

DAD-220

Professor Whitaker

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Dear Quantigration Manager and Stakeholders

The product manager at Quantigration has tasked our data analytics team with preparing a report summarizing the analysis of the RMAs we have received. This report provides a non-technical and comprehensive analysis of RMAs received by Quantigration, utilizing the existing dataset.

## Top States for RMAs

Firstly, we have identified the top three states with the highest number of RMAs:

1. **Massachusetts:** With a total of 972 RMAs.
2. **Arkansas:** Following closely with 844 RMAs.
3. **Oregon:** Ranking third with 840 RMAs.

```
mysql> SELECT Collaborator.State, COUNT(*) AS Returns
-> FROM RMA
-> INNER JOIN Orders ON RMA.OrderID = Orders.OrderID
-> INNER JOIN Collaborator ON Orders.CustomerID = Collaborator.CustomerID
-> GROUP BY Collaborator.State
-> ORDER BY Returns DESC
-> Limit 3;
+-----+-----+
| State      | Returns |
+-----+-----+
| Massachusetts | 972 |
| Arkansas      | 844 |
| Oregon        | 840 |
+-----+-----+
3 rows in set (0.12 sec)
```

Listing top 3 U.S. states with the most returns.

Conversely, the states with the lowest number of RMAs are:

1. **South Carolina:** Reporting 702 RMAs.
2. **New Jersey:** With 711 RMAs.
3. **Colorado:** Tallying 718 RMAs.

```
mysql> SELECT Collaborator.state, COUNT(*) AS Returns
-> FROM RMA
-> INNER JOIN Orders ON RMA.OrderID = Orders.OrderID
-> INNER JOIN Collaborator ON Orders.CustomerID = Collaborator.CustomerID
-> GROUP BY Collaborator.State
-> ORDER BY Returns
-> LIMIT 3;
```

state	Returns
South Carolina	702
New Jersey	711
Colorado	718

3 rows in set (0.21 sec)

Listing top 3 U.S. States with the least returns.

## Most Returned Products

Our analysis further revealed the products that are most frequently returned:

- Basic Switch 10/100/1000 BaseT 48 port (BAS-48-1 C):** This product accounts for the highest percentage of returns, at 22%.
  - The 'Basic Switch 10/100/1000 BaseT 48 Port' holds the highest total of returns, at 1,704 RMAs.
- Enterprise Switch 40GigE SFP+ 48 port:** Close behind, this item comprises 16% of all RMAs.
- Enterprise Switch 10GigE SFP+ 48 port:** This product constitutes 11.4% of RMAs.

## Least Returned Item

- Basic Switch 10/100/1000 BaseT 24 port:** This item has the lowest return rate, at just 0.09%.

```
mysql> SELECT Orders.SKU, Orders.Description, ((COUNT(*)/(SELECT COUNT(*) FROM RMA)) * 100) AS Percent_Returns
-> FROM RMA
-> INNER JOIN Orders ON RMA.OrderID = Orders.OrderID
-> GROUP BY Orders.SKU
-> ORDER BY Percent_Returns DESC;
```

SKU	Description	Percent_Returns
BAS-48-1 C	Basic Switch 10/100/1000 BaseT 48 port	22.0465
ENT-48-40F	Enterprise Switch 40GigE SFP+ 48 port	16.2860
ENT-48-10F	Enterprise Switch 10GigE SFP+ 48 port	11.4119
BAS-08-1 C	Basic Switch 10/100/1000 BaseT 8 port	11.3081
ENT-24-10F	Enterprise Switch 10GigE SFP+ 24 Port	11.2628
ADV-48-10F	Advanced Switch 10 GigE Copper/Fiber 44 port coppe	10.9780
ADV-24-10C	Advanced Switch 10GigE Copper 24 port	10.9727
ENT-24-40F	Enterprise Switch 40GigE SFP+ 24 port	5.6461
BAS-24-1 C	Basic Switch 10/100/1000 BaseT 24 port	0.0878

9 rows in set (0.11 sec)

Listing the percentage or total returns for each product.

## Reasons for RMAs

Understanding the reasons behind RMAs is crucial to enhancing our operations. The top two reasons for RMAs in our company are:

1. **Incorrect Order:** This factor contributes to 35% of all RMAs, suggesting the idea that there should be necessary examination of our order processing and fulfillment procedures. I suggest that we run an investigation to find out why so many orders are being fulfilled incorrectly.
2. **Defective Items:** Defective items account for 33.6% of RMAs, this stresses the importance of strict quality control in our products. Fixing this will ensure customer satisfaction with our products.

```
mysql> SELECT Reason, (COUNT(*)/(SELECT COUNT(*) FROM RMA) * 100) AS Percent
-> FROM RMA
-> GROUP BY Reason
-> ORDER BY Percent DESC;
+-----+-----+
| Reason    | Percent |
+-----+-----+
| Incorrect | 34.9146 |
| Defective | 33.5649 |
| Other     | 31.5205 |
+-----+-----+
3 rows in set (0.03 sec)
```

Listing the percent of reason for returns.

