Data Analysis Report

Customer 360

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INTRODUCTION

RFM, also known as **RFM analysis**, is a type of customer segmentation and behavioral targeting used to help businesses rank and segment customers based on the recency, frequency, and monetary value of a transaction

In an era of rapidly advancing technology, tracking and collecting information from various sources and analyzing the potential aspects of customers will help businesses easily reach their target audience. This allows businesses to make well-informed decisions and devise the most effective development strategies.

Therefore, to accurately determine customer needs, businesses must analyze the available data to make the most informed decisions. This is where Customer 360 analysis comes into play. But what exactly is Customer 360 analysis? Customer 360 is simply understood as a system that analyzes all customer information through various aspects. This system allows businesses to have the most detailed view of all the touchpoints where customers interact with them, such as purchase frequency, lifetime value, and more.

If businesses are always present at these touchpoints on the customer journey and quickly collect information to continuously update the Customer 360 portrait, understanding customers and meeting their needs and desires will no longer be a difficult task.

In this analysis, we will focus on Customer Clustering with the RFM Model. Specifically, the RFM Model is one of the models used to analyze customers based on three metrics, with scores evaluated on a scale from 1 to 4, where 1 is the lowest and 4 is the highest.

- **R (Recency)**: The last time the customer used the service
- **F (Frequency)**: The frequency with which the customer uses the service
- **M (Monetary)**: The revenue generated from the service

CHAPTER I

OVERVIEW OF RFM CUSTOMER 360

01 Introducing Customer 360

Customer 360 provides a comprehensive view of customer data by aggregating all information about a customer. It includes not only demographic information but also their relationships, activities, and lifecycle stages with the business.

With the aggregated data, businesses can build complete customer profiles. This helps them gain a holistic view of how their operations impact the customer experience.

All data is stored and shared with company members on a single platform. This allows businesses to create new strategies to attract customers and provide them with the best possible service experiences.

02 Benefit Of Customer 360 Analysis

Customer 360 helps businesses understand their customers, enabling them to provide superior customer experiences and ensure their own competitive advantage. With Customer 360, businesses can:

01

Gain a comprehensive view of customers

The shared Customer 360 view allows departments within the business to easily access customer information. This facilitates the creation of perfect business strategies that ensure trustworthy relationships with customers.

02

Understand customers and their behaviors

With Customer 360, businesses will have basic information, behaviors, and shopping habits of customers. This enhances customer retention and loyalty by connecting data about their activities and making more informed decisions to meet customer needs. At the same time, it allows businesses to quickly predict new opportunities.

03

Enhance the brand through customer data

From a unified view of customers, including purchase history, preferences, and even dissatisfaction, businesses can adjust to better suit similar customer segments. This helps enhance the brand image in the eyes of customers.

04

Create better sales and marketing programs

Based on customer information, sales and marketing departments can develop promotional programs that improve customer retention and loyalty.

05

Streamline business operations

Automate workflows so that data can be accessed from the start to support customer onboarding, self-scheduling, and other activities related to customers and the business.

03 Fundametal Concepts In RFM Customer 360 Analysis

RFM Customer 360 is a customer analysis method based on the RFM (Recency – Frequency – Money) model.

This method helps businesses evaluate the value of each customer based on their level of interaction with the business. From there, businesses can set strategic business efficiency and prioritize maximum profits. Specifically, the three main factors in RFM analysis are as follows:

Recency

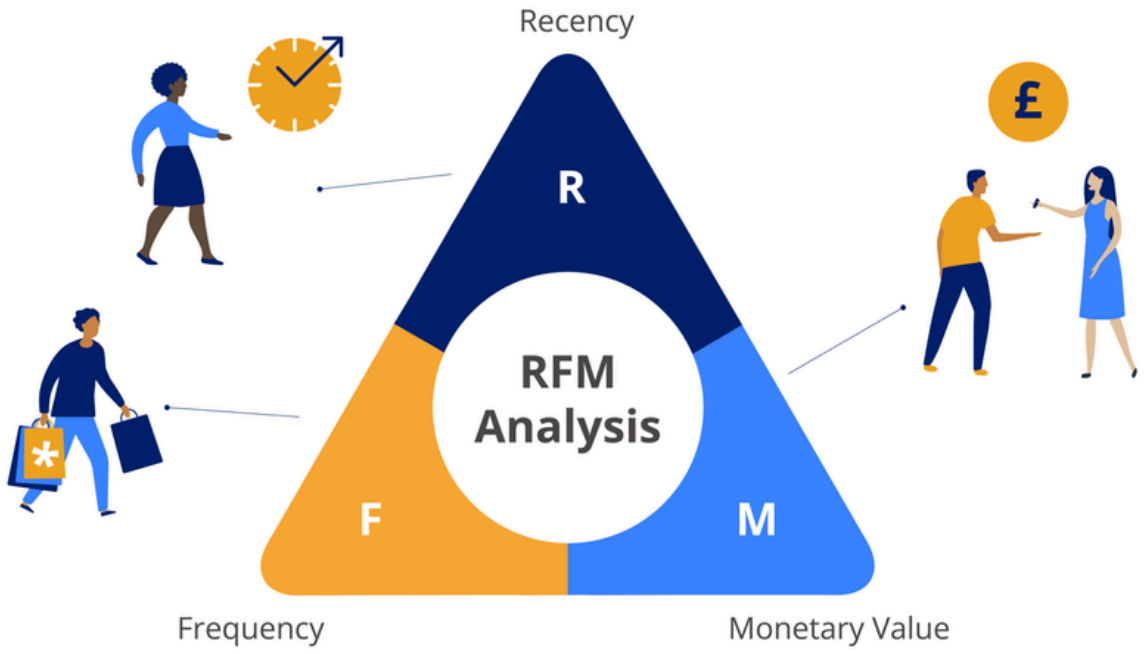
The time since the customer's last purchase.

