



Team Project – 467

DATA WAREHOUSING

Group Members

1. Obsa Abate – M80008301
2. Khaled Alhanaee - 201813959
3. Abdullah Al Hareth - 201932567

Submitted to Dr. Joao Negreiros

Zayed University, April 2023



Report

This report outlines the design of a data warehouse model for a company's order management system. The data warehouse model includes a fact table for Order with various measures such as Sales, Profit, Discount, and Quantity, and also includes several dimension tables, including Customer, Ship, Region, and Product.

The design of this data warehouse model aims to provide a comprehensive view of the company's order management system and enable top managers to make informed business decisions. The granularity of the fact table is at the order level, which means each row in the fact table represents a unique order with all relevant information.

Attributes and Grain:

The fact table, Order, has the following attributes:

- Order ID: Unique identifier for each order
- Order Date: Date when the order was placed
- Ship Date: Date when the order was shipped
- Discount: Discount applied to the order
- Sales: Total sales amount for the order
- Profit: Profit generated from the order
- Quantity: Number of products ordered
- Product ID: Unique identifier for each product
- RegionID: Unique identifier for each region
- CustomerID: Unique identifier for each customer
- ShipID: Unique identifier for each ship

The grain of the fact table is at the order level, which means each row in the fact table represents a unique order with all relevant information.

The dimension tables have the following attributes:

Customer: Customer Name, Segment

Ship: Ship Mode

Region: City, Country, Region, Longitude, Latitude

Product: Sub-Category, Category, Product Name

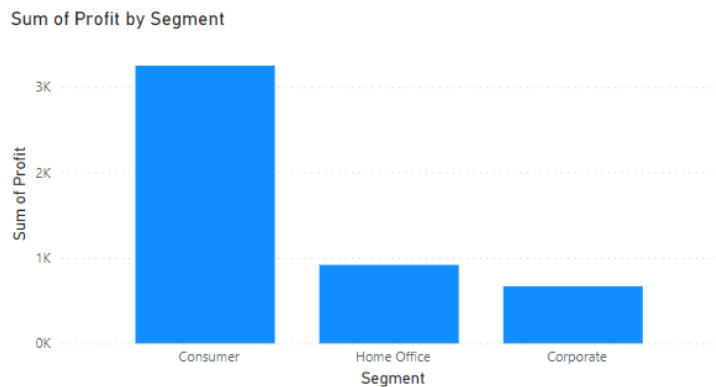
These dimension tables are used to provide additional context to the data in the fact table and enable analysis at different levels of granularity. For example, the customer dimension table can be used to analyze sales and revenue by customer segment, and the product dimension table can be used to analyze sales and revenue by product category and sub-category.

Strategic Questions

Top managers may have various strategic questions that they would like to answer using the data warehouse model. Some of these questions are given below.

Questions

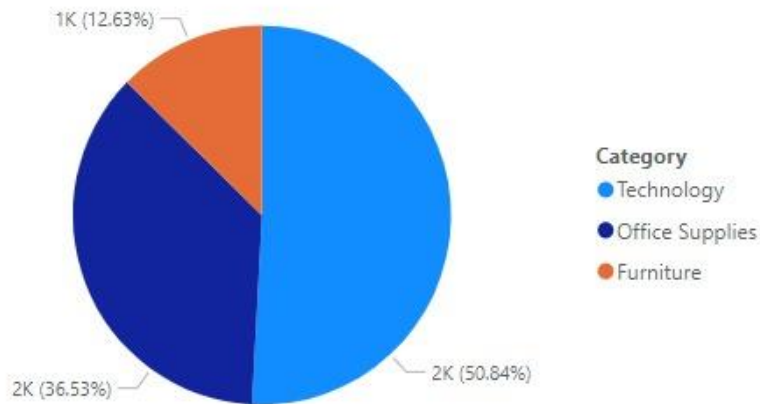
1. Which customer segment is the most profitable?



As it can be observed from the graph, consumer segment is the most profitable, then the company should consider focusing more of their marketing and sales efforts towards this segment. This could include developing targeted advertising campaigns, offering promotions or discounts to consumers, or developing new products specifically tailored to this segment. Based on the analysis of profitability across different customer segments, the company may want to consider developing new products or services that specifically target underperforming segment. For example, Corporate segment is the least profitable, so the company could consider developing new products or services that better meet the needs of corporate customers.

