TITLE: SHIPMENT AND DELIVERY PROJECT

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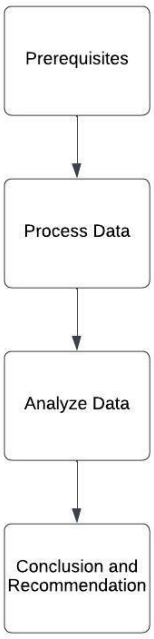
OUTPUT: PDF DOCUMENT

FRAMEWORK

To complete this project, I have developed a framework for myself to ensure a more organized workflow. The following are the steps:



Flowchart 1 Framework

1. Prerequisites: In this stage, the background and variables within the data are described. Additionally, this stage outlines the objectives or goals to be achieved.
2. Process Data: In this stage, mathematical operations using Excel formulas are performed to create new variables for data analysis. Data merging is also conducted using Excel formulas to enhance the depth of analysis.
3. Analyze Data: In this stage, data exploration and visualization are carried out.
4. Conclusion and Recommendation: In this stage, conclusions are drawn from the data analysis, and appropriate recommendations are provided based on the analysis results.

SHIPMENT AND DELIVERY PROJECT

PREREQUISITES

ABOUT DATA

This dataset contains shipment data. This data is collected from December 2021 to August 2022. In this dataset, information includes the shipping date, date of item receipt, initial location of the dispatched item, destination location, type of item shipped, shipping code, details about wooden packaging, insurance information, item weight, and the total shipping cost.

This data is also supplemented with a glossary containing distances from one location point to another. Additionally, there is city name data corresponding to each city code. This glossary data serves to complement the dataset.

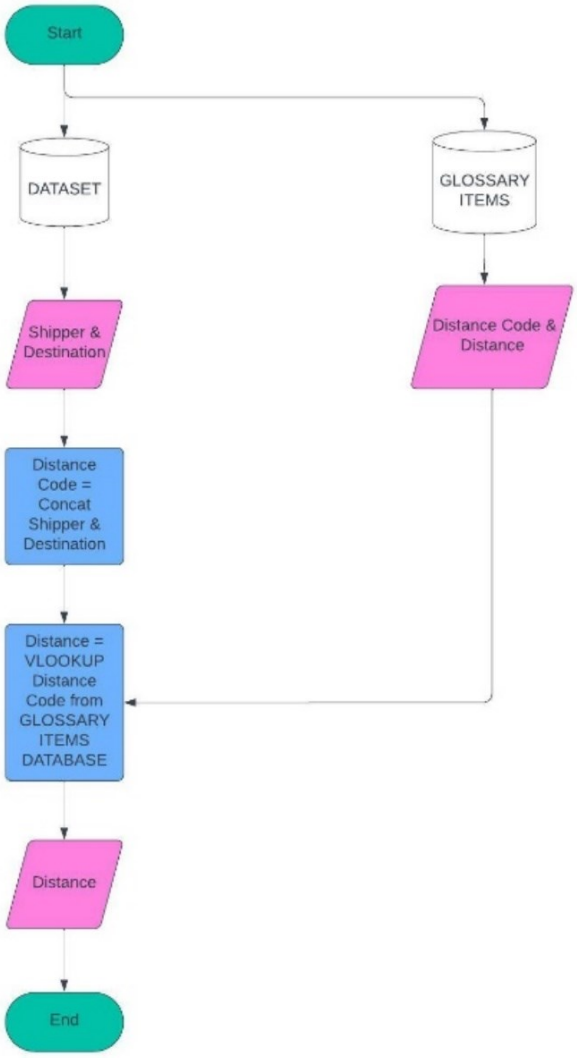
GOALS

The goals to be achieved are as follows:

- Understand the trend of the FPP quantity and Total Amount per month.
- Determine order fulfillment (Orders that can be fulfilled or delivered in the same month as the ship date).
- Identify correlations within the data.

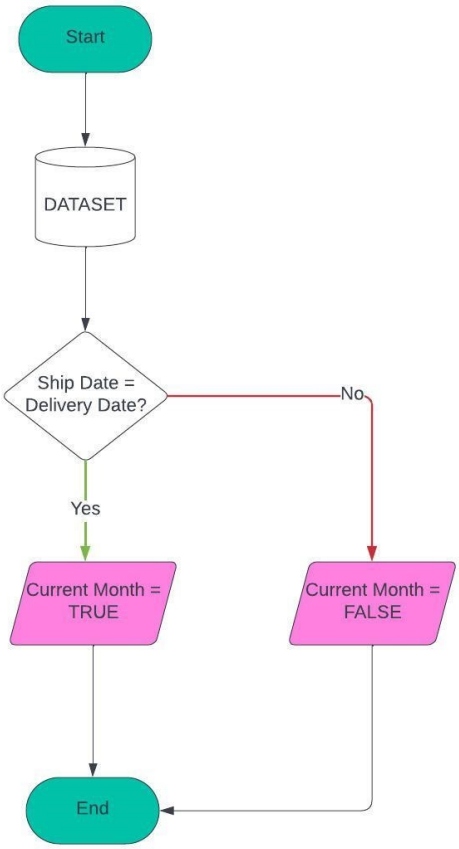
PROCESS DATA

By leveraging the existing glossary data, a new variable is created, "distance." This is the calculation of the distance from one point to another.



