**1. Outliner Analysis Approach for GMR on Bases of Documentation**

To identify customers whose spend and transaction behavior lies outside the normal thresholds set for specific time intervals (1, 7, 15, 30 days), based on average transaction value (ATV).

**Threshold Derivation Logic (Based on ATV and Scaling)**

The thresholds were derived using the following base calculation logic:

1. **Base ATV Calculation**

* A sample average ATV was calculated using observed data.
* ATV = 532.77
* For Day 1: ATV \* 3 = 532.77 \* 3 = 1598.3 → rounded to **1500** (initial threshold)
* Average transaction \* 3 = 1.1 \* 3 = 3.3 → rounded to **3**

1. **Bucket Expansion**

* After the base threshold (e.g., ₹1500 for Day 1 and 3 transaction), buckets were expanded using a step value of:

1. **Daily Scaling Logic**

* Multiply base spend and transaction values by the day count for other intervals:

|  |  |  |
| --- | --- | --- |
| Day Interval | Spend = ATV \* Days | Txn = Avg\_txn \* Days |
| Day 1 | 532.77 \* 3 ≈ 1500 | 1.1 \* 3 ≈ 3 |
| Day 7 | 532.77 \* 7 = 3729 | 1.1 \* 7 = 7.7 → 8 |
| Day 15 | 532.77 \* 15 = 7991 | 1.1 \* 15 = 16.5 → 16 |
| Day 30 | 532.77 \* 30 = 15983 | 1.1 \* 30 = 33 → 32 |

**Rounded Thresholds Used in Analysis:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1 day spend greater than or equal to** | **1500** | **2000** | **2500** | **3000** |
| **Customers count** | 4524 | 1827 | 878 | 507 |
| **1 day transcations greater than or equal to** | **3** | **4** | **5** | **6** |
| **Customers count** | 1010 | 241 | 88 | 47 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 5126 | 1957 | 907 | 519 |
| **7 days spend greater than or equal to** | **3700** | **4700** | **5700** | **6700** |
| **Customers count** | 308 | 171 | 127 | 105 |
| **7 days transcations greater than or equal to** | **8** | **10** | **12** | **14** |
| **Customers count** | 32 | 24 | 17 | 12 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 315 | 175 | 128 | 106 |
| **Column1** | **Column2** | **Column3** | **Column4** | **Column5** |
| **Customers count** | 85 | 60 | 48 | 35 |
| **15 days transcations greater than or equal to** | **16** | **20** | **24** | **28** |
| **Customers count** | 15 | 10 | 9 | 9 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 88 | 60 | 48 | 37 |
| **30 days spend greater than or equal to** | **16000** | **20000** | **24000** | **28000** |
| **Customers count** | 28 | 16 | 12 | 10 |
| **30 days transcations greater than or equal to** | **32** | **38** | **44** | **50** |
| **Customers count** | 9 | 8 | 8 | 6 |
|  |  |  |  |  |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 29 | 17 | 13 | 11 |
|  |  |  |  |  |
|  |  |  |  |  |
| **Combining all the above rules** | **Column2** | **Column3** | **Column4** | **Column5** |
| **Customers count** | 5127 | 1959 | 908 | 520 |
| **% of Customers count** | 3.94% | 1.50% | 0.70% | 0.40% |
|  |  |  |  |  |
| total customer base 23-dec-25 to 15-jul-25 | 130290 |  |  |  |

I've added a new section called **"Final Aggregated Analysis"** that explains how to compute:

* Total number of customers
* Outlier percentage breakdown
* A summary table to show the final segmentation

**2. Robust Outlier Cutting Using 80th Percentile Thresholds based on spend**

**Step-by-Step Calculation:**

* **Q1 (25th Percentile)** = 314.2
* **Q3 (75th Percentile)** = 666.8
* **Interquartile Range (IQR)** = Q3 - Q1 = 352.6
* **Lower Limit** = Q1 - 1.5 \* IQR = -214.7
* **Upper Limit** = Q3 + 1.5 \* IQR = 1195.6
* **80th Percentile of Spend** = **750.75**

