# Part (I) – Analyzing Low Fulfillment Suppliers.

To ensure that "PQR Ecommerce Service" preserves customer experience and maintains growth, it is important to receive high fulfillment rates from suppliers on a regular basis. You are tasked with diagnosing the major categories driving low fulfillments for the last 45 days and suggest a plan of action through which you can drive higher fulfillments from different suppliers across categories.
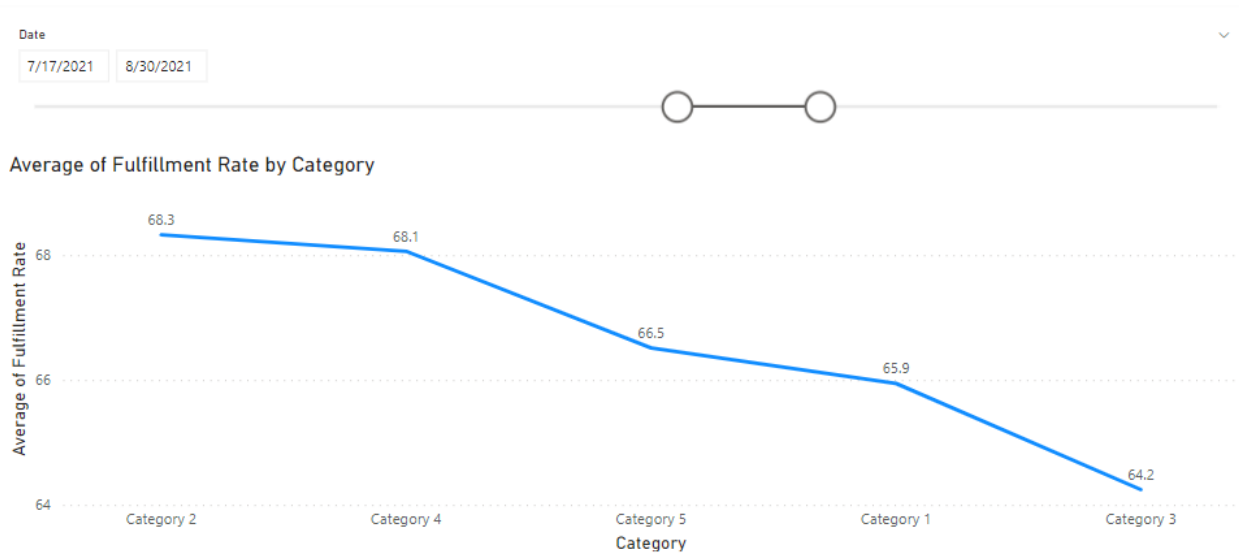
Since the last date in Fulfilment data set is 30/august/2021, therefore 45 before that is 17/July/21 therefore we have here a bar chart showcasing the categories from low to high w.r.t average fulfillment rate.

Plan of action to drive higher fulfillments from different suppliers across categories:

- In the following images we can see the breakdown of suppliers by Average of fulfillment rate in the last 45 days, this clearly shows us that there is an opportunity to replace the suppliers having low fulfillment rates with suppliers having a high fulfillment rate.
- The lowest fulfillment rate average was found in the "Category 3" however the differences between the suppliers are not very huge. Therefore, searching for new supplier would be better.

Category, Supplier
∨ ☐ Category 1
∨ ☐ Category 2
∧ ■ Category 3
　■ D
　■ E
　■ F
∨ ☐ Category 4
∨ ☐ Category 5