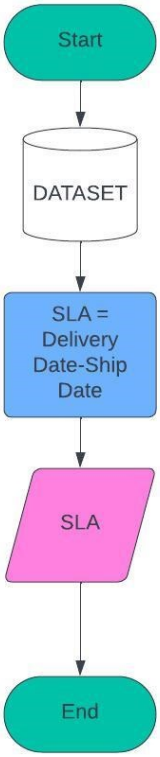
Flowchart 2 Create New Variable "Distance"

An operation is performed to generate a new variable to determine whether the item arrives in the same month as the month it was shipped.



Flowchart 3 Create New Variable "Current Month?"

A new variable is also created, containing the total number of days it takes for an item to be shipped until its arrival.



Flowchart 4 Create New Variable "SLA"

ANALYZE DATA

TOTAL ORDERS AND TOTAL AMOUNT PER MONTH

The total amount or transaction value from December 2021 to August 2022 shows an increasing trend. December 2021 has the lowest total transaction value compared to other months. In January 2022, the total transaction value is significantly above the average.

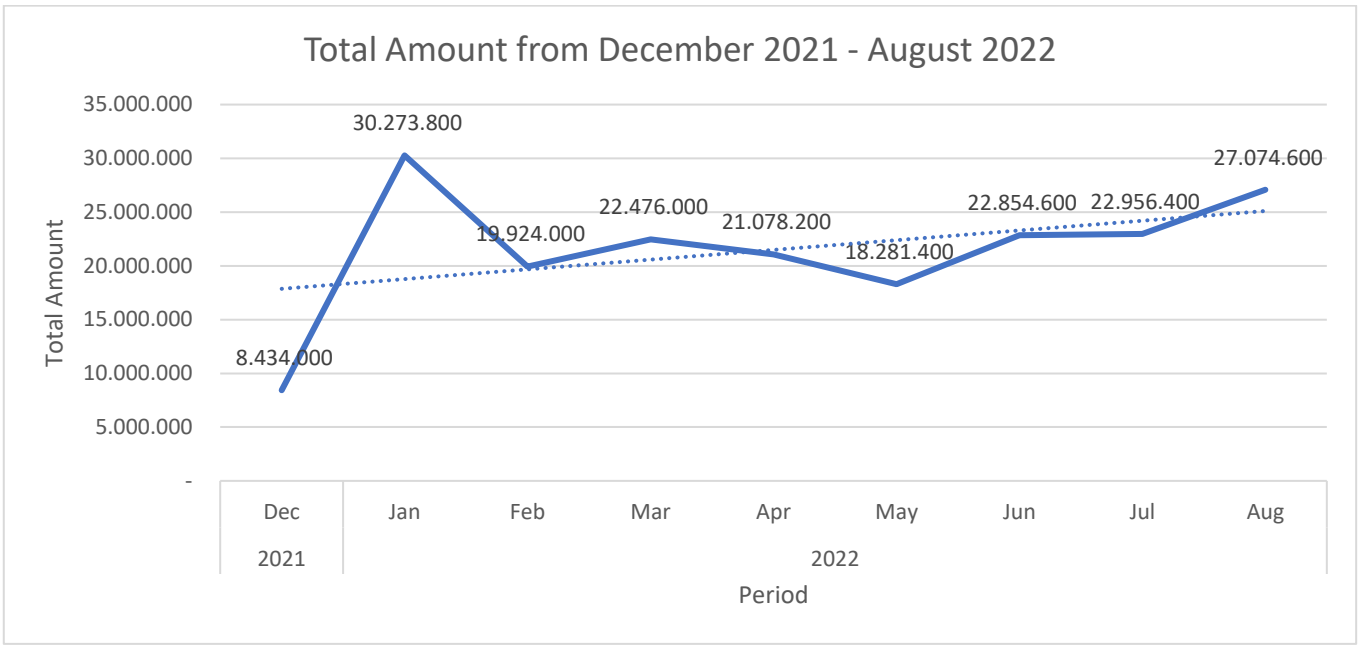


Figure 1 Total Amount from December 2021 - August 2022

The total quantity of items distributed from December 2021 to August 2022 exhibits a rising trend. December 2021 has the lowest total quantity of distributed items compared to other months. The highest total quantity of distributed items is observed in August 2022.

