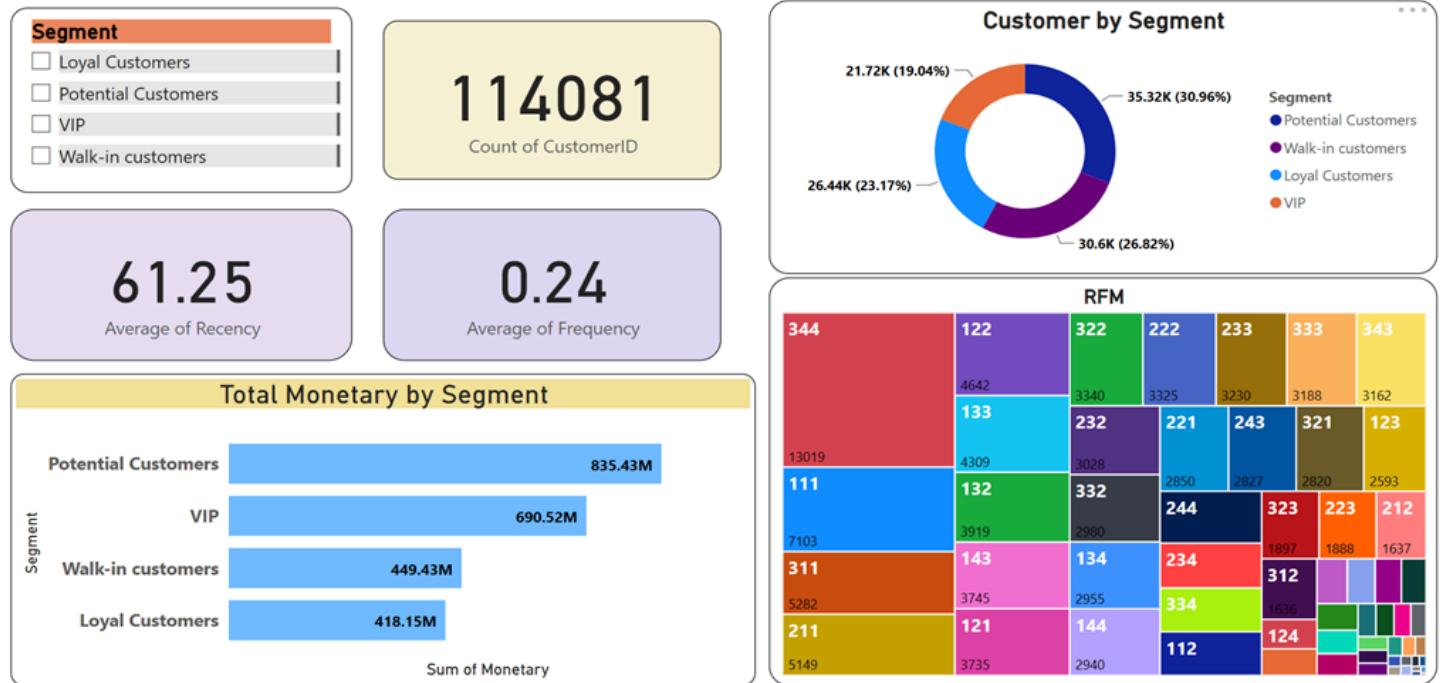
- **Stars:** High Recency, High Frequency, High Monetary Value.
- **Question Marks:** Low Recency and Frequency, High Monetary Value.
- **Cash Cows:** High Recency and Frequency, Low Monetary Value.
- **Dogs:** Low Recency, Low Frequency, Low Monetary Value.