Average of Fulfillment Rate by Supplier

E — 63.7
F — 64.0
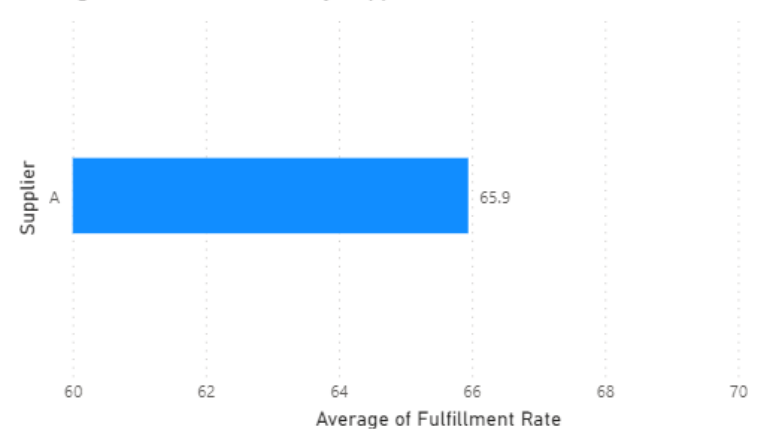D — 65.0

Average of Fulfillment Rate

○
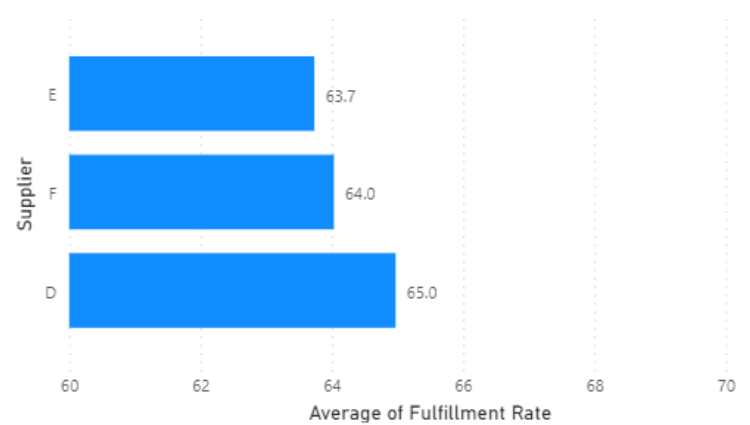
- Similarly, in "Category 1" we need to try to find out new vendors are currently there is only 1 supplier and their fulfillment rate is not very good either.

Category, Supplier
∨ ■ Category 1
∨ ☐ Category 2
∧ ☐ Category 3
　☐ D
　☐ E
　☐ F
∨ ☐ Category 4
∨ ☐ Category 5

Average of Fulfillment Rate by Supplier

A — 65.9

Average of Fulfillment Rate

○

- Categories 5, 2 and 4 have good overall fulfillment rates and it can be seen that the differences between the Supplier with Lowest fulfillment rates and supplier with higher fulfillment rates is almost 4-5% which means that if we replace the suppliers with low fulfillment rates and give their business to suppliers with a higher fulfillment rate, we may increase the overall fulfillment rates.

Category, Supplier
- ⌄ ☐ Category 1
- ⌄ ☐ Category 2
- ⌃ ☐ Category 3
  - ☐ D
  - ☐ E
  - ☐ F
- ⌄ ◼ Category 4
- ⌄ ☐ Category 5

Average of Fulfillment Rate by Supplier

Supplier	
I	65.4
G	68.1
H	70.8

Average of Fulfillment Rate

Category, Supplier
- ⌄ ☐ Category 1
- ⌄ ☐ Category 2
- ⌃ ☐ Category 3
  - ☐ D
  - ☐ E
  - ☐ F
- ⌄ ☐ Category 4
- ⌄ ◼ Category 5
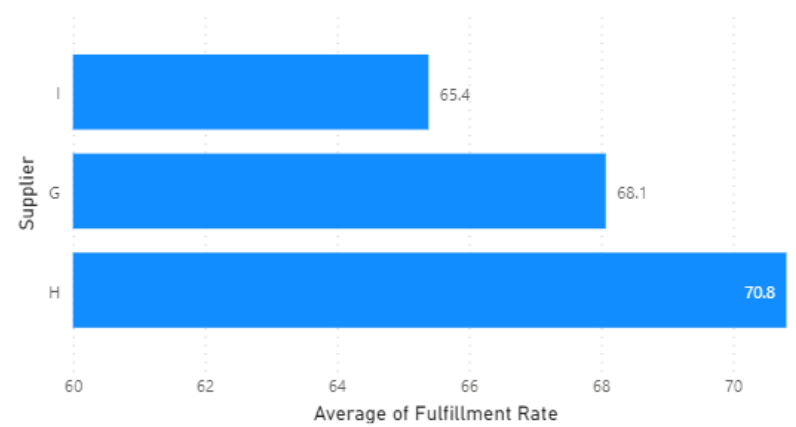
Average of Fulfillment Rate by Supplier