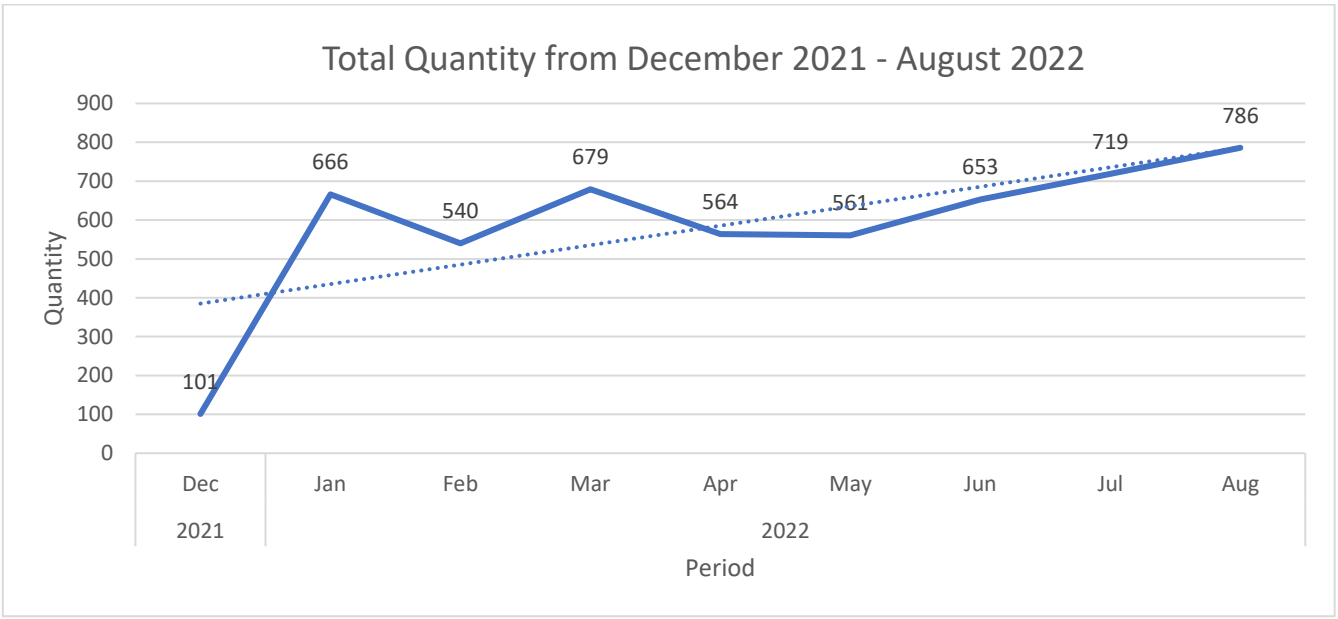


Figure 2 Total Quantity from December 2021 - August 2022

The transaction value calculation process also includes the type of item shipped, whether it is packed with wood, and whether it has insurance coverage. Additionally, the distance is taken into account. Therefore, each shipped item will have its own transaction value.

ORDER FULLFILLMENT PER MONTH

The order is categorized as fulfilled if the shipping month and the receiving month fall within the same month. December 2021 has a very low order fulfillment rate compared to other months.