Frequency

The number of times the customer has made purchases within a certain period.

Monetary

The total amount of money spent by the customer.



04 Benefit Of RFM Customer 360 Analysis

When implementing RFM analysis, businesses can derive numerous benefits. Specifically:

Enhanced customer segmentation

This approach allows businesses to access more customer data, enabling segmentation and adjustment of marketing programs based on each group's behavior and preferences.

Better understanding of customers

Through RFM, businesses gain insights into recent trends among customers, understanding their preferences, habits, and allowing for tailored marketing strategies for specific segments.

Identification of loyal & high-risk customers

Firstly, Identifying loyal customers allows businesses to allocate time and resources more effectively; Secondly, recognizing high-risk customers enables businesses to devise strategies to retain them rather than losing them.

Improved customer retention

By accurately identifying target customers, businesses can offer tailored incentives based on their habits and preferences, thereby increasing customer spending and fostering loyalty.

Enhanced profitability

Utilizing RFM analysis enables businesses to maximize resources towards appropriate customer segments, leading to significant improvements in revenue and profitability.

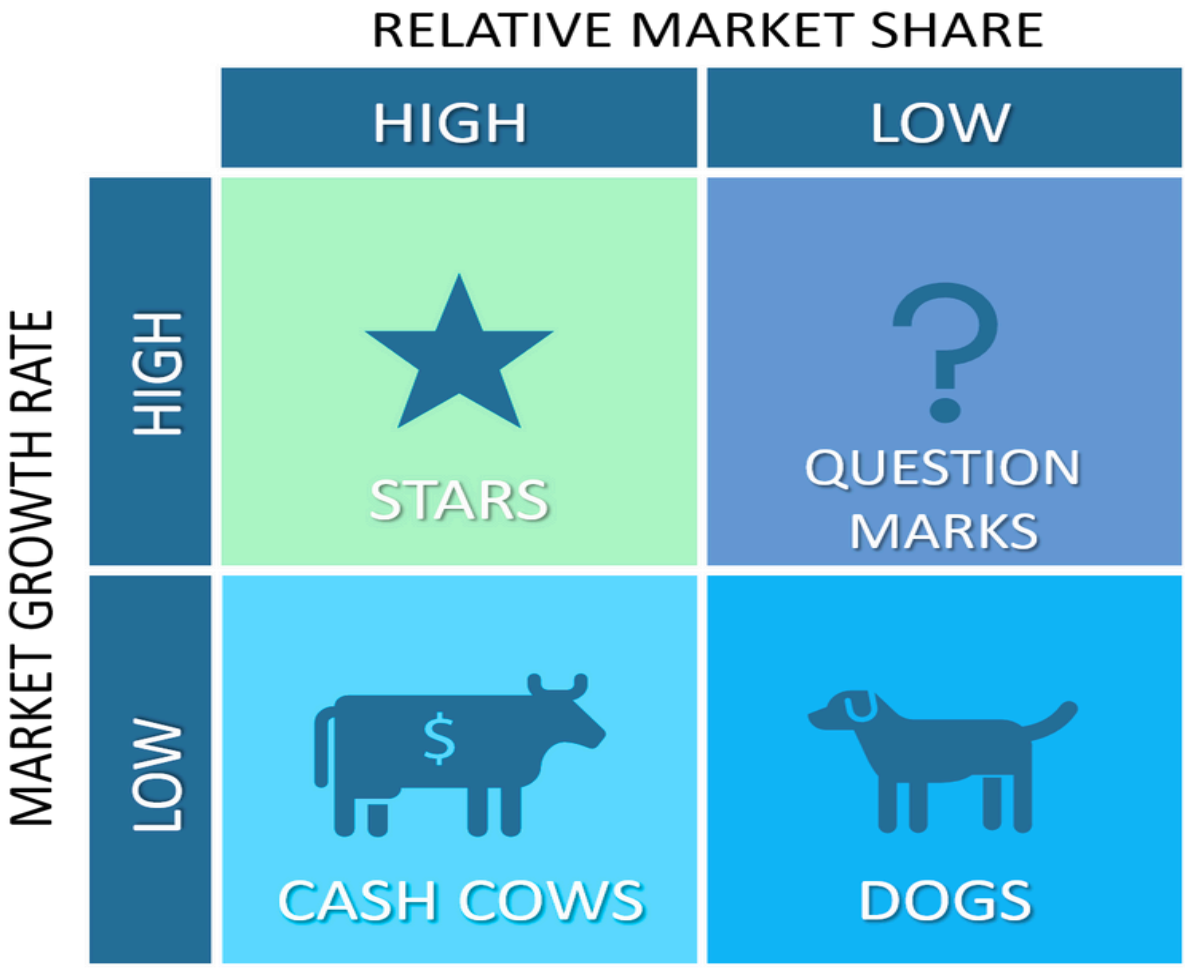
Time and cost savings

RFM analysis allows businesses to identify and focus on customer segments that warrant the investment of time and resources efficiently.

