

E-Commerce Data Analysis Dashboard

This presentation explores the power of data analysis in e-commerce, using a BI tool to gain insights into customer metrics, profitability, and shipping optimization.

 by Data Doctors



Agenda

1

Project Overview and Objectives

Understanding the project's goals and scope.

2

Data Sources

Exploring the data used for analysis.

3

Key Metrics and Insights

Identifying key performance indicators.

4

Customer Metrics and Segmentation

Analyzing customer behavior and segmentation.

5

Profitability Analysis

Evaluating profit margins and drivers.

6

Shipping Cost Optimization

Optimizing shipping strategies for cost savings.

7

Product Count and Shipping Impact

Analyzing the relationship between product count and shipping costs.

8

Yearly Performance Distribution

Identifying seasonal trends and performance patterns.

9

Conclusion and Key Takeaways

Summarizing key findings and recommendations.

Project Overview and Objectives

Project Objective

This project focuses on building an E-Commerce Data Analysis Dashboard using a BI tool to provide insights into key performance indicators (KPIs) such as customer counts, profitability, shipping costs, and the impact of product quantities on shipping and profits.

Business Problem

The goal is to help stakeholders better understand customer behaviors, optimize shipping costs, and maximize profitability by analyzing how product counts and sales patterns affect both shipping and profit margins.

Why BI Tools?

Power BI is chosen due to its powerful data visualization capabilities, enabling interactive exploration of trends and insights. With real-time insights and dynamic dashboards, the project helps decision-makers take actions based on data-driven evidence.

Data Sources

Fact Tables

- fact_sales: Core sales transaction data
- Transaction Date: Date of sales transaction
- Quantity: Units sold in each transaction
- Unit Price: Price of each product sold
- Customer ID and Invoice No: Links sales to customers and orders

Dimension Tables

- dim_products: Detailed product information

Landed Cost: Cost of acquiring the product

Shipping_Cost_1000_mile: Base cost to ship 1,000 miles per unit

- dim_customers: Detailed customer information

Customer ID, Customer Name, State: Key data for tracking customer metrics



Key Metrics and Insights

1

Customer Count

The total number of unique customers making purchases.

2

Total Profit

A measure of profitability derived from sales revenue, product cost, and shipping expenses.

3

Shipping Cost

Analysis of how shipping costs fluctuate based on product count and order size.

4

Product Count

Understanding how product quantity affects overall profitability and logistics.



75K

Sold units



11K

#Customers



\$1.53M

Total income



307.80K

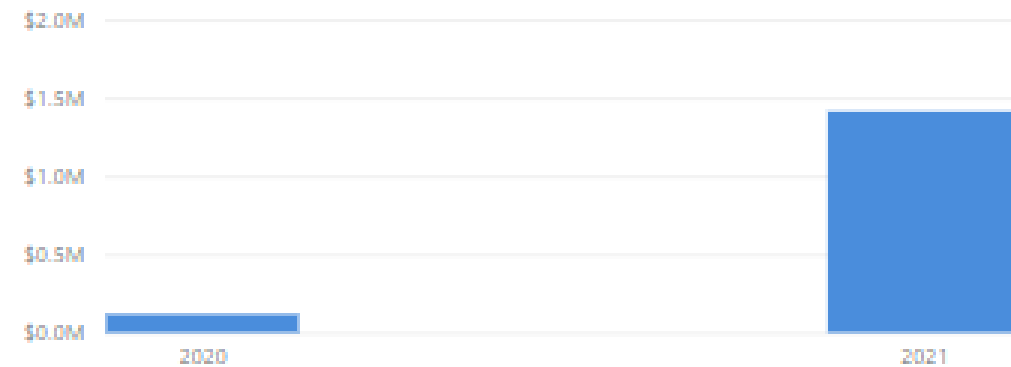
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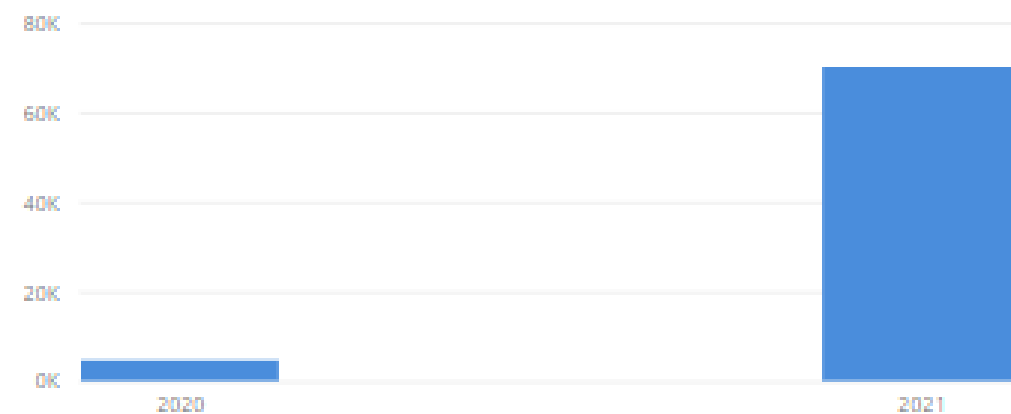
11K