BCG Elements	Segment	RFM
Stars	VIP	333, 334, 343, 344, 433, 434, 443, 444
Question Marks	Potential Customers	113 114 123 124 133 134 143 144 213 214 223 224 233 234 243 244 313 314 323 324 413 414 423 424
Cash Cows	Loyal Customers	131 132 141 142 231 232 241 242 311 312 321 322 331 332 341 342 411 412 421 422 431 432 441 442
Dogs	Walk-in customers	111, 112, 121, 122, 211, 212, 221, 222

## IV. Results

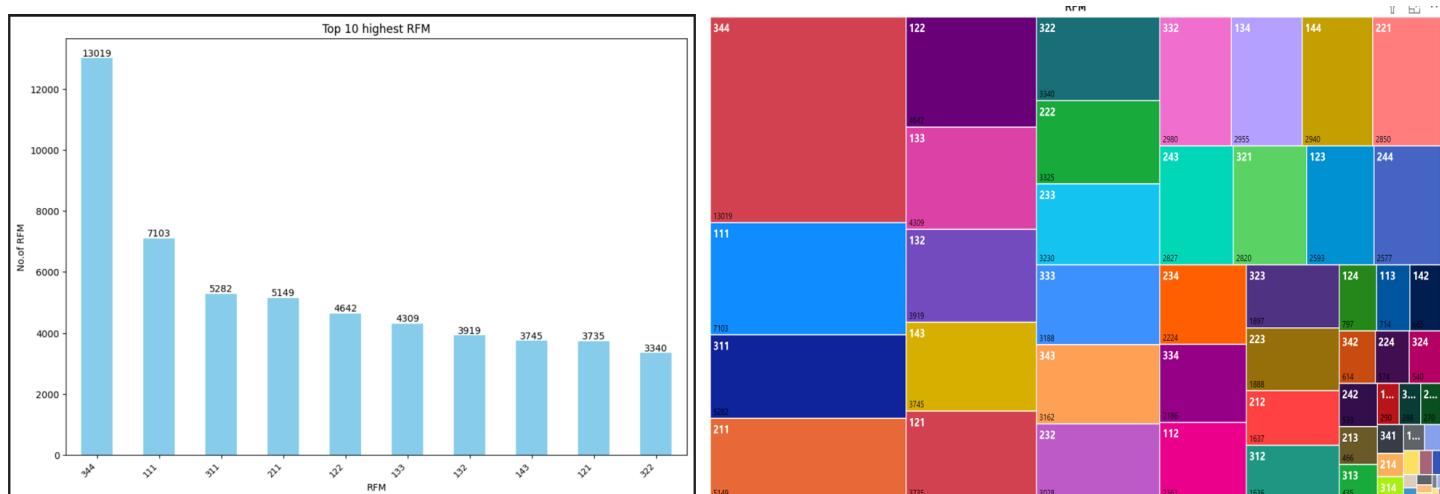
### Dashboard

# CUSTOMER SEGMENTATION



This is the overall picture about analysing report. Let's break down and analyze this.