> These benefits underscore the strategic importance of RFM analysis in **enhancing customer relationships and optimizing business outcomes.**

05 Customer Definition by BCG Matrix

The BCG matrix (also known as the Boston matrix) is a strategic business analysis tool used to evaluate the growth rate and market share of products or product lines. Based on this evaluation, businesses can make decisions to retain, divest, invest more, or eliminate products.



The BCG matrix categorizes products into four SBU (Strategic Business Unit) statuses:

- **Star (VIP Customers):** This group of customers generates the main profit for the business, with frequent usage and recent service use close to the current time.
- **Cash Cow (General Customers):** This group has relatively low spending and purchase frequency, but they use the service regularly and have made recent purchases.
- **Question Mark (Potential Customers):** This group consists of customers who make frequent purchases and spend a lot, and their last use of the service was recent, but their usage frequency is not high.
- **Dog (Secondary Customers):** This group has low spending and brings the least profit to the business, with infrequent service usage and the last use being relatively long ago.

CHAPTER II

DETERMINE CUSTOMER GROUPS

01 Data separation

Description of data sheets
In this project, we have two tables that need to be analyzed:

Customer_Transaction table

Column Name	#	Type	Length	Scale	Precision	Not Null	Identity	Default
123 ID	1	bigint	8		19	[ ]	[ ]	
RBC CustomerID	2	varchar	200			[ ]	[ ]	
Purchase_Date	3	datetime	8	3	23	[ ]	[ ]	
123 GMV	4	bigint	8		19	[ ]	[ ]	

Customer_Transaction Table: Shows customer information from June 2022 to August 2022. Each row on the table is each transaction task. The Customer_Transaction table has 4 columns of data. Each transaction will be identified by [ID]. Each transaction records information: Which Customer [CustomerID], purchase date [Purchase_Date], how much money [GMV].

Customer_Registered table

Column Name	#	Type	Length	Scale	Precision	Not Null	Identity	Default
123 ID	1	bigint	8		19	[ ]	[ ]	
RBC Contract	2	varchar	100			[ ]	[ ]	
123 LocationID	3	int	4		10	[ ]	[ ]	
123 BranchCode	4	tinyint	1		3	[ ]	[ ]	
123 Status	5	tinyint	1		3	[ ]	[ ]	
created_date	6	datetime	8	3	23	[ ]	[ ]	
stopdate	7	datetime	8	3	23	[ ]	[ ]	

Customer_Registered Table: Display the profiles of customers who have registered for membership cards. In this case, we will use the information from the Customer_Registered table to calculate the contract age of the customer, then divide it by FREQUENCY and MONETARY values to ensure a fair comparison among customers within the same time frame. Finally, we can effectively compare the performance between different customer groups.

02 Build RFM SCORE scoring framework and classification in SQL

Tool: MS SQL (Score Code)
How to do:

- Process OTLP data to OLAP from Customer_Transaction table
- Join two tables Customer_Transaction and Customer_Registered to get information.
- To process we will use functions: CASE WHEN, DATEDIFF, WINDOWS FUNCTIONS

Step 1: Calculation of value: Recency, Frequency, Monetary

Recency

Length of time since the customer's last purchase (Use reporting date September 1, 2022)

Frequency

Total number of days a customer purchase/lifetime

Monetary

Total revenue from customers

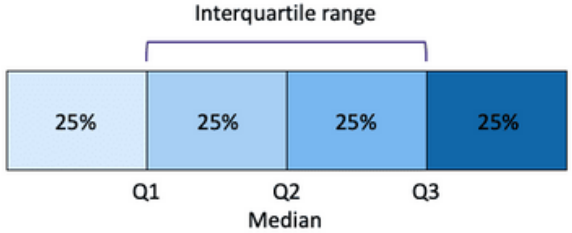
	CustomerID	Recency	Frequency	Monetary
1	167518	13	0.14	0
2	184355	20	0.14	0
3	75284	31	0.14	0
4	180274	31	0.14	0
5	180255	31	0.14	0
6	142118	39	0.14	0
7	170846	46	0.14	0
8	180314	62	0.14	0
9	180279	62	0.14	0
10	125201	92	0.14	0
11	180263	92	0.14	0
12	156041	92	0.14	0
13	178884	67	0.14	0
14	298720	67	0.17	0
15	337434	76	0.17	0
16	281215	80	0.17	0
17	214067	62	0.17	0
18	232722	62	0.17	0
19	191389	62	0.17	0

Customer_Transaction table after being processed

Step 2: Score RFM according to IQR in SQL

Divide the R – F – M data into 4 equal parts (quartiles) labeled from 1 to 4. In this case, we convention that the larger the label, the better the value (Label = 4 is best).

Example: For recency, the higher its value, the worse it is, indicating that customers have not come back to buy for a long time.