## Summary:

The top three states with the highest number of RMAs are Massachusetts, Arkansas, and Oregon, while the lowest RMAs are reported in South Carolina, New Jersey, and Colorado.

The 'Basic Switch 10/100/1000 BaseT 48 port' is the most frequently returned product, representing 22% of all RMAs. This is followed by the 'Enterprise Switch 40GigE SFP+ 48 port' and the 'Enterprise Switch 10GigE SFP+ 48 port'. In contrast, the 'Basic Switch 10/100/1000 BaseT 24 port' has the lowest return rate.

The top two reasons for RMAs are 'Incorrect Order,' contributing to 35% of all RMAs, and 'Defective Items,' accounting for 33.6% of RMAs.

The data does hold some limitations where 31.5 percent of RMAs have a reason for 'other'. In other words, a third of our RMAs are returned for reasons other than being incorrect or defective.

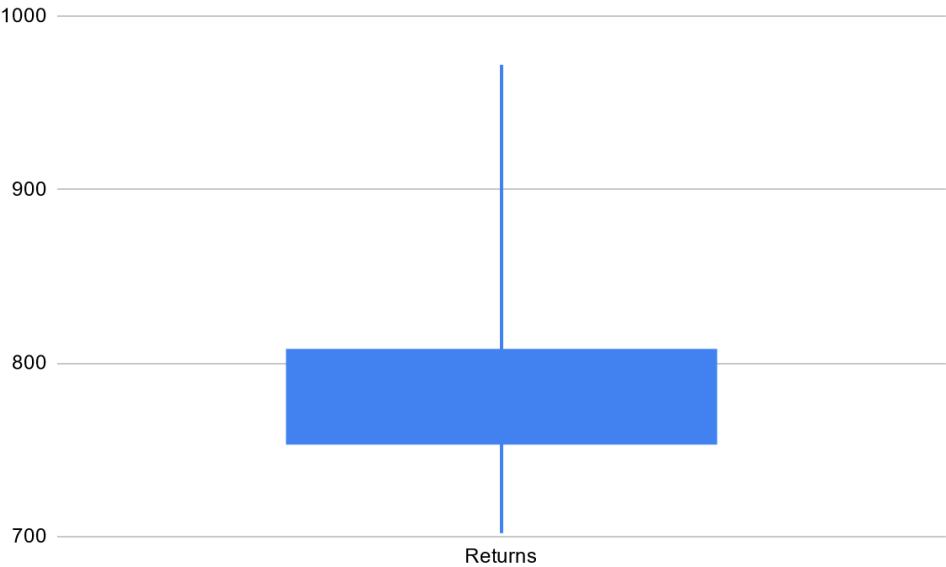
This makes finding a solution harder since you are unable to find the problem with that 31.5 percent of returns.

In conclusion, our analysis of RMAs provides valuable information for the product manager and other stakeholders at Quantigration. By addressing the issues related to incorrect orders and defective items, we can significantly reduce RMAs and improve customer satisfaction. This data, if acted upon, helps us to sell more items and reduce the amount of customer return, in turn improving customer satisfaction. These findings empower us to make informed decisions that will ultimately enhance the efficiency and quality of our products and services.

### Additional Information

```
mysql> SELECT COUNT(*)
-> FROM RMA;
+-----+
| COUNT(*) |
+-----+
|    37566 |
+-----+
1 row in set (0.01 sec)
```

Total number of returns



Graph displaying the averages and outliers of returns for every state.

```
mysql> SELECT Collaborator.State, COUNT(*) AS Returns
-> FROM RMA
-> INNER JOIN Orders ON RMA.OrderID = Orders.OrderID
-> INNER JOIN Collaborator ON Orders.CustomerID = Collaborator.CustomerID
-> GROUP BY Collaborator.State
-> ORDER BY Returns DESC;
```

State	Returns
Massachusetts	972
Arkansas	844
Oregon	840
West Virginia	837
Alabama	836
Idaho	822
Connecticut	822
Mississippi	821
Tennessee	819
Delaware	811
Kentucky	809
Montana	808
New Mexico	807
Wisconsin	807
Iowa	804
Pennsylvania	802
Indiana	802
South Dakota	797
Louisiana	794
Minnesota	794
Wyoming	786
Vermont	785
Hawaii	783
New York	782
Washington	781
Missouri	777
Arizona	775
North Dakota	774
North Carolina	773
Maryland	767
Florida	765
Rhode Island	764
New Hampshire	764
California	764
Texas	755
Utah	755
Oklahoma	751
Maine	748
Illinois	747
Nevada	745
Michigan	744
Ohio	735
Kansas	725
Nebraska	723
Georgia	719
Colorado	718
New Jersey	711
South Carolina	702

48 rows in set (0.67 sec)

Number of returns by state