Supplier	
J	64.8
K	68.2

Average of Fulfillment Rate

Category, Supplier
- ⌄ ☐ Category 1
- ⌄ ◼ Category 2
- ⌃ ☐ Category 3
  - ☐ D
  - ☐ E
  - ☐ F
- ⌄ ☐ Category 4
- ⌄ ☐ Category 5
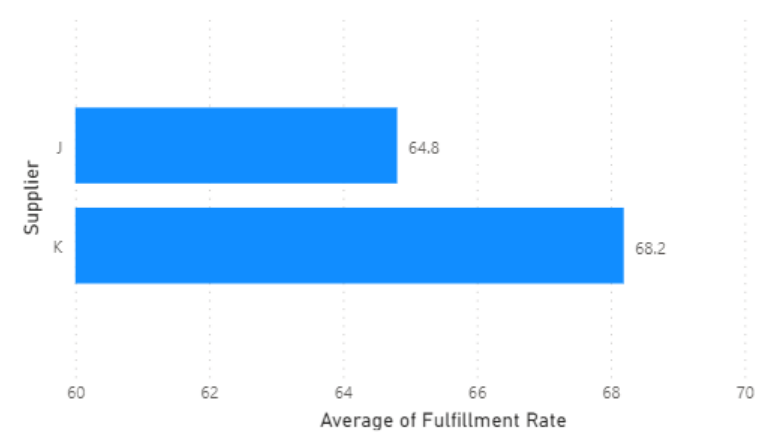
Average of Fulfillment Rate by Supplier