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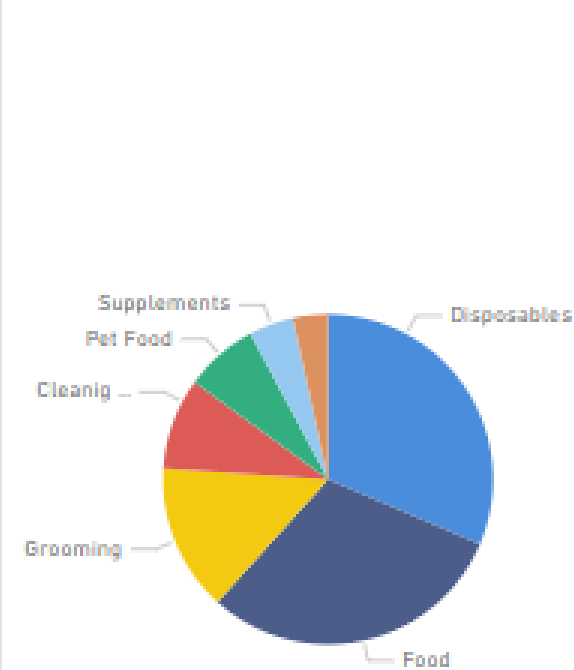
Total income by Year



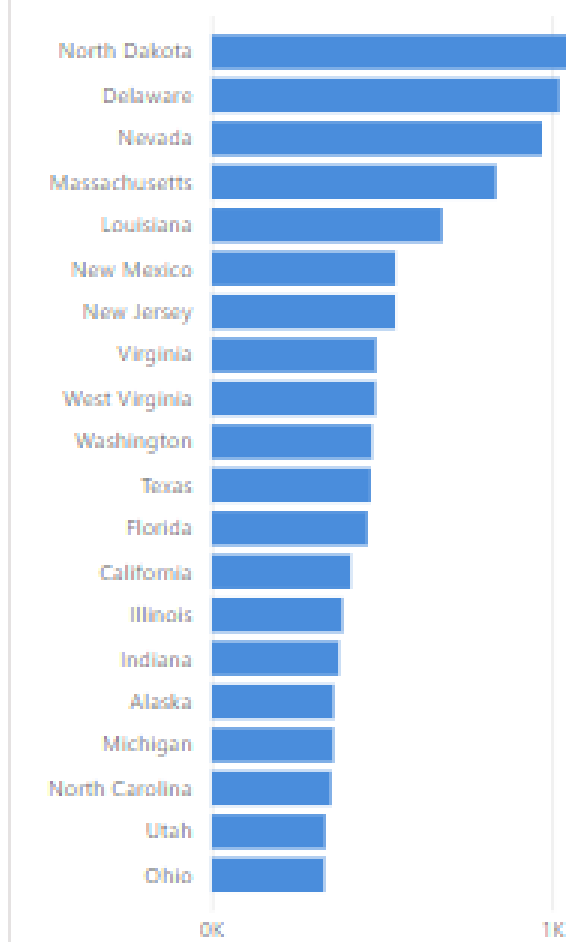
Sold units by Year



Sold units by Category



Customer LTV by State



Customer Metrics and Segmentation

Customer Count Calculation

The total number of unique customers is tracked using the Customer ID from the fact_sales table.

```
Customer Count =  
DISTINCTCOUNT(fact_sales[Customer ID])
```