CustomerID	Recency	Frequency	Monetary	R	F	M
167518	13	0.14	0	4	1	1
184355	20	0.14	0	4	1	1
75284	31	0.14	0	3	1	1
180274	31	0.14	0	3	1	1
180255	31	0.14	0	3	1	1
142118	39	0.14	0	3	1	1
170846	46	0.14	0	3	1	1
180314	62	0.14	0	2	1	1
180279	62	0.14	0	2	1	1
125201	92	0.14	0	1	1	1
180263	92	0.14	0	1	1	1
156041	92	0.14	0	1	1	1
178884	67	0.14	0	2	1	1
298720	67	0.17	0	2	1	1
337434	76	0.17	0	2	1	1
281215	80	0.17	0	2	1	1
214067	62	0.17	0	2	1	1
232722	62	0.17	0	2	1	1
191389	62	0.17	0	2	1	1
189954	62	0.17	0	2	1	1
188064	62	0.17	0	2	1	1
284476	62	0.17	0	2	1	1
282131	62	0.17	0	2	1	1
259836	62	0.17	0	2	1	1
255416	62	0.17	0	2	1	1
335876	62	0.17	0	2	1	1
321795	62	0.17	0	2	1	1

Result after calculating RFM according to IQR

Step 2: Score RFM according to IQR in SQL

We will categorize customers using the standard classification method into seven different groups, including:

- Superiors Loyalists
- Potential Loyalists
- Responsive
- Promising
- Hibernating Loyalists
- Need Attention
- About to Sleep
- At Risk

	RFM_Segment
1	About to Sleep
2	At Risk
3	Hibernating Loyalists
4	Need Attention
5	Potential Loyalists
6	Promising
7	Responsive
8	Superriors Loyalists

Customer grouping

Step 2: Score RFM according to IQR in SQL

Customer segmentation	RFM score groups	Characteristics
Superiors Loyalists	344, 443, 444, 343,	They are superior loyal customers with the ability to engage positively, have high purchase frequency, and generate significant revenue for the business.
Potential Loyalists	442, 441, 342, 341,	They are potential customers with a relatively high purchase frequency and stable spending on the company's products or services.
Responsive	313, 423, 424, 324, 414, 323, 314	They are customers who, despite having a low purchase frequency, generate significant revenue for the business. They are easily attracted by offers and promotions.
Promising	412, 411, 421, 312, 321, 311, 422, 322	These are the ones with the most recent last purchase. However, the frequency and revenue they bring to the business are not high, but they have the potential to grow.
Hibernating Loyalists	244, 144, 143, 243	Formerly active customers who have slowed down in engagement. Targeted re-engagement efforts, such as exclusive discounts or “We miss you” campaigns, may bring them back to higher engagement.
Need Attention	223, 123,114, 213, 224, 113, 214, 124	Customers who have low engagement and moderate revenue. They need more attention to keep them from drifting away.
About to Sleep	241, 141, 242, 142,	These are people who used to be very frequent buyers. However, they seem to be dropping off recently and revenue from this customer base is down. A strategy is needed to retain them.
At Risk	122, 212, 121, 211, 221, 222, 111, 112,	These are the customers who have low engagement rates, low purchase frequency, and low revenue for the business. It is important to understand why in order to effectively adjust the strategy.