## RFM distribution

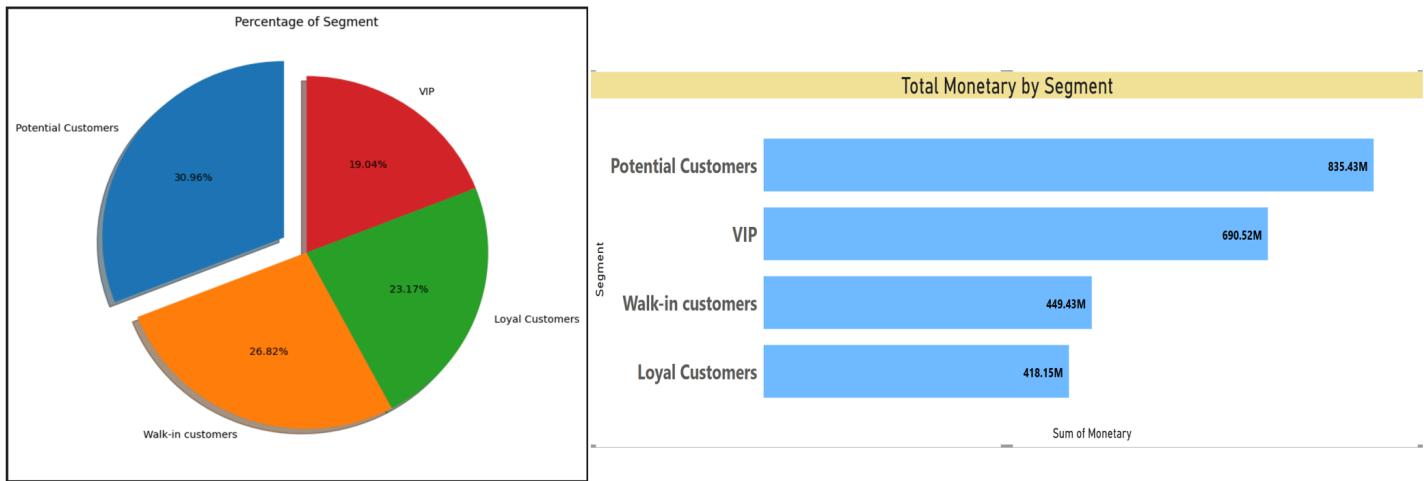


This bar chart visualizes the top 10 highest RFM (Recency, Frequency, Monetary) scores based on the number of occurrences.

- The RFM score of 344 (VIP) has the highest occurrence, with a count of 13,019. This indicates that a significant portion of the customer base falls into the VIP segment.
- The RFM score of 111 (Walk-in customers) has the second-highest occurrence, with a count of 7,103. Customers with an RFM score of 111 are likely new or infrequent purchasers with low spending. **This suggests a need to convert these customers into more frequent buyers.**
- The remaining RFM scores (311, 211, 122, 133, 132, 143, 121, 322) have counts ranging from 5,282 to 3,340.

These RFM scores represent a mix of customer behaviors, from low to high recency, frequency and monetary values. The Treemap indicates a diverse customer base with different levels of engagement and spending.

## *Customer Segmentation and Contribution*



This pie chart represents the percentage distribution of different customer segments: VIP, Loyal Customers, Walk-in Customers, and Potential Customers. And corresponds to the Monetary contribution on the bar chart.

**Potential Customers (30.96%)**: are the largest segment and the biggest revenue contributors, highlighting a critical opportunity for growth and conversion.

**Walk-in Customers (26.82%)**: take a significant portion and contribute notably to revenue, indicating the importance of converting them into repeat buyers.

**Loyal Customers (23.17%)** provide consistent revenue through repeat purchases, and strategies should aim to increase their spending.

**VIP Customers (19.04%)** though the smallest group, contribute significantly to revenue, underscoring the importance of maintaining their loyalty.

VIP	Potential Customers	Loyal Customers	Walk-in Customers
<ul style="list-style-type: none"> <li>● Portion: 19.04%</li> <li>● These are high-value customers who make frequent and/or high-value purchases and have a strong, ongoing relationship with the brand.</li> </ul>	<ul style="list-style-type: none"> <li>● Portion: 30.96%</li> <li>● These customers have shown interest or have potential to become active customers. They are properly high-value customer, but may not yet be fully loyal.</li> </ul>	<ul style="list-style-type: none"> <li>● Portion: 23.17%</li> <li>● These customers regularly purchase from the store and have a strong relationship with the brand. However, their monetary is not significant enough.</li> </ul>	<ul style="list-style-type: none"> <li>● Portion: 26.82%</li> <li>● These customers visit the store occasionally and might make spontaneous or occasional purchases.</li> </ul>

## Strategies

Maintain and enhance engagement with VIP customers by providing VIP-exclusive services, early access to new products, and premium support.	Focus on converting these potential customers into active, purchasing customers (VIP) through targeted marketing efforts, personalized offers, and engagement campaigns.	Maintain their loyalty by offering personalized rewards, exclusive offers, and recognizing their value through special events or loyalty programs. Continuously gather feedback to ensure their needs and expectations are met.	Enhance in-store experience, offer incentives for repeat visits, and capture their contact information for follow-up marketing efforts.
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By focusing on these strategies, the business can effectively leverage its customer segments to drive growth and enhance overall customer satisfaction.

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