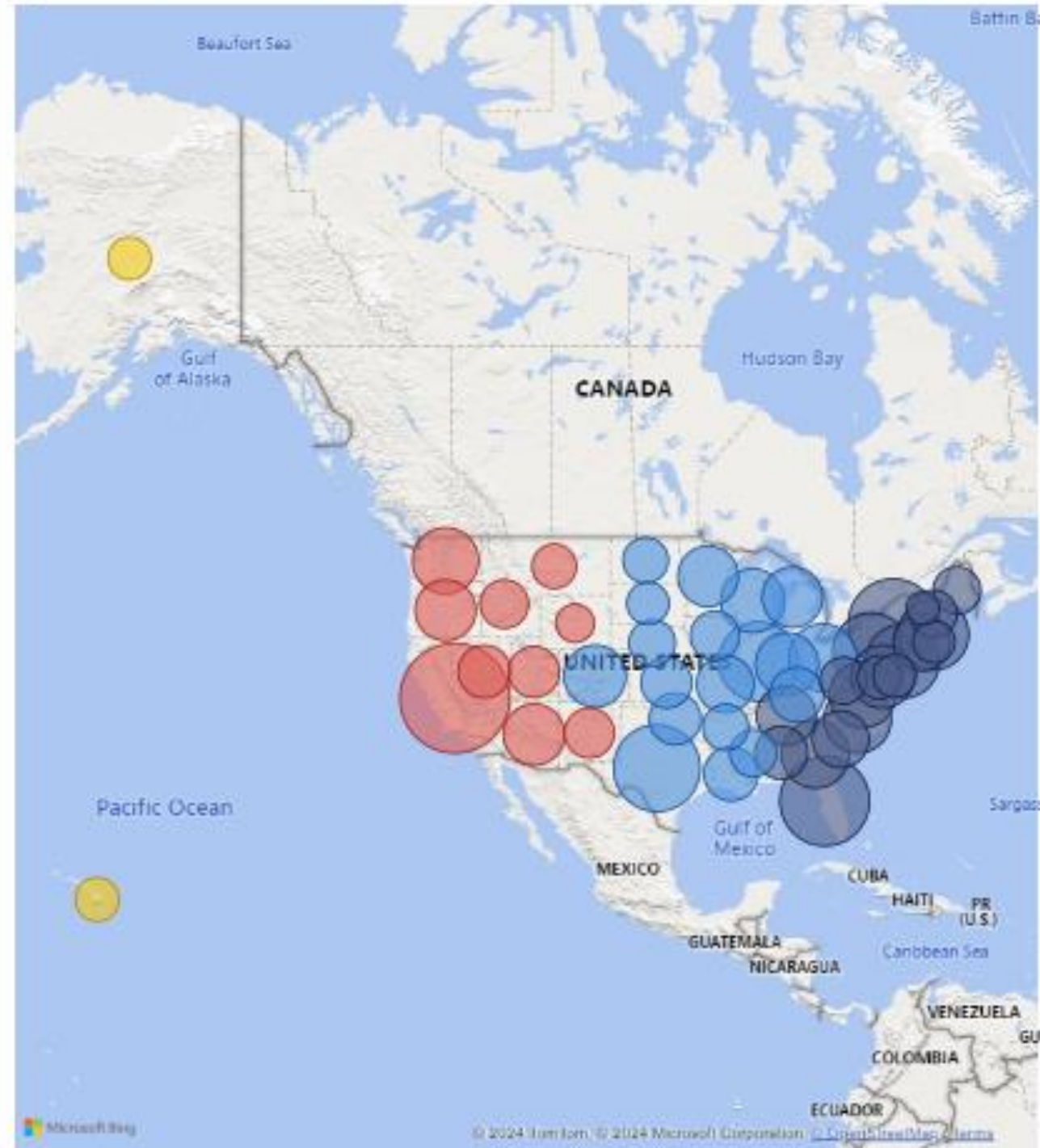
Customer Segmentation

Customers are segmented based on attributes from the dim_customers table, such as geographic region and purchase behavior.