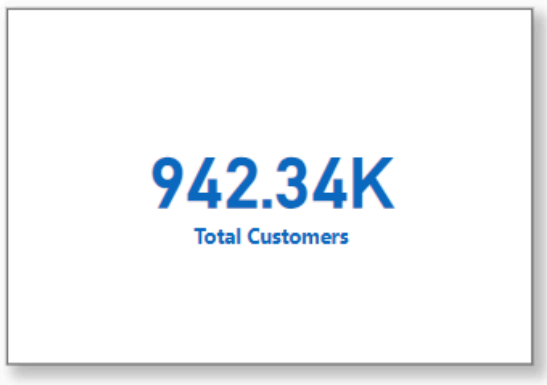
CHAPTER III

CUSTOMER ANALYSIS

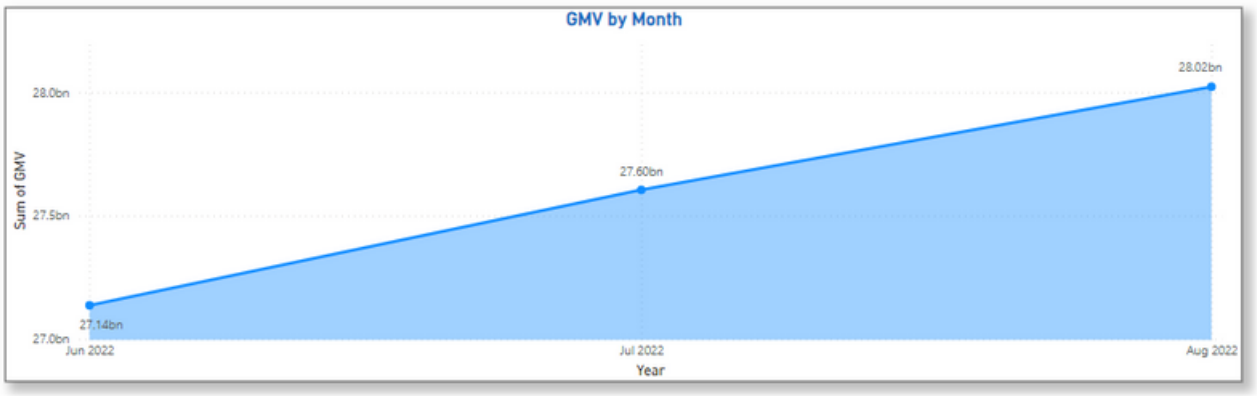
01 Overview of customer

Using **Power BI**

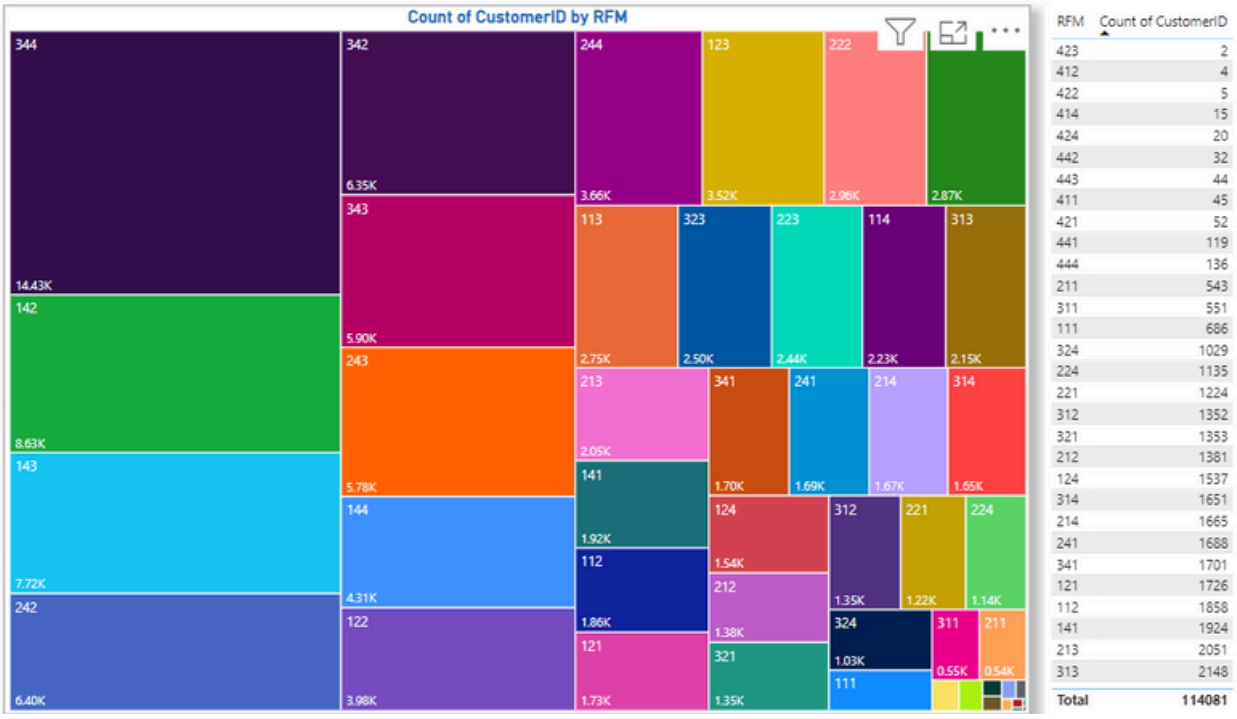
Currently, the database records show that more than 942,000 customers are using the service. Additionally, the revenue generated by these customers has reached 83 million VND.



Additionally, the growth rate has shown significant improvement month over month. However, to maximize profitability for the business, we need to identify and analyze customer segments to understand which ones are the most promising.



Next, let's take an overview of the customer situation by different groups according to the chart below:



RFM	Count of CustomerID
423	2
412	4
422	5
414	15
424	20
442	32
443	44
411	45
421	52
441	119
444	136
211	543
311	551
111	686
324	1029
224	1135
221	1224
312	1352
321	1353
212	1381
124	1537
314	1651
214	1665
241	1688
341	1701
121	1726
112	1858
141	1924
213	2051
313	2148
Total	114081

Looking at the overview chart of customer statistics, we can see the distribution among different customer groups. Group 344 has the highest number of customers. Following that are groups 142, 143, and 242 with a relatively large number of customers ranging from 8.600 to 6.400.

On the other hand, there are groups with very few customers, such as 423, 412, 422 each having only 2, 4, and 5 customers respectively.

>> From this, we can see that customers with a high percentage are usually those with a very **high purchase frequency** and a relatively **recent last service use**. The revenue the company can obtain from this customer group is relatively high.

>> Conversely, customer groups with a low percentage have a relatively low purchase frequency, a high proportion of recent last purchases, and typically do not generate substantial revenue for the company.

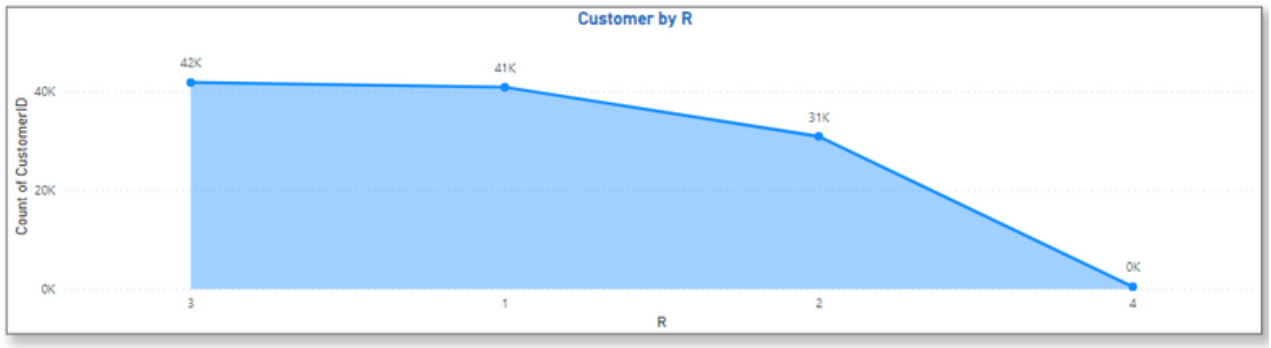
02 Analyze customers from different aspects

Using **Power BI**

To evaluate the customer groups in more detail, let's analyze each aspect of R, F, and M as follows:

From the RFM Model, we have over 60 different customer groups analyzed based on three aspects:

- How frequently do customers use the service?
- When was the last time customers used the service or made a purchase?
- How much money do customers spend on the company's products?