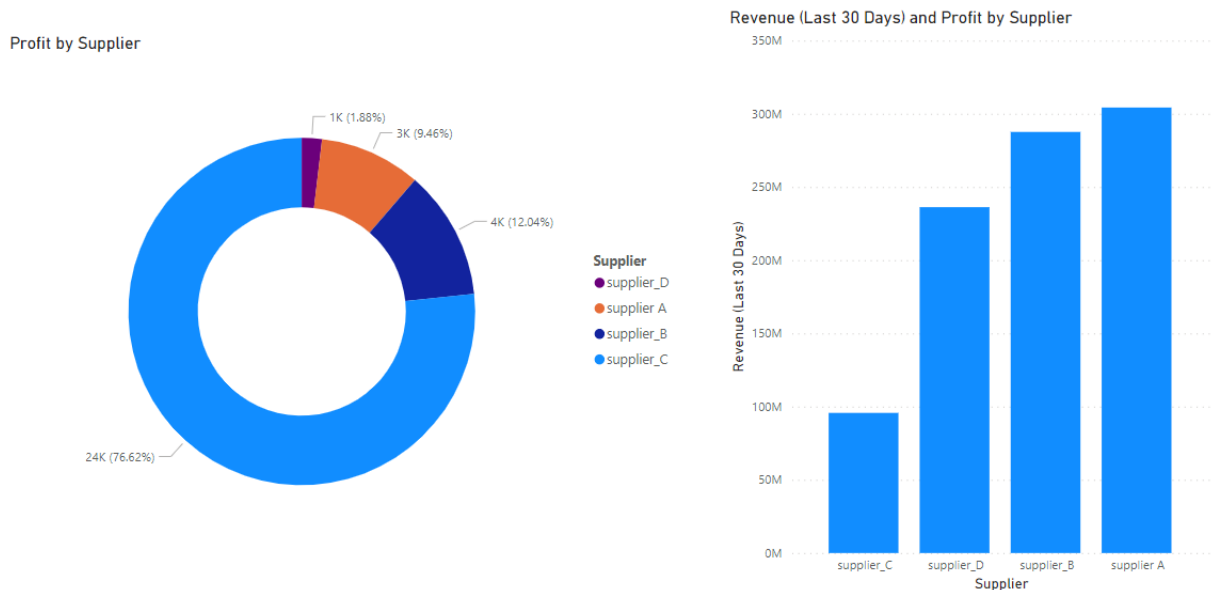| Supplier	
B	66.1
C	70.7

Average of Fulfillment Rate
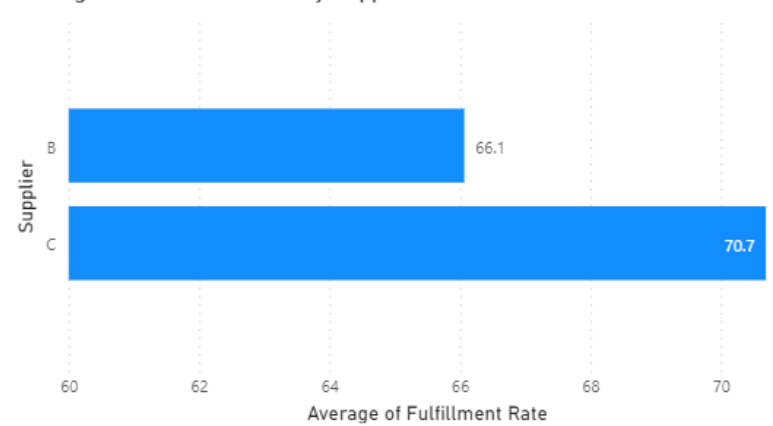
Part (II) – Analyzing Margins

While setting up operations back in December, we had limited bandwidth and leverage to negotiate with suppliers. Given our recent growth we are now in a position to revisit our agreements with suppliers and negotiate better terms. You are tasked with identifying 2 suppliers to re-negotiate with. Which 2 suppliers would you prioritize and why?

- Firstly, we calculate the profit we're getting on each supplier, and in our consideration the suppliers with the least amount of Profit and Revenue would have to be renegotiated.

Profit by Supplier / Revenue (Last 30 Days) and Profit by Supplier

- We can see in the above visual that supplier "D" and "A" are the least profitable suppliers, however in terms of revenue supplier "D" is not very bad, this could be due to the nature of the product.
- Therefore, I would prioritize re-negotiating with supplier "D" and "A".

Part (III) – Setting up KPIs

a) **You are tasked with judging supplier performance for the past three months. What are the top 5 KPIs that you would use to accurately judge supplier performance.**
    - We do not have sufficient data to conduct an analysis for 3 months

KPI Distinct Dates	Fulfillment Distinct Dates	Complaints Distinct Dates
30	39	43

    -
    - **Top 5 KPIs to to accurately judge supplier performance.**

1) Profit
2) Count of Product (Total Sale of one product)
3) Average Daily Sales
4) Selling Price
5) Cost Price

b) **After identifying the top 5 KPIs, build out a template scorecard through which you will be able publish in depth supplier reports on a quarterly basis.**

Supplier	Cost Price	Selling Price	Profit	Avg Daily Sales	Total Sales
⊟ supplier_D	**35550**	**36146**	**596**	**40,135.10**	**90**
sku_e	2550	2694	144	4,316.86	30
sku_c	29700	29880	180	30,235.67	30
sku_d	3300	3572	272	5,582.57	30
⊟ supplier A	**9000**	**12000**	**3000**	**13,079.00**	**30**
sku_j	9000	12000	3000	13,079.00	30
⊟ supplier_B	**18600**	**22420**	**3820**	**30,882.00**	**60**
sku_A	9600	10420	820	15,739.50	30
sku_i	9000	12000	3000	15,142.50	30
⊟ supplier_C	**257700**	**282000**	**24300**	**205,519.54**	**90**
sku_f	23700	23000	-700	35,234.04	30
sku_h	90000	96000	6000	70,954.00	30
sku_g	144000	163000	19000	99,331.50	30
Total	**320850**	**352566**	**31716**	**289,615.64**	**270**

Part (IV) – Reducing Product Quality Complaints

Maintaining customer experience is an extremely high priority for "PQR Ecommerce Service". Currently, "PQR Ecommerce Service" receives product quality complaints in 5% of all orders which is highly unacceptable. You are tasked with diagnosing the major causes of customer complaints and suggesting initiates to cut down product quality / damage complaints by half.