Distinct Count of Customer by State and Region

Region ● Central ● East ● Other ● West



\$1.53M

Total income



\$1.2M

Total Cost



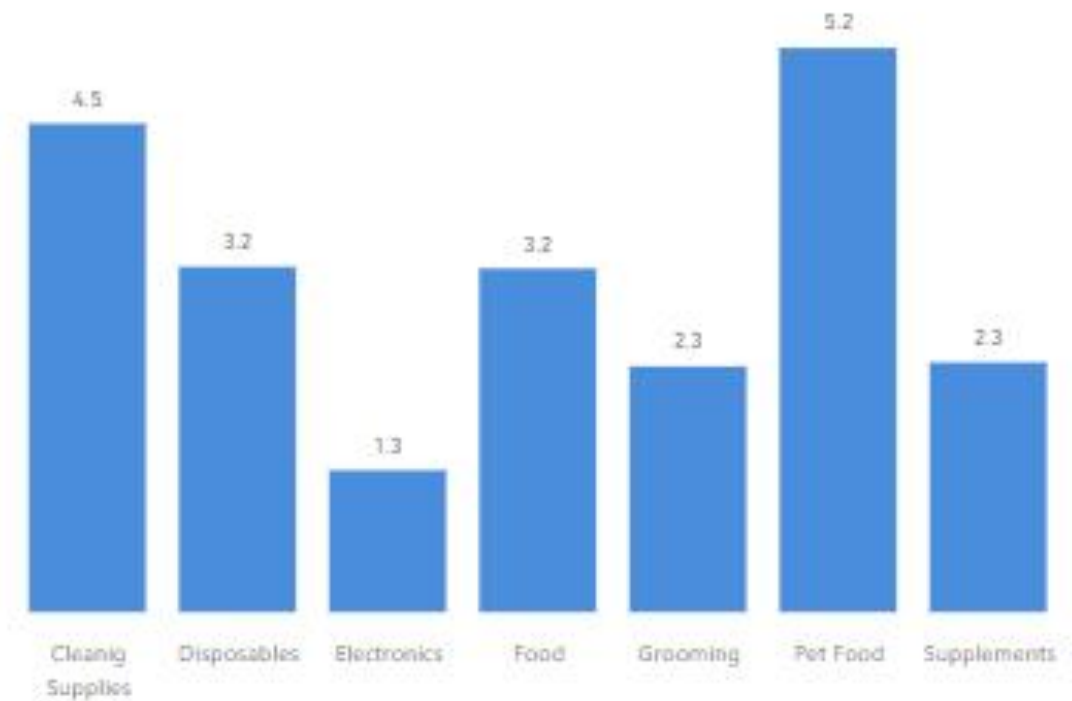
\$335.81K

Total Profit

Region

- ☐ Central
- ☐ East
- ☐ Other
- ☐ West

Average Quantity by Category



Profitability Analysis

Item-Level Profit Calculation

Profit per item is calculated by subtracting both landed cost and shipping cost from the sales price.

```
Item Profit =  
fact_sales[Quantity]  
* (fact_sales[Unit  
Price] -  
RELATED(dim_products[  
Landed Cost])) -  
RELATED(dim_products[  
Shipping_Cost_1000_mi  
le]))
```

Total Profit

The total profit for the business is the sum of the profits from all sales transactions.

Profit Margin %

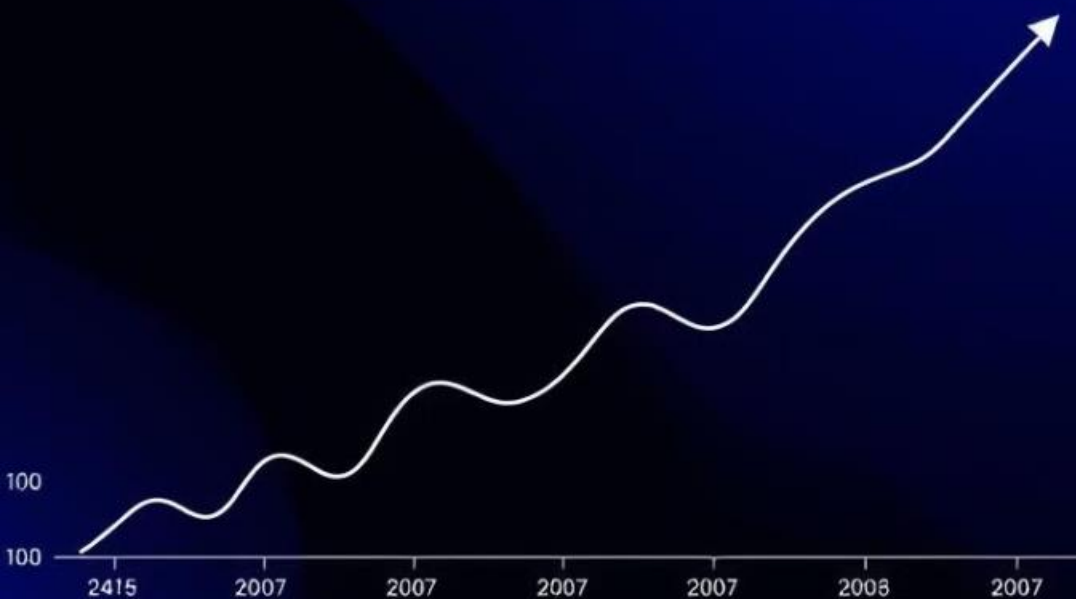
We calculate the profit margin to understand how much profit is made per dollar of sales.

```
Profit % =  
DIVIDE([Total  
Profit],  
SUM(fact_sales[Sales]  
), 0) * 100
```

Profit by Customer

We also track how much profit is generated by individual customers or customer segments, which helps in identifying high-value customers.

Yearly Performance Distribution



1

Seasonality in Sales

The CALENDAR function helps track sales and profit over time to identify seasonal trends.

2

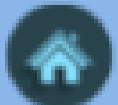
Profit and Shipping Trends

Analyzing profits and shipping costs by month reveals patterns such as higher costs during peak sales seasons.

3

Customer Growth Over Time

The dim_customers table is linked to sales to show how the customer base grows over time.