The chart shows the number of customers using the service and their most recent purchase

42K

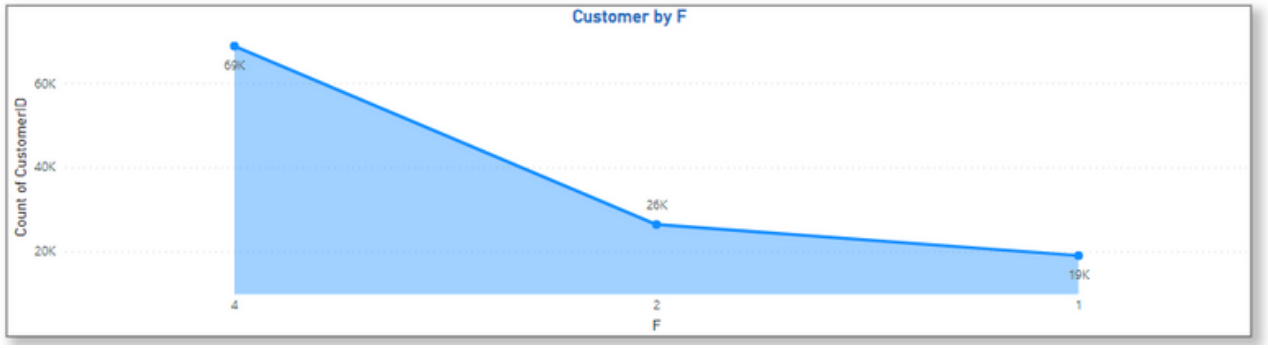
Customers
3rd group

41K

Customers
1st group

Based on the chart, we can see that the group with the highest number of customers making recent purchases is the fourth group, which is the lowest, while the majority belong to the first and third groups with 41.000 and 42.000 people respectively. This indicates that customers do not frequently use the service here.

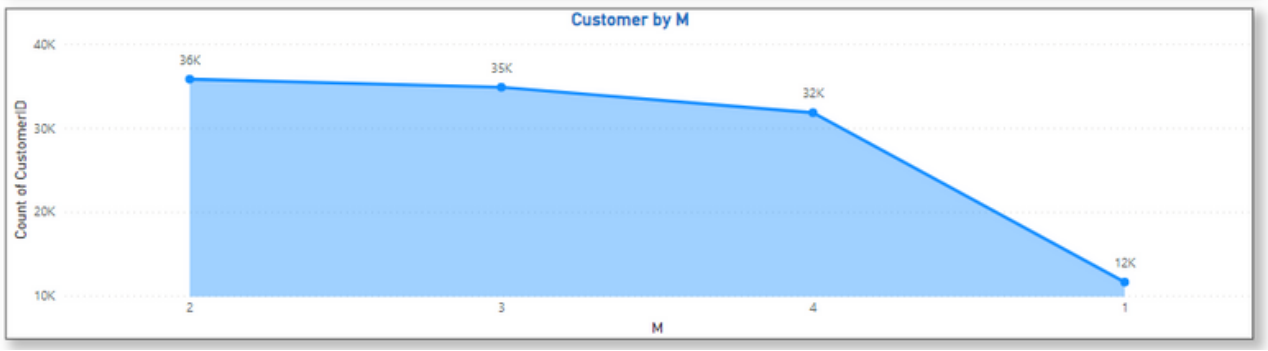
>> The business needs to **improve the quality of its products and services** to better meet customer needs and desires. In doing so, customers will be more likely to remember the company's brand when making their choices.



The chart shows the purchase frequency of 4 customer groups

Based on the data from the chart showing customer purchase frequency, we see that the group with a high purchase frequency account for a significant number, reaching 69,000 customers. Meanwhile, customers with a low purchase frequency also represent a notable amount, reaching 19,000 people.

>> Therefore, the business needs **specific strategies** to effectively increase the purchase frequency of the remaining small number of customers.