- Major causes of customer complaints
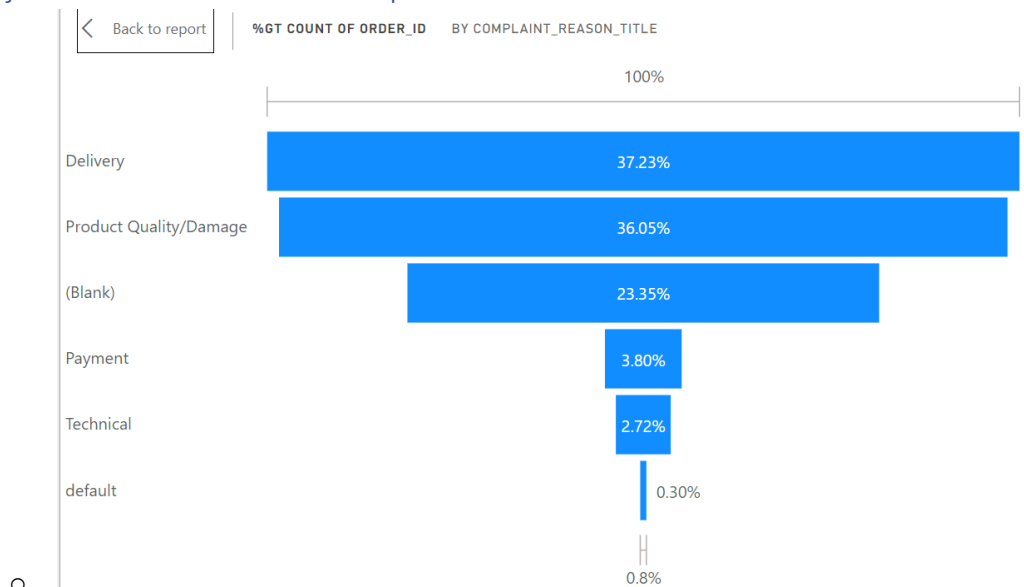
- The major causes of customer complaints were found to be Delivery issues, Product Quality/damage and Blank

  - I further drilled down "Blank" and found out that Blanks represented missing data so no sub reason or any other detail could be found of those records.

 | complaint_reason_title | %GT Count of order_id |
    |---|---|
    | ⊟ | **23.35%** |
    | | 23.35% |
    | ⊟ **default** | **0.30%** |
    | | 0.30% |
    | ⊟ **Delivery** | **37.23%** |
    | | 0.40% |
    | Other | 14.56% |
    | Rider Behaviour | 2.57% |
    | Rider did not have change | 0.96% |
    | Rider not carrying CNIC | 0.07% |
    | Rider Was Late | 19.48% |
    | ⊞ **Payment** | **3.80%** |
    | ⊞ **Product Quality/Damage** | **36.05%** |
    | ⊞ **Technical** | **2.72%** |
    | **Total** | **100.00%** |

- The breakdown of "Delivery" and "Product Quality/damage" in terms of Percentage Grand Total of individual complaints is as follows:

complaint_reason_title	%GT Count of order_id
Delivery	**37.23%**
Rider Was Late	19.48%
Other	14.56%
Rider Behaviour	2.57%
Rider did not have change	0.96%
	0.40%
Rider not carrying CNIC	0.07%
Product Quality/Damage	**36.05%**
Damaged	13.41%
Other	10.80%
Expired	7.49%
Missed	7.12%
	1.03%
⊞	23.35%
⊞ **Payment**	**3.80%**
⊞ **Technical**	**2.72%**
⊟ **default**	**0.30%**
	0.30%
Total	**100.00%**