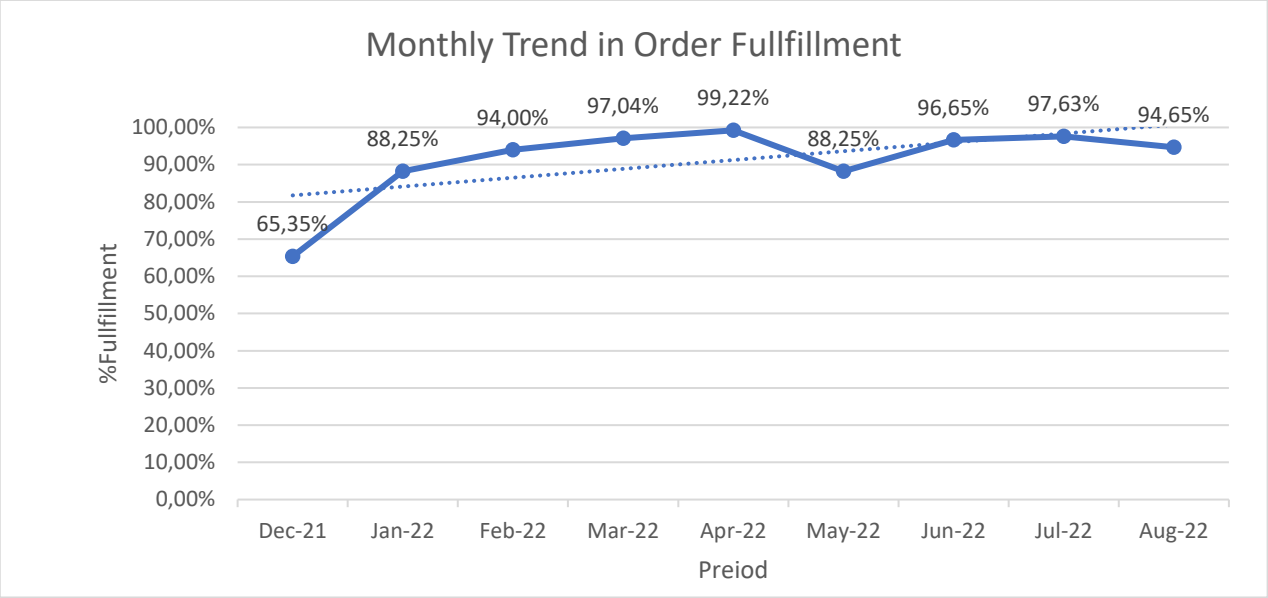


Figure 3 Monthly Trend in Order Fullfillment

As much as 93.9% of the orders are categorized as fulfilled. Order fulfillment from December 2021 to August 2022 shows an increasing trend. After my analysis, the remaining 6.1% categorized as unfulfilled orders are those shipped at the end of the month. Because the delivery process also takes time, these shipments arrive in the following month, resulting in a mismatch between the shipping month and the receiving month.

DATA CORRELATION

For this correlation analysis, I have identified the dependent variable, which serves as the y-axis in all the graphs. I have determined the dependent variable to be the total amount or transaction value. This decision is based on the consideration that ultimately, the company will need to assess the total amount of money for transactions. Additionally, a heatmap graph has been created to visualize the correlations between the data.

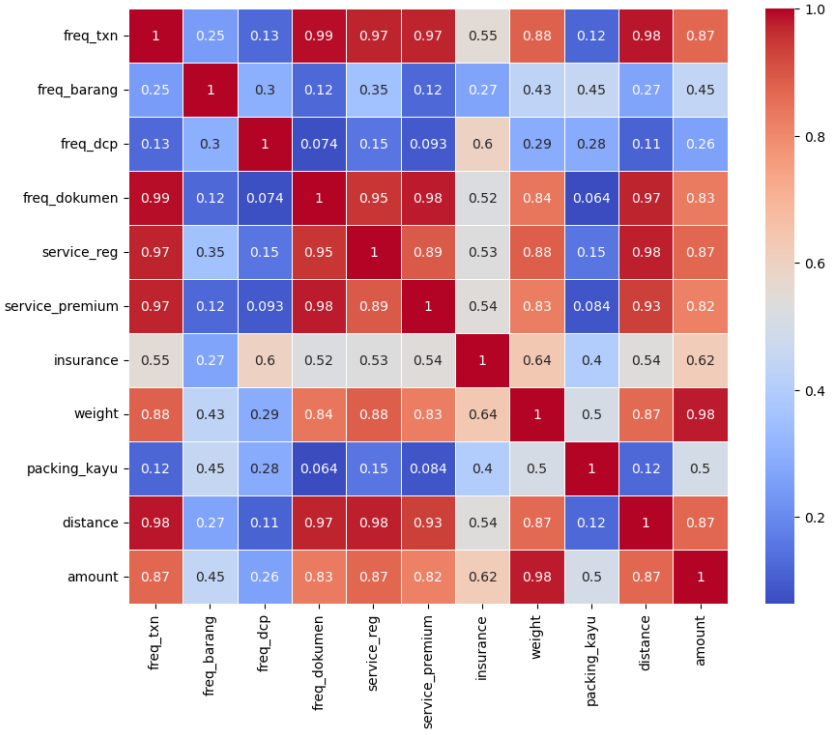


Figure 4 Data Correlation

As I have previously decided to examine the correlation of each variable with the amount or transaction value, several variables show significant correlations with the amount. These include weight, distance, regular service, frequency of all item types delivered, frequency of documents delivered, and premium service (listed in order of their correlation values from biggest to lowest).