The chart shows the customers who spend the most money on the company's products

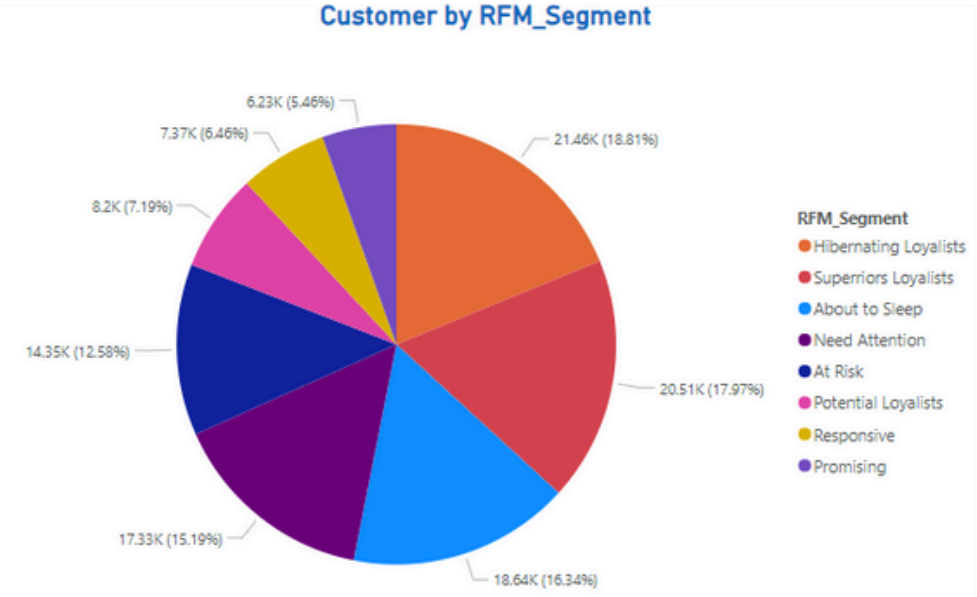
Based on this chart, we can easily see that the number of customers who spend a significant amount of money, contributing major revenue to the business, is not very high (Group 4), only accounting for 32.000 customers. There are still not many customers interested in using the company's products and services, as evidenced by Group 1 with 12.000 customers and Group 2 with up to 36.000 people.

>> Therefore, the business needs to **launch more campaigns and promotional programs** to encourage customers to use the products more and spend more money with the company.

03 Evaluation based on customer segments

Using **Power BI**

Specifically, we will now explore the meaning of the four groups according to the BCG Matrix - the Growth-Share Matrix.



Star (VIP Customers)

The VIP group in the BCG Matrix here refers to the Superiors Loyalists. They have a high purchase frequency, a very recent purchase, and are particularly generous in spending money with the company. Currently, this customer group comprises over 20.000 people (17.97%) and ranks at the top compared to other groups.

Question Mark (Potential Customers)

The Question Mark group in the BCG Matrix here includes customer groups such as: Potential Loyalists, Responsive, Hibernating Loyalists, and Need Attention. These groups typically score high in one of the three factors: purchase frequency, revenue, or recent purchases. Currently, this customer group holds a significant market share compared (48.37%) to the others, specifically:

- Potential Loyalists: 8.200 people (7,19%)
- Responsive: 7.370 people (6,46%)
- Hibernating Loyalists: 21.460 people (18.81%)
- Need Attention: 17.330 people (15,19%)

Cash Cow (General Customers)

The Cash Cow group in the BCG Matrix here refers to the Promising. This customer group, although they have a very high recent purchase frequency, only has an average to low level of purchase frequency and spending with the company. Currently, compared to the other groups, this is also the group with the lowest percentage, with only 6,230 people (5.46%). Therefore, the business needs to implement more policies to increase revenue from this group and retain them as loyal customers.

Dog (Secondary Customers)

The Question Mark group in the BCG Matrix here includes customer groups such as: About Sleep, At Rick. These are two customer groups with low purchase frequency, almost no recent purchases, and extremely low revenue from these customers. However, they currently represent a relatively significant proportion of the company's customer base. Specifically:

- About Sleep: 18.640 people (16.34%)
- At Risk: 14.350 people (12.58%)

Therefore, if the business does not quickly implement improvement measures, it is certain that in the near future, the company will face significant setbacks in the market. Implement more customer-friendly policies to retain these customers and increase revenue from them

CHAPTER IV

SOLUTIONS FOR BUSINESSES

Currently, the database records show that more than 942,000 customers are using the service. Additionally, the revenue generated by these customers has reached 83 million VND.

FOR LOYAL CUSTOMERS (CASH COWS)

The business should implement strategies such as creating more promotional programs (buy one get one free, lucky draw prizes,...) or offering discounts to maximize purchase frequency and spending from these customers. This can help move the Cash Cow customers to the Star group.

FOR SECONDARY CUSTOMERS (DOGS)

The business needs strategies that leave a lasting impression on these customers: flash sales, discounts on subsequent purchases, buy one get one free programs,... to encourage movement from the Dog group to the Cash Cow group.

FOR VIP CUSTOMERS (STARS)

This group generates the largest revenue for the business, so special attention is required. Solutions include offering special promotions such as holiday or birthday vouchers, regularly surveying this group's satisfaction to understand their needs, and maintaining this customer base.

FOR POTENTIAL CUSTOMERS (QUESTION MARKS)

This group consists of customers with gradually increasing purchase frequency, though not yet high. To retain these customers, the business should launch programs such as: rewarding frequent purchases with points, offering free shipping on all orders, and improving product quality to ensure long-term loyalty.