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75K

Sold units



11K

#Customers



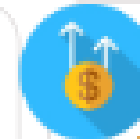
\$1.53M

Total income



\$1.2M

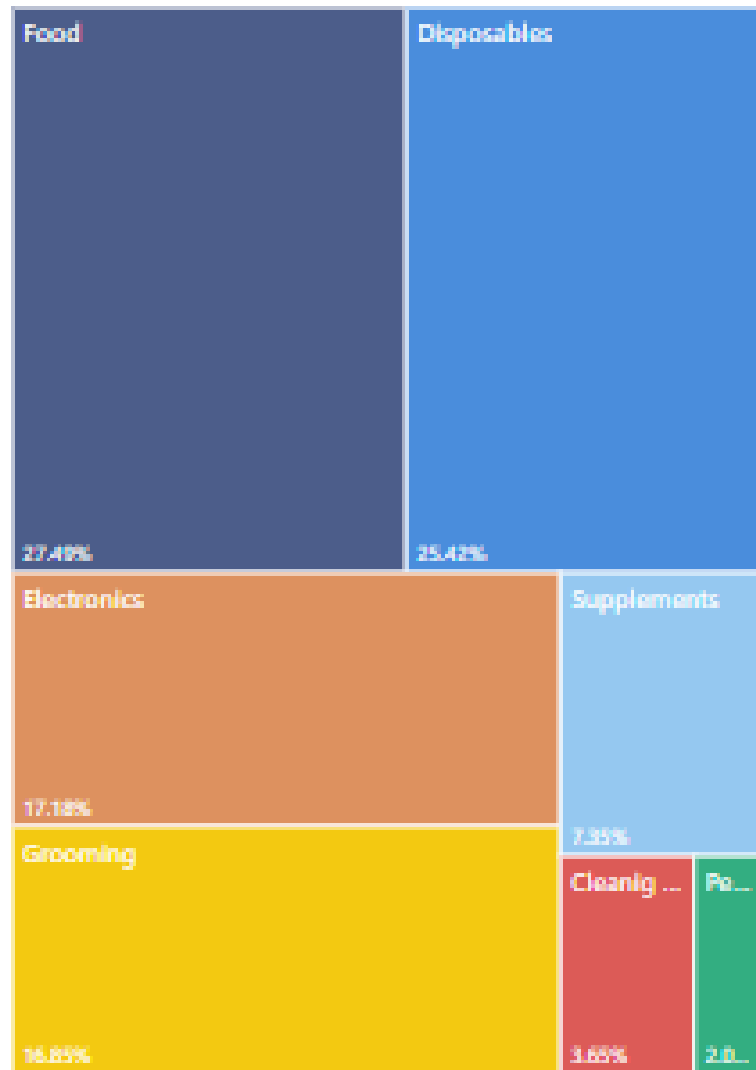
Total Cost



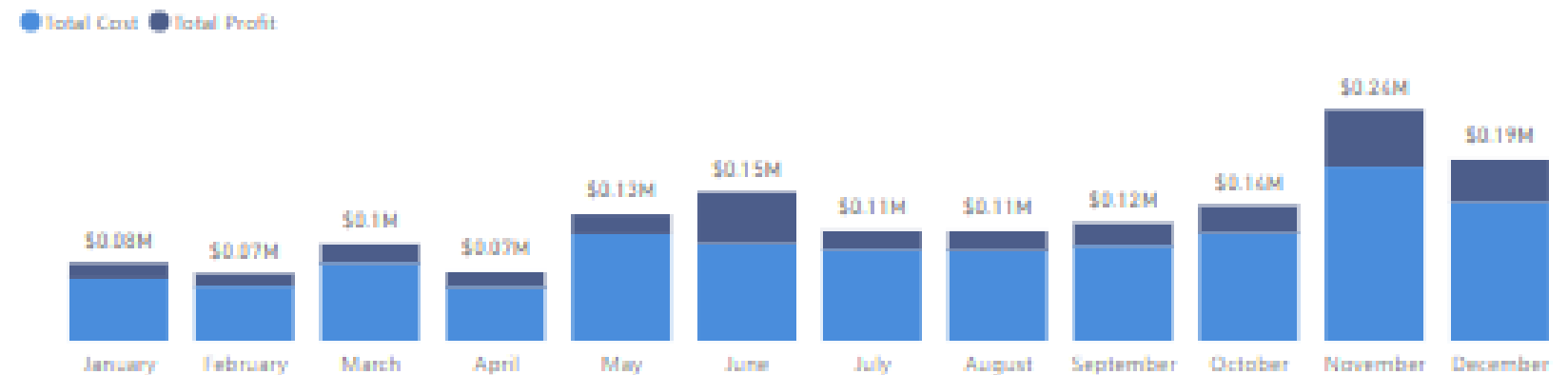
\$335.81K

Total Profit

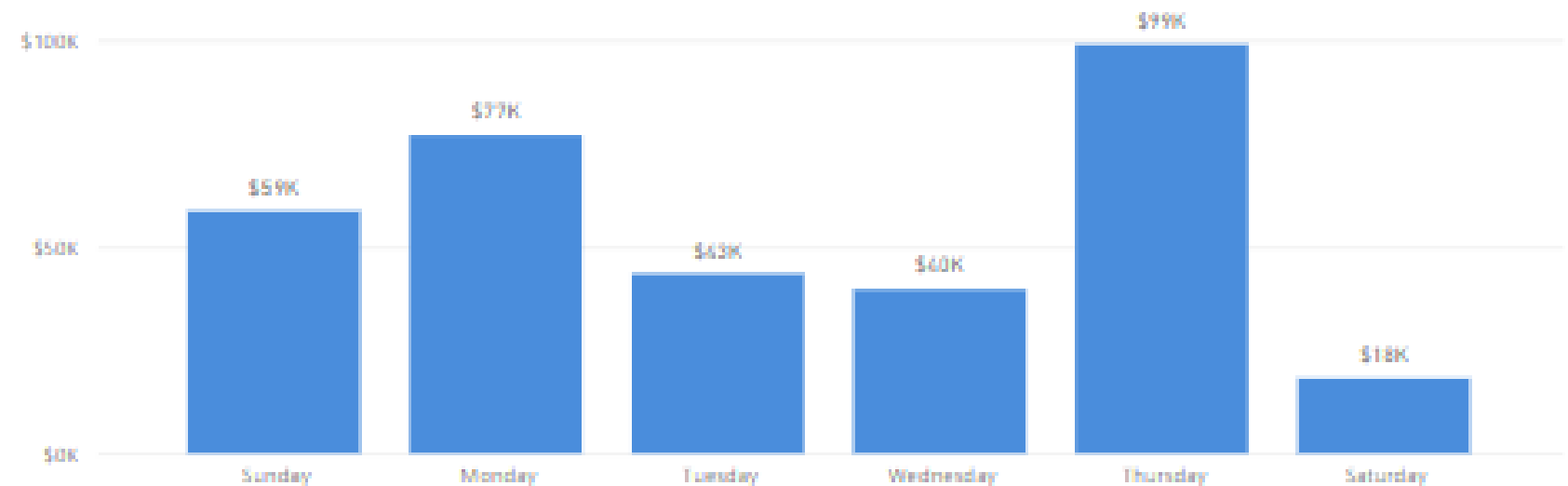
Profit % by Category

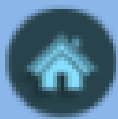


Total Cost and Total Profit by Month Name



Total Profit by Day of Week





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75K

Sold units



3146

Distinct Count of Customer



\$1.53M

Total income



307.80K