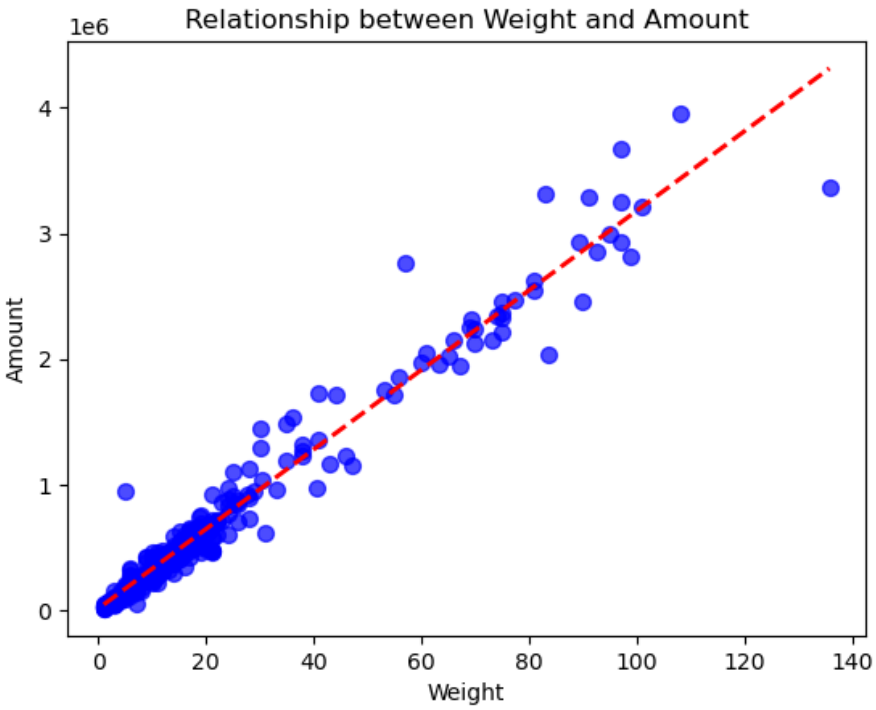


Figure 5 Relationship between Weight and Amount

The weight of the shipped items has a high correlation with the total amount or transaction value generated. The "weight" refers to the daily sum of weights. The heavier the shipped items, the larger the total amount generated, as additional charges are incurred for increased weight.

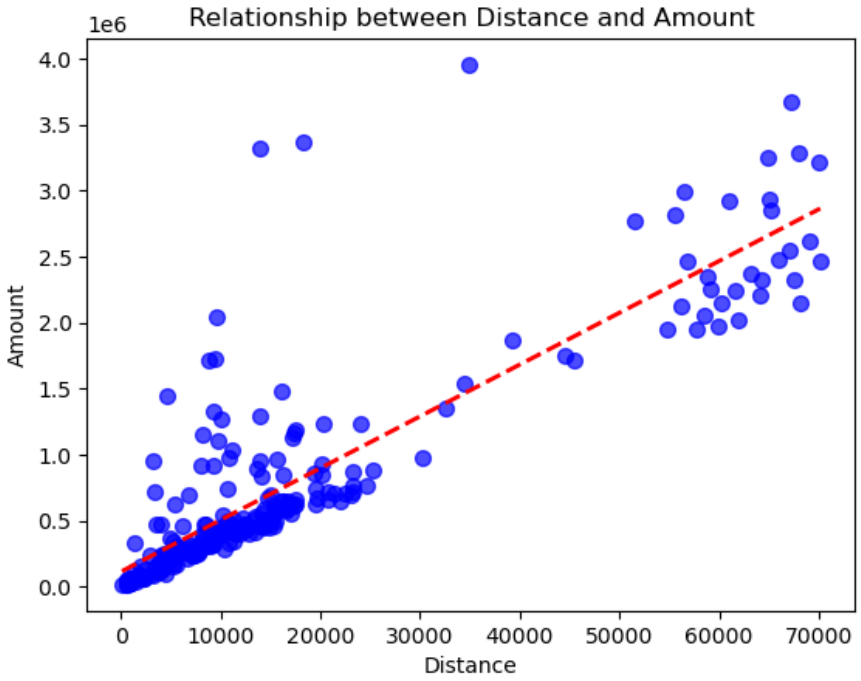


Figure 6 Relationship between Distance and Amount

The total distance covered by the shipped items also has a high correlation with the total amount. The term "distance" here refers to the total distance covered per day. The greater the distance covered, the larger the total amount or transaction value will be. As the kilometers increase, the transaction value also increases.