CODE SQL REFERENCE

```
--Calculate Frequency, Recency, Monetary
SELECT
CustomerID ,
DATEDIFF(Day, MAX(cast(Purchase_date as DATE)), '2022-09-01') as 'Recency',
ROUND(COUNT(DISTINCT(Cast(Purchase_Date as DATE)))/
CAST(datediff(YEAR, MIN(Cast(created_date as DATE)), '2022-09-01') as Float), 2) as
'Frequency',
SUM(GMV) as 'Monetary',
ROW_NUMBER () OVER (
ORDER BY
DATEDIFF(DAY, MAX(Purchase_Date), '2022-09-01')) AS rn_R,
ROW_NUMBER () OVER (
ORDER BY
ROUND(COUNT(DISTINCT(Cast(Purchase_Date as DATE)))/
CAST(datediff(YEAR, MIN(Cast(created_date as DATE)), '2022-09-01') as Float), 2)) AS
rn_F,
ROW_NUMBER () OVER (
ORDER BY
SUM(GMV)) AS rn_M
INTO #Calc
FROM
Customer_Transaction ct
JOIN Customer_Registered cr ON
ct.CustomerID = cr.ID
WHERE
ct.CustomerID <> 0
GROUP BY
ct.CustomerID, cr.created_date
--Calculate RFM Point
SELECT
*,
Case
When Recency < (SELECT Recency FROM #Calc WHERE (rn_R = (SELECT
CAST(COUNT(DISTINCT(rn_R))*0.25 AS INT) FROM #Calc)))
AND Recency >= (SELECT Recency FROM #Calc WHERE rn_R = 1)
THEN '4'
When Recency >= (SELECT Recency From #Calc WHERE (rn_R = (SELECT
CAST(COUNT(DISTINCT(rn_R))*0.25 AS INT) FROM #Calc)))
AND Recency < (SELECT Recency From #Calc WHERE (rn_R = (SELECT
CAST(COUNT(DISTINCT(rn_R))*0.5 AS INT) FROM #Calc)))
THEN '3'
When Recency >= (SELECT Recency From #Calc WHERE (rn_R = (SELECT
CAST(COUNT(DISTINCT(rn_R))*0.5 AS INT) FROM #Calc)))
AND Recency < (SELECT Recency From #Calc WHERE (rn_R = (SELECT
CAST(COUNT(DISTINCT(rn_R))*0.75 AS INT) FROM #Calc)))
THEN '2'
ELSE '1' END AS R,
Case
When Frequency < (SELECT Frequency FROM #Calc WHERE (rn_F = (SELECT
CAST(COUNT(DISTINCT(rn_F))*0.25 AS INT) FROM #Calc)))
AND Frequency >= (SELECT Frequency FROM #Calc WHERE rn_F = 1)
THEN '1'
```

```
When Frequency >= (SELECT Frequency From #Calc WHERE (rn_F = (SELECT
CAST(COUNT(DISTINCT(rn_F))*0.25 AS INT) FROM #Calc)))
AND Frequency < (SELECT Frequency From #Calc WHERE (rn_F = (SELECT
CAST(COUNT(DISTINCT(rn_F))*0.5 AS INT) FROM #Calc)))
THEN '2'
When Frequency >= (SELECT Frequency From #Calc WHERE (rn_F = (SELECT
CAST(COUNT(DISTINCT(rn_F))*0.5 AS INT) FROM #Calc)))
AND Frequency < (SELECT Frequency From #Calc WHERE (rn_F = (SELECT
CAST(COUNT(DISTINCT(rn_F))*0.75 AS INT) FROM #Calc)))
THEN '3'
ELSE '4' END AS F,
Case
When Monetary < (SELECT Monetary FROM #Calc WHERE (rn_M = (SELECT
CAST(COUNT(DISTINCT(rn_M))*0.25 AS INT) FROM #Calc)))
AND Monetary >= (SELECT Monetary FROM #Calc WHERE rn_M = 1)
THEN '1'
When Monetary >= (SELECT Monetary From #Calc WHERE (rn_M = (SELECT
CAST(COUNT(DISTINCT(rn_M))*0.25 AS INT) FROM #Calc)))
AND Monetary < (SELECT Monetary From #Calc WHERE (rn_M = (SELECT
CAST(COUNT(DISTINCT(rn_M))*0.5 AS INT) FROM #Calc)))
THEN '2'
When Monetary >= (SELECT Monetary From #Calc WHERE (rn_M = (SELECT
CAST(COUNT(DISTINCT(rn_M))*0.5 AS INT) FROM #Calc)))
AND Monetary < (SELECT Monetary From #Calc WHERE (rn_M = (SELECT
CAST(COUNT(DISTINCT(rn_M))*0.75 AS INT) FROM #Calc)))
THEN '3'
ELSE '4' END AS M
INTO #RFM_Calc
FROM #Calc
SELECT CustomerID, Recency, Frequency, Monetary, R, F, M FROM #RFM_Calc
--Mapping Customer Groups
SELECT CONCAT(R,F,M) as "RFM",
CASE
WHEN (R >= 3 AND F >= 3 AND M >= 3) THEN 'Superriors Loyalists'
WHEN (R >= 3 AND F >= 3 AND M < 3) THEN 'Potential Loyalists'
WHEN (R >= 3 AND F < 3 AND M >= 3) THEN 'Responsive'
WHEN (R >= 3 AND F < 3 AND M < 3) THEN 'Promising'
WHEN (R < 3 AND F >= 3 AND M >= 3) THEN 'Hibernating Loyalists'
WHEN (R < 3 AND F < 3 AND M >= 3) THEN 'Need Attention'
WHEN (R < 3 AND F >= 3 AND M < 3) THEN 'About to Sleep'
ELSE 'At Risk'
END AS RFM_Segment, COUNT(*) as "Total_clients"
FROM #RFM_Calc
GROUP BY CONCAT(R,F,M), R, F, M

SELECT R, COUNT(*) as "Total_Clients"
FROM #RFM_calc
Group by R
SELECT F, COUNT(*) as "Total_Clients"
FROM #RFM_calc
Group by F
SELECT M, COUNT(*) as "Total_Clients"
FROM #RFM_calc
Group by M
```

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