- o Initiates to cut down product quality / damage complaints by half.
  - o Firstly, here are the top suppliers with most Product quality and damage complaints, in order to reduce these complaints, we may either remove the top complaint suppliers if that is not possible then we can try to create a check and balance specifically to these suppliers where warehouse staff may specifically check the products from the top 5 of these suppliers before dispatching those orders.
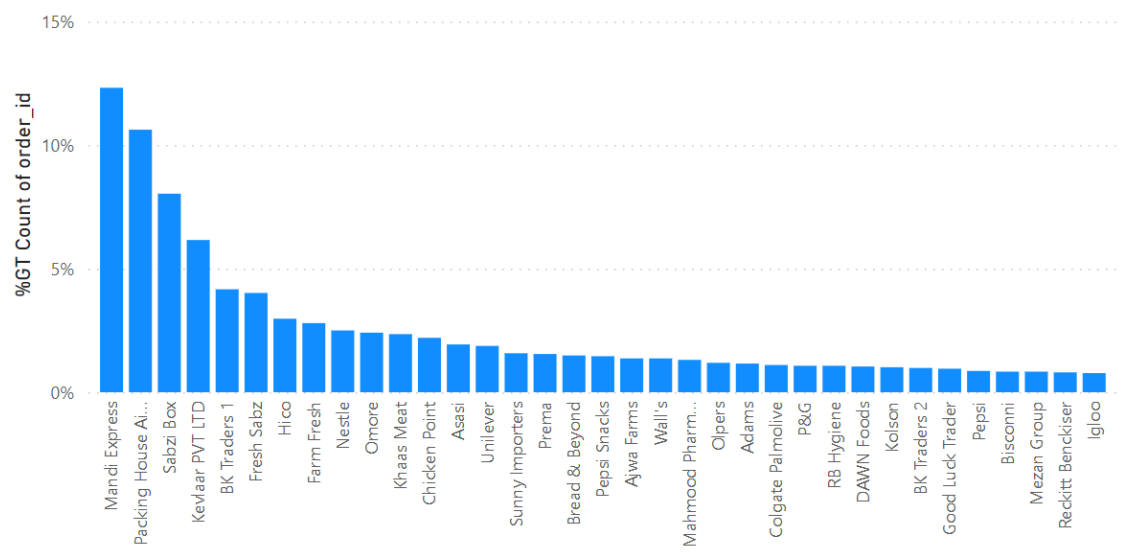
○ Another important initiative could be taken on the Warehouses having the largest count of Product quality and damage complaints by specifically enhancing quality controls at these warehouses.

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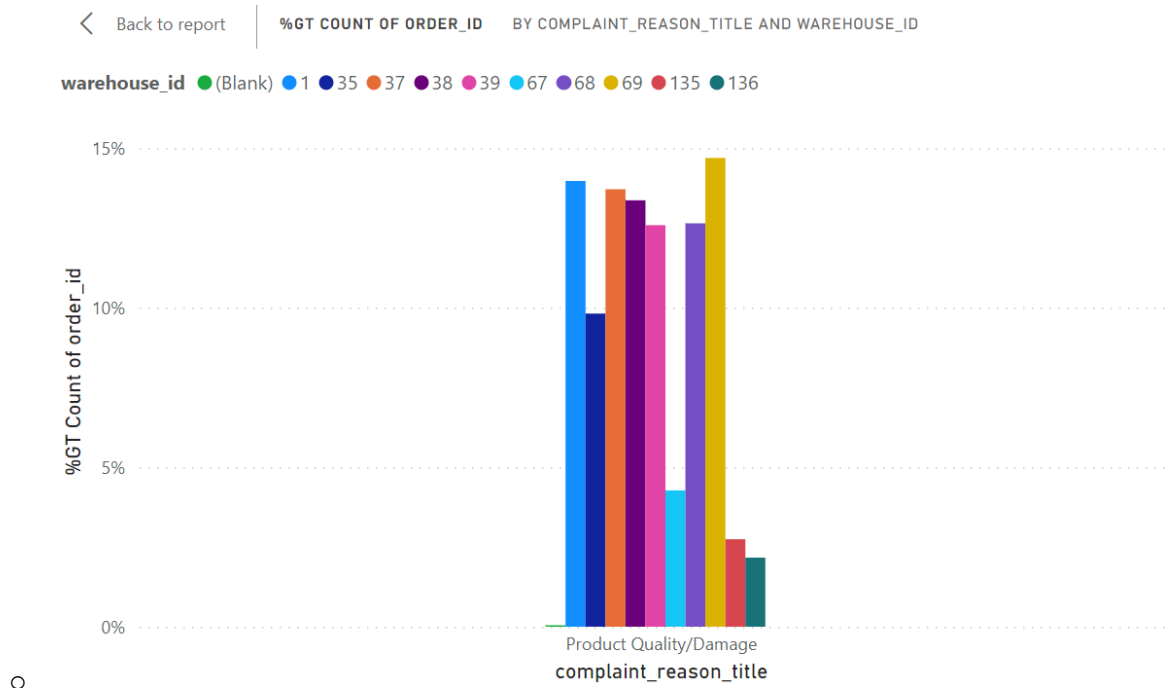
○ If we further drilldown on these complaints by their sub_reason_title we find that majority of these complaints were either damaged, other or expired.

- The damaged goods problem is most likely to be caused during delivery so delivery related quality assurance should be placed.
- Whereas the expired products can easily be identified before dispatch by in warehouse.