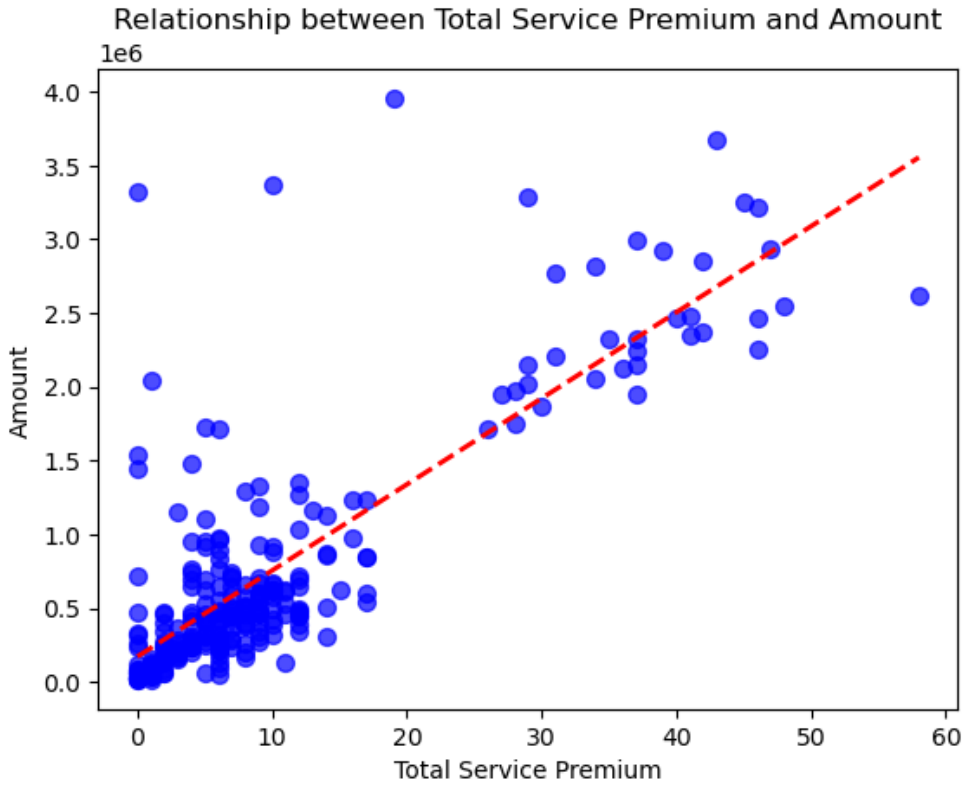


Figure 7 Relationship between Total Service Premium and Amount

The total number of premium services also has a high correlation with the total amount. The term "total number of premium services" refers to the overall count of premium services per day. The greater the number of premium services used, the larger the total amount will be.

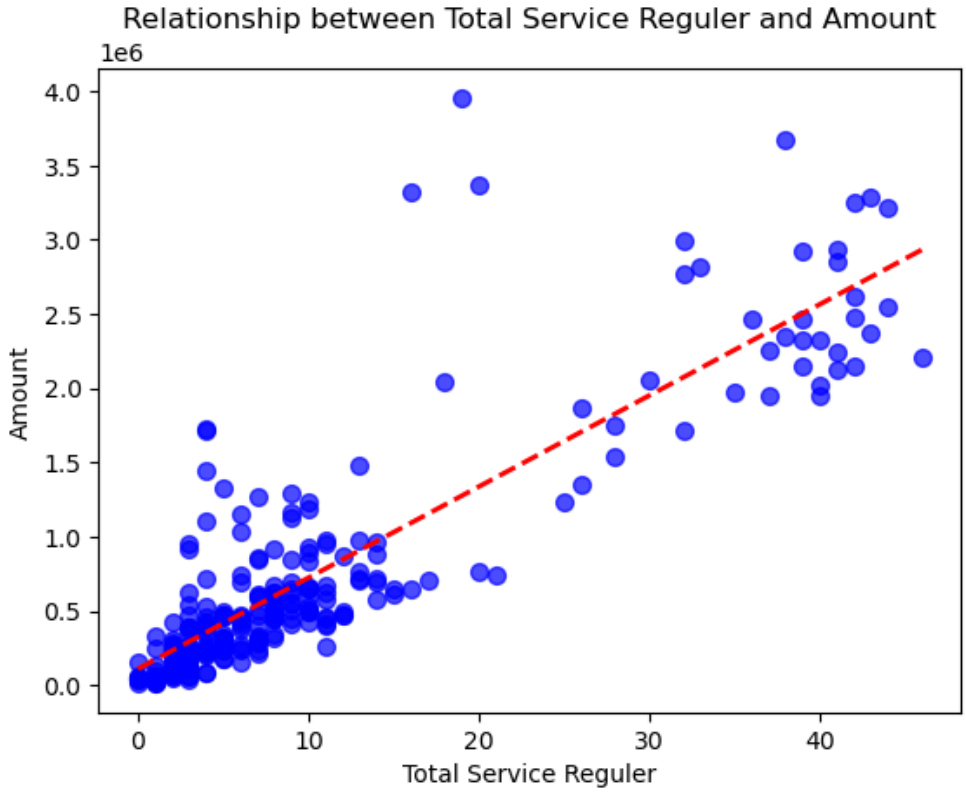


Figure 8 Relationship between Total Service Reguler and Amount

The total number of regular services also has a high correlation with the total amount. The term "total number of regular services" refers to the overall count of regular services per day. The greater the number of regular services used, the larger the total amount will be.