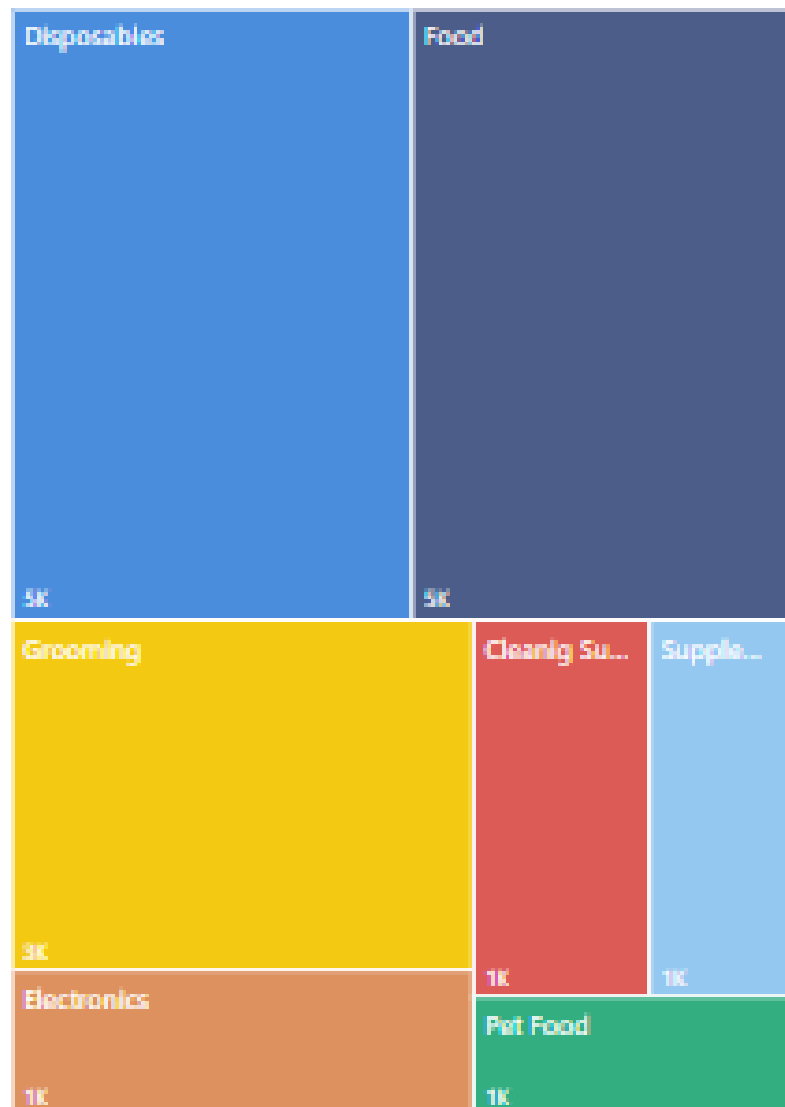
Total Weight



11K

#Invoice

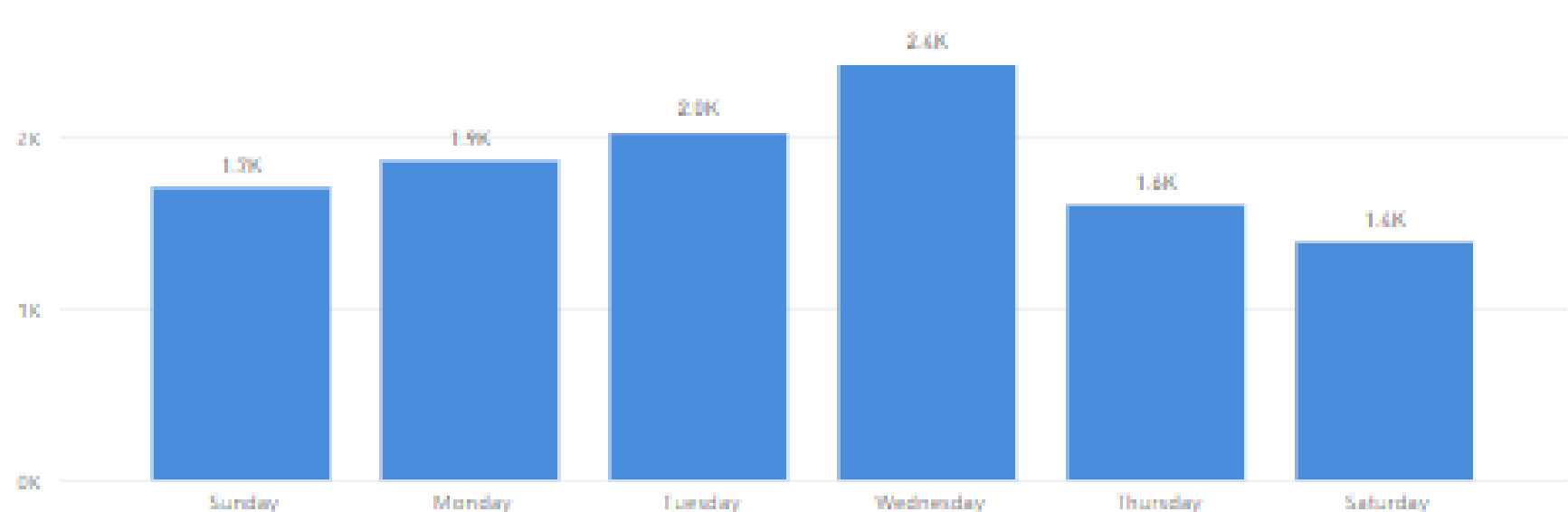
#Customers by Category



#Customers by Month Name



#Customers by Day of Week



Shipping Cost Optimization

Baseline Shipping Cost

Baseline shipping cost is calculated based on the quantity of items shipped. For larger quantities, the per-unit shipping cost is reduced.

```
Shipping (Baseline) =  
SUMX(fact_sales,  
IF(fact_sales[Quantity] = 1,  
RELATED(dim_products[Shipping_  
Cost_1000_mile])),  
RELATED(dim_products[Shipping_  
Cost_1000_mile])) +  
(((fact_sales[Quantity] - 1)  
*(RELATED(dim_products[Shippin  
g_Cost_1000_mile]) * 0.7))))
```

What-If Scenario for Shipping Cost

A "What-if" analysis allows us to simulate different shipping cost scenarios for bulk orders. The Blended Shipping Cost Factor is applied to account for bulk discounts.

```
Blended Shipping Cost Factor =  
IF('What-if  
quantity'[Value]<=1, 1,  
IF(..., 0.3))
```

Shipping Cost Impact on Profit

By adjusting the shipping cost for larger orders, we can see how these changes impact overall profitability. Optimizing shipping strategies can drive significant cost savings, particularly for high-volume orders.