**Derived Thresholds Based on 80th Percentile:**

Using 80th percentile (750.75) and average txn = 1.1, the daily thresholds are:

|  |  |  |  |
| --- | --- | --- | --- |
| Day Interval | Spend Threshold | Txn Threshold | (Before Rounding) |
| Day 1 | 750.75 \* 3 = 2252.25 | 1.1 \* 3 = 3.25 |  |
| Day 7 | 750.75 \* 7 = 6063.75 | 1.1 \* 7 = 7.7 |  |
| Day 15 | 750.75 \* 15 = 11261.25 | 1.1 \* 15 = 16.27 |  |
| Day 30 | 750.75 \* 30 = 22522.5 | 1.1 \* 30 = 32.54 |  |

**Rounded Thresholds Used in Analysis:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1 day spend greater than or equal to** | **2000** | **2500** | **3000** | **3500** |
| **Customers count** | 1827 | 878 | 507 | 341 |
| **1 day transcations greater than or equal to** | **3** | **4** | **5** | **6** |
| **Customers count** | 1010 | 241 | 88 | 47 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 2605 | 1040 | 543 | 357 |
| **7 days spend greater than or equal to** | **5000** | **6000** | **7000** | **8000** |
| **Customers count** | 157 | 118 | 100 | 82 |
| **7 days transcations greater than or equal to** | **8** | **10** | **12** | **14** |
| **Customers count** | 32 | 24 | 17 | 12 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 167 | 123 | 103 | 84 |
| **15 days spend greater than or equal to** | **10000** | **12000** | **14000** | **16000** |
| **Customers count** | 60 | 48 | 35 | 25 |
| **15 days transcations greater than or equal to** | **16** | **20** | **24** | **28** |
| **Customers count** | 15 | 10 | 9 | 9 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 63 | 48 | 37 | 27 |
| **30 days spend greater than or equal to** | **20000** | **24000** | **28000** | **32000** |
| **Customers count** | 16 | 12 | 10 | 8 |
| **30 days transcations greater than or equal to** | **30** | **36** | **42** | **46** |
| **Customers count** | 10 | 8 | 8 | 6 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 18 | 13 | 11 | 8 |
| **Combining all the above rules** | **Column2** | **Column3** | **Column4** | **Column5** |
| **Customers count** | 2607 | 1041 | 544 | 359 |
| **% of Customers count** | 2.00% | 0.80% | 0.42% | 0.28% |
|  |  |  |  |  |
| total customer base 23-dec-25 to 15-jul-25 | 130290 |  |  |  |

**3.Robust Outlier Cutting Using 85th Percentile Thresholds based on spend**

**Step-by-Step Calculation:**

* **Q1 (25th Percentile)** = 314.2
* **Q3 (75th Percentile)** = 666.8
* **Interquartile Range (IQR)** = Q3 - Q1 = 352.6
* **Lower Limit** = Q1 - 1.5 \* IQR = -214.7
* **Upper Limit** = Q3 + 1.5 \* IQR = 1195.6

**85th Percentile of Spend** = **866.25**

**Derived Thresholds Based on 80th Percentile:**

Using 85th percentile (**866.25**) and average transaction = 1.1, the daily thresholds are:

|  |  |  |  |
| --- | --- | --- | --- |
| Day Interval | Spend Threshold | transaction Threshold | (Before Rounding) |
| Day 1 | 866.25 \* 3 =2598.75 | 1.1 \* 3 = 3.25 |  |
| Day 7 | 866.25 \* 7 =6063.75 | 1.1 \* 7 = 7.7 |  |
| Day 15 | 866.25 \* 15 = 12993.75 | 1.1 \* 15 = 16.27 |  |
| Day 30 | 866.25 \* 30 = 25987.5 | 1.1 \* 30 = 32.54 |  |