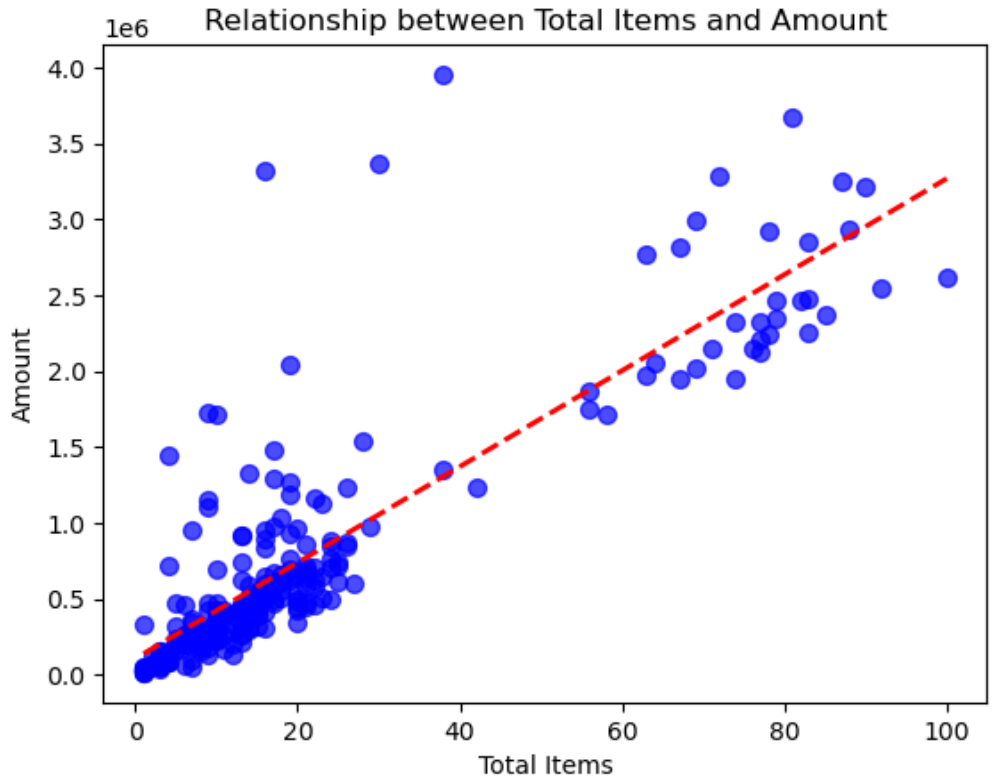


Figure 9 Relationship between Total Items and Amount

The total quantity of items (all types) shipped also has a high correlation with the total amount. The term "total quantity of items" refers to the overall count of items shipped per day. The greater the quantity of items shipped, the larger the total amount or transaction value will be.