2. What is the profitability of the company's products, and which products generate the most profit?

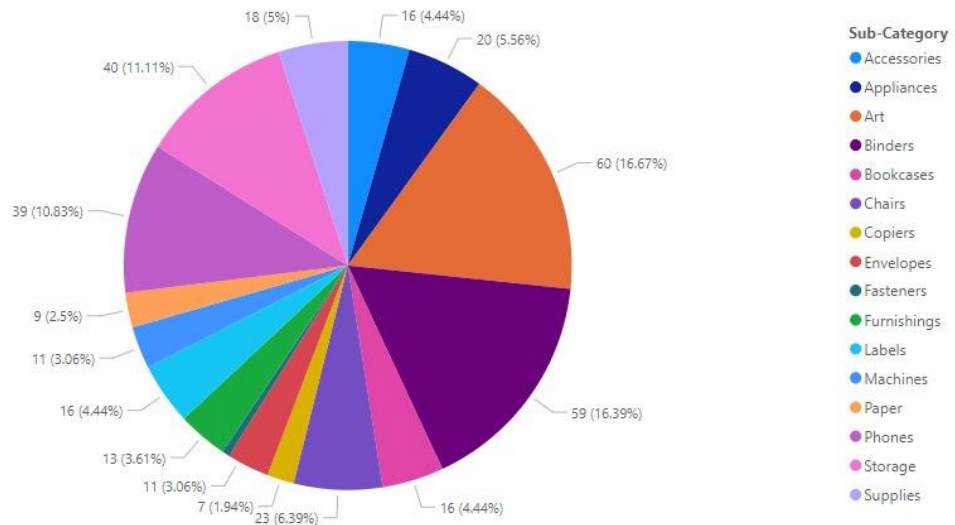
Sum of Profit by Category



Given that technology products generate the most profit for the company, it may be worthwhile to shift focus towards this category. This could include increasing investment in research and development to develop new and innovative technology products, or expanding the company's existing technology product line to include more products that meet the needs and preferences of customers. While furniture products represent a smaller portion of the company's overall profit, it may still be important to review pricing strategies for this category to ensure that prices are competitive and in line with customer expectations. The company could also consider developing new marketing strategies to promote furniture products and increase sales.

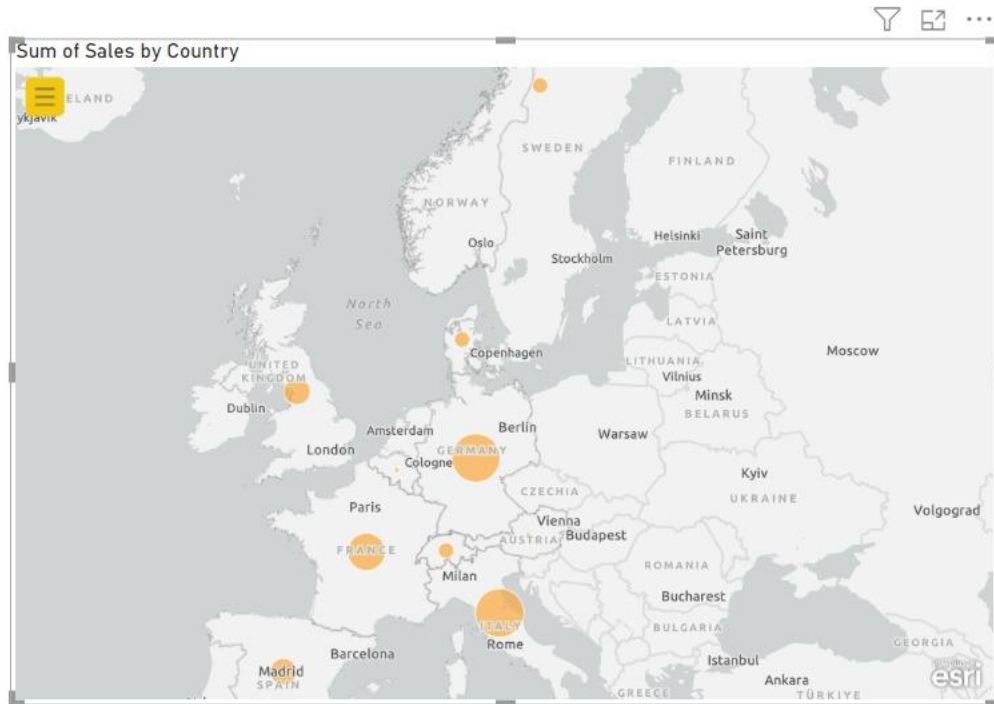
3. Which product sub-categories are sold the most and the least in terms of volume?