Product Count and Shipping Impact

Correlation Between Product Count and Shipping Cost

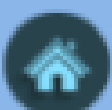
As product quantity increases, shipping costs often decrease on a per-unit basis, leading to improved profit margins for bulk orders.

Key Insight

Larger orders benefit from economies of scale, reducing shipping costs per unit and increasing the overall profitability of those orders.

Analysis of Shipping Cost Trends

By tracking shipping costs across different product counts and orders, the business can optimize its logistics strategy to ensure cost-efficiency in both small and bulk orders.



What-if quantity

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20



381.32K

Shipping (Baseline)



268.86K

Shipping (What-if)



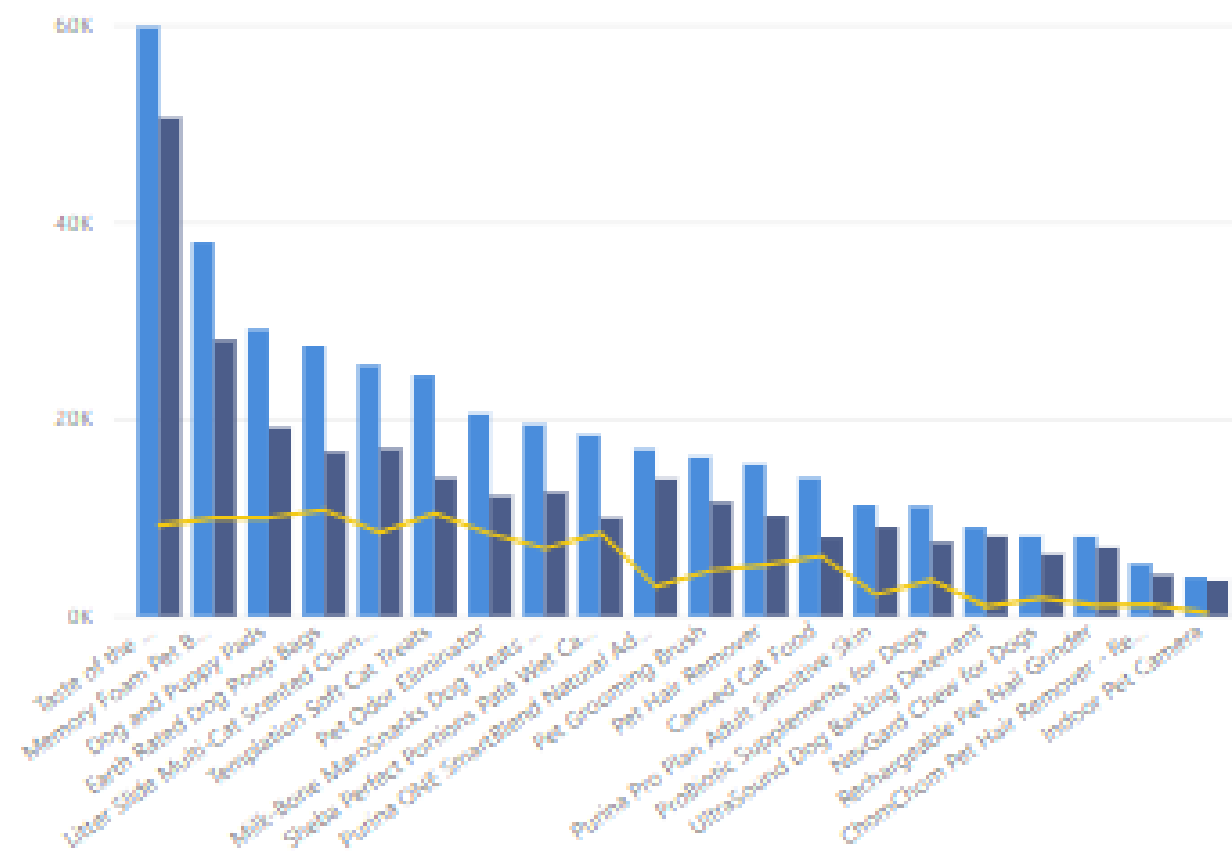
112.46K

Shipping (Difference)



Shipping (Baseline), Shipping (What-if) and Shipping (Difference) by Description

Shipping (Baseline) Shipping (What-if) Shipping (Difference)



Baseline Running Total, What-if Running Total and Difference Running Total by Year and Mo...

Baseline Running Total What-if Running Total Difference Running Total