**Rounded Thresholds Used in Analysis:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1 day spend greater than or equal to** | **2500** | **3000** | **3500** | **4000** |
| **Customers count** | 878 | 507 | 341 | 243 |
| **1 day transcations greater than or equal to** | **3** | **4** | **5** | **6** |
| **Customers count** | 1010 | 241 | 88 | 47 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 1736 | 680 | 387 | 263 |
| **7 days spend greater than or equal to** | **6000** | **7000** | **8000** | **9000** |
| **Customers count** | 118 | 100 | 82 | 69 |
| **7 days transcations greater than or equal to** | **10** | **12** | **14** | **18** |
| **Customers count** | 24 | 17 | 12 | 10 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 123 | 103 | 84 | 70 |
| **15 days spend greater than or equal to** | **12000** | **14000** | **16000** | **18000** |
| **Customers count** | 48 | 35 | 25 | 18 |
| **15 days transcations greater than or equal to** | **20** | **24** | **28** | **32** |
| **Customers count** | 10 | 9 | 9 | 9 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 48 | 37 | 27 | 20 |
| **30 days spend greater than or equal to** | **25000** | **30000** | **35000** | **40000** |
| **Customers count** | 11 | 8 | 6 | 5 |
| **30 days transcations greater than or equal to** | **36** | **42** | **48** | **54** |
| **Customers count** | 8 | 8 | 6 | 6 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 12 | 10 | 7 | 7 |
|  |  |  |  |  |
| **Combining all the above rules** | **Column2** | **Column3** | **Column4** | **Column5** |
| **Customers count** | 1737 | 681 | 388 | 264 |
| **% of Customers count** | 1.33% | 0.52% | 0.30% | 0.20% |
|  |  |  |  |  |
| total customer base 23-dec-25 to 15-jul-25 | 130290 |  |  |  |

**3.Robust Outlier Cutting Using 95th Percentile Thresholds based on ATV**

**Step-by-Step Calculation:**

**Q1 (25th Percentile)** = 299.88

**Q3 (75th Percentile)** = 615.31875

**Interquartile Range (IQR)** = Q3 - Q1 = 315.43875

**Lower Limit** = Q1 - 1.5 \* IQR = -173.3

**Upper Limit** = Q3 + 1.5 \* IQR = 1,088.5

**95th Percentile of Spend** = 1198.1

**Derived Thresholds Based on 80th Percentile:**

Using 95th percentile (**1198.1**) and average transaction = 1.1, the daily thresholds are:

|  |  |  |  |
| --- | --- | --- | --- |
| Day Interval | Spend Threshold | transaction Threshold | (Before Rounding) |
| Day 1 | 1198.1 \* 3 =3594.15 | 1.1 \* 3 = 3.25 |  |
| Day 7 | 1198.1 \* 7 =8386.35 | 1.1 \* 7 = 7.7 |  |
| Day 15 | 1198.1 \* 15 = 17970.75 | 1.1 \* 15 = 16.27 |  |
| Day 30 | 1198.1 \* 30 = 35941.5 | 1.1 \* 30 = 32.54 |  |

**Rounded Thresholds Used in Analysis:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1 day spend greater than or equal to** | **3500** | **4000** | **4500** | **5000** |
| **Customers count** | 341 | 243 | 181 | 149 |
| **1 day transcations greater than or equal to** | **3** | **4** | **5** | **6** |
| **Customers count** | 1010 | 241 | 88 | 47 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 1275 | 441 | 242 | 174 |
| **7 days spend greater than or equal to** | **8000** | **9000** | **10000** | **11000** |
| **Customers count** | 82 | 69 | 58 | 54 |
| **7 days transcations greater than or equal to** | **8** | **10** | **12** | **14** |
| **Customers count** | 32 | 24 | 17 | 12 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 99 | 79 | 64 | 58 |
| **15 days spend greater than or equal to** | **16000** | **18000** | **20000** | **22000** |
| **Customers count** | 25 | 18 | 14 | 12 |
| **15 days transcations greater than or equal to** | **16** | **20** | **24** | **28** |
| **Customers count** | 15 | 10 | 9 | 9 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 33 | 21 | 16 | 14 |
| **30 days spend greater than or equal to** | **35000** | **40000** | **45000** | **50000** |
| **Customers count** | 6 | 5 | 5 | 5 |
| **30 days transcations greater than or equal to** | **32** | **38** | **44** | **50** |
| **Customers count** | 9 | 8 | 8 | 6 |
| **Combining above two rules** | **Column1** | **Column2** | **Column3** | **Column4** |
| **Customers count** | 10 | 9 | 9 | 7 |
|  |  |  |  |  |
| **Combining all the above rules** | **Column2** | **Column3** | **Column4** | **Column5** |
| **Customers count** | 1276 | 442 | 243 | 176 |
| **% of Customers count** | 0.98% | 0.34% | 0.19% | 0.14% |
|  |  |  |  |  |
| total customer base 23-dec-25 to 15-jul-25 | 130290 |  |  |  |