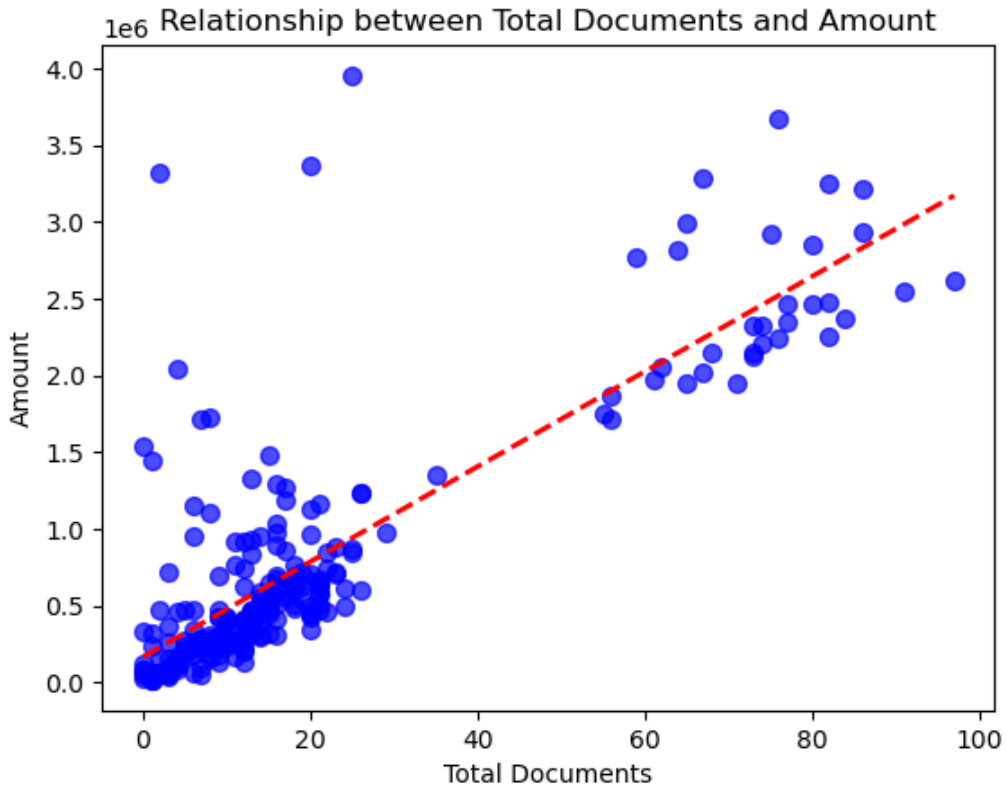


Figure 10 Relationship between Total Documents and Amount

The total quantity of items with document types shipped also has a high correlation with the total amount. The term "total quantity of items with document types" refers to the overall count of documents shipped per day. The greater the quantity of documents shipped, the larger the total amount or transaction value will be.

After reviewing all the graphs, the correlation values depicted in the heatmap graph can also be observed in the red trendline present in each individual graph. It can be seen that the weight of the shipped items has the highest correlation value. Therefore, the total amount is highly influenced by the weight of the shipped items.

CONCLUSION

Based on the analysis, the following conclusions can be drawn:

- December 2021 has the lowest total transaction value compared to other months. In January 2022, the total transaction value is significantly above the average. December 2021 also has the lowest total quantity of distributed items compared to other months, while the highest total quantity of distributed items is observed in August 2022.
- December 2021 has a very low order fulfillment rate compared to other months. As much as 93.9% of the orders are categorized as fulfilled. Order fulfillment from December 2021 to August 2022 shows an increasing trend. Unfulfilled orders in December 2021 are mostly those shipped at the end of the month, taking into account the time needed for delivery, resulting in the shipment arriving in the following month, causing a mismatch between the shipping and receiving months.
- The dependent variable is determined to be the total amount or transaction value. This decision is based on the consideration that ultimately, the company will need to assess the total amount of money for transactions. After reviewing all the graphs and correlation values, it is evident that the total amount is highly influenced by the weight of the shipped items.

RECOMMENDATION

I will provide recommendations for two aspects: cost efficiency and transaction control. Regarding cost efficiency, it is already known that the total weight of shipped items has a high correlation with the total amount. Costs can be optimized by paying attention to the weight of the shipped items. Below are some data points that can serve as references for cost efficiency recommendations.

Table 1 Total Actual Weight per Item Type

Item Type	Total Actual Weight
KIRIM BARANG	1.152
KIRIM DCP	175
KIRIM DOKUMEN	4.669
Grand Total	**5.997**

Table 2 Average Actual Weight per Item Type

Item Type	Average of Actual Weight
KIRIM BARANG	3,28
KIRIM DCP	6,75
KIRIM DOKUMEN	1,05
Grand Total	**1,25**

Table 3 Total Quantity per Item Type

Item Type	Total Quantity
KIRIM BARANG	355
KIRIM DCP	26
KIRIM DOKUMEN	4888
Grand Total	**5269**

Documents are lightweight items but have the highest quantity of shipments. For document weighing, it is recommended to pay closer attention, so that not every weight of the document sent is assigned a weight of 1. For document shipments, it would be more efficient to maximize them. In other words, document shipments need to be collected all the document before sending.

Table 4 Top 10 Document Quantity per Distance Code

Distance Code	Quantity
LOKASI 11LOKASI 1	169
LOKASI 219LOKASI 1	160
LOKASI 117LOKASI 1	104
LOKASI 79LOKASI 1	101
LOKASI 139LOKASI 1	92
LOKASI 177LOKASI 1	83
LOKASI 69LOKASI 1	72
LOKASI 58LOKASI 1	69
LOKASI 218LOKASI 1	66
LOKASI 116LOKASI 1	61

Document shipments are frequently sent to Location 1, which is Central Jakarta. The majority of documents are dispatched from Location 11 and Location 219, namely Pontianak and Bandung. For these two locations, there is a need for document shipment efficiency. It would be preferable to collected all the documents first before sending them, while still paying attention to the weighing of the documents.

The second recommendation I provide is related to transaction control. In my opinion, the focus should be on the delivery time of goods. After reviewing the online website courier services, which is one of the largest courier services in Indonesia, deliveries from within the country typically take 1-10 days. Therefore, shipments exceeding 10 days should be questioned.

Table 5 The total number of order codes with delivery times exceeding 10 days

Total Days	Count of Order Code
11	1
13	2
15	1
16	2
17	1
21	1
22	1
24	2
28	1
36	1
Grand Total	**13**

There are 13 orders that have a total delivery time exceeding 10 days. In my opinion, for transaction control, if it exceeds 10 days, the destination location should communicate or ask to the shipper city.