Sum of Quantity by Sub-Category



"binders" are the most sold sub-category in terms of volume, while "fasteners" are the least sold sub-category, there are several potential future decisions and actions that could be taken by the company. As the "binders" are the most sold sub-category, the company may want to consider increasing production and inventory levels to meet customer demand. This could involve investing in new equipment or hiring additional staff to increase production capacity. Moreover, "fasteners" are the least sold sub-category, the company may want to review its marketing and promotion strategies for this product category. This could involve developing new marketing campaigns or promotions that highlight the unique features and benefits of "fasteners", or targeting specific customer segments that may be more likely to purchase these products.

4. What is the total quantity of products ordered by cities, and which countries have the highest quantity of orders?



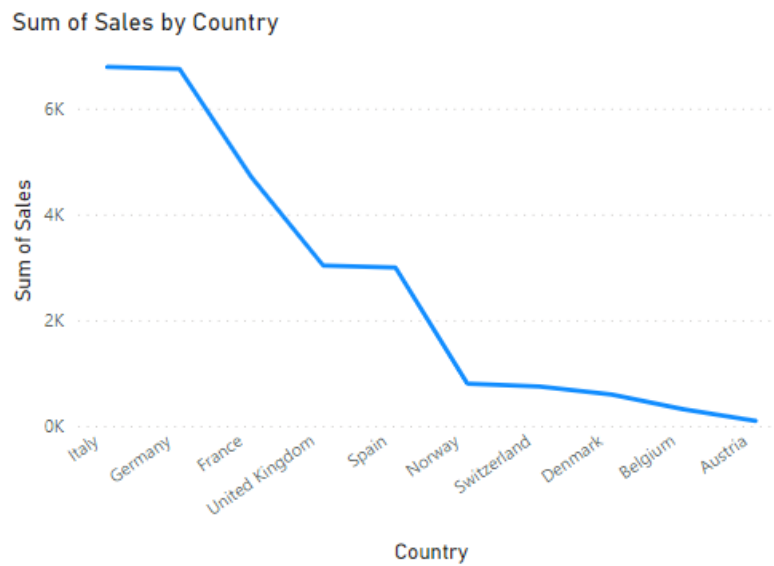
To ensure timely delivery of products to customers in these countries, the company may need to improve supply chain management processes. This could involve working with suppliers to improve delivery times, optimizing inventory management to ensure that products are available when customers need them, or investing in new technology to improve supply chain visibility and coordination. Italy, Germany, France, and the United Kingdom are currently the countries with the highest quantity of orders, the company can explore new market opportunities to diversify its customer base and reduce dependence on a few key markets. This could involve conducting market research to identify new regions with high growth potential, or developing new products that are tailored to the needs of customers in different markets.

5. What is the total quantity of products ordered by ship model, and which ship models are most commonly used?



With that the high volume of orders using the Economy ship model, the company may want to consider ways to improve delivery times to customers. This might include optimizing supply chain management processes, working with shipping providers to improve delivery times, or investing in new technology to track and coordinate deliveries more effectively. Given the popularity of the Economy ship model, the company may consider adjusting pricing for products that are commonly shipped using this model. This could involve offering discounts for products that are shipped using other models, or adjusting pricing for products that are frequently shipped using the Economy model to reflect the higher demand.

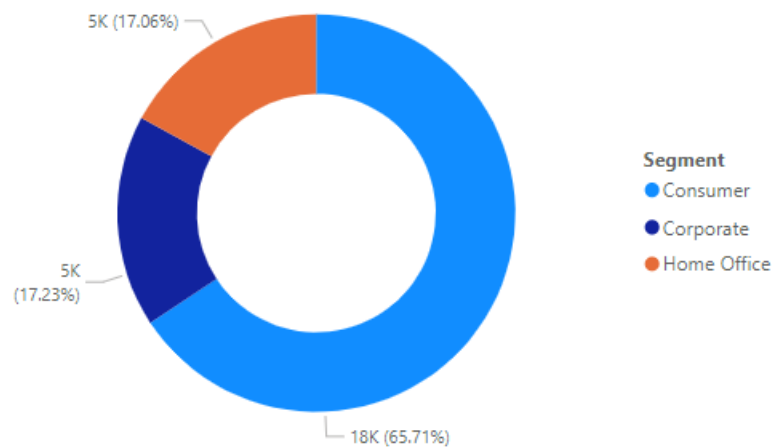
6. What is the total sales amount generated by country, and which countries have the highest sales?



The company should pay special attention to Italy, Germany, France, and the United Kingdom, as these countries have the highest sales amounts. They can also investigate why Austria has the lowest sales and take corrective actions if necessary, such as developing targeted marketing campaigns or adjusting their pricing strategy for that market. By understanding which countries are driving the most sales, the company can make informed decisions about future investments, such as expanding their distribution channels or increasing their advertising spend in those regions.

7. Who has made the most product purchases?

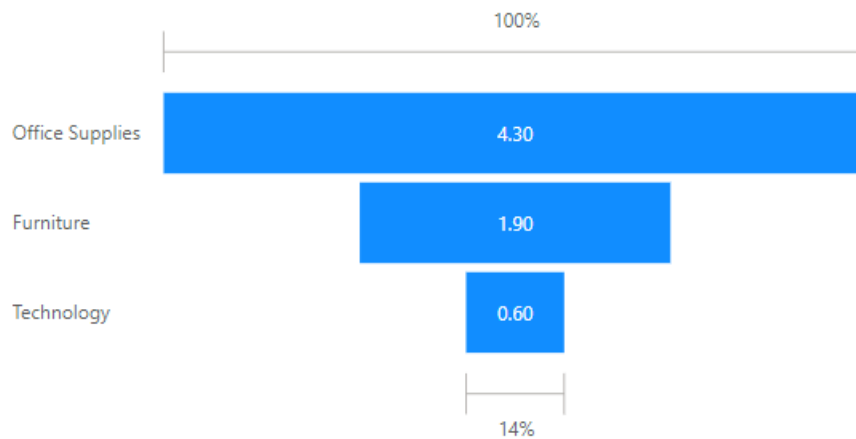
Sum of Sales by Segment



It appears that consumers have made the most product purchases, followed by home office and corporate customers. The company can use this information to tailor their marketing and sales strategies to better appeal to these customer segments. They can also investigate why corporate customers are purchasing fewer products and take actions to better understand their needs and preferences.

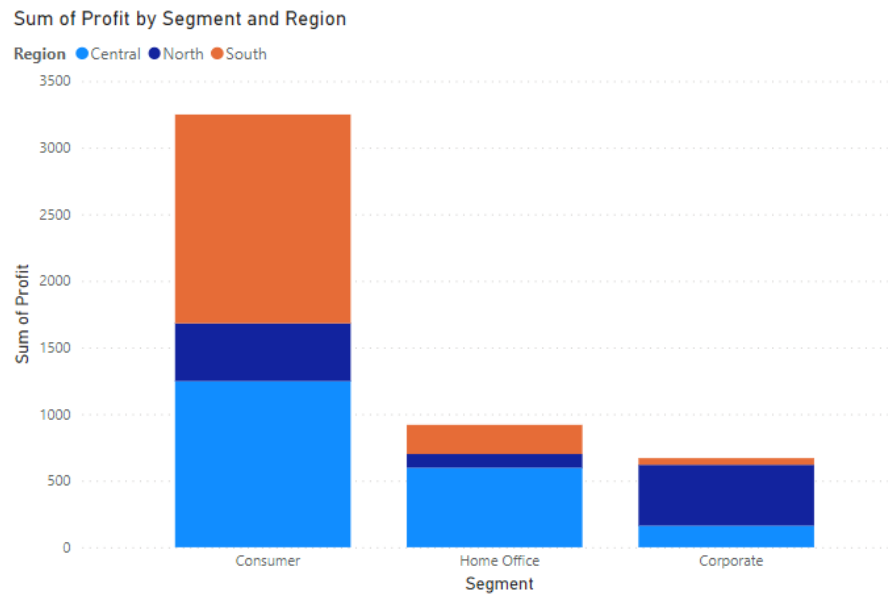
8. What is the total discount amount given by product category, and which categories have the highest discounts?

Sum of Discount by Category



In this case, the office supplies category has the highest discount rate, followed by furniture and technology. They may continue offering more discounts for office supplies to maintain the high sales volume from this category. Additionally, they can investigate why certain categories require higher discounts and take actions to reduce their cost of production or optimize their supply chain to offer more competitive prices.

9. Which regions and customers are driving the most revenue for the company?



The Consumer segment in the south region are driving the most revenue; the company can focus on increasing their marketing efforts in this region and segment to attract more customers and increase sales. They can also consider expanding their product offerings in this region to capitalize on the high demand. Corporate segment in the south region are generating less revenue compared to other regions and segments, the company can investigate the reasons behind this and take corrective actions. For instance, they may want to improve their customer service for the Corporate segment or offer more promotions to increase sales in the South region for the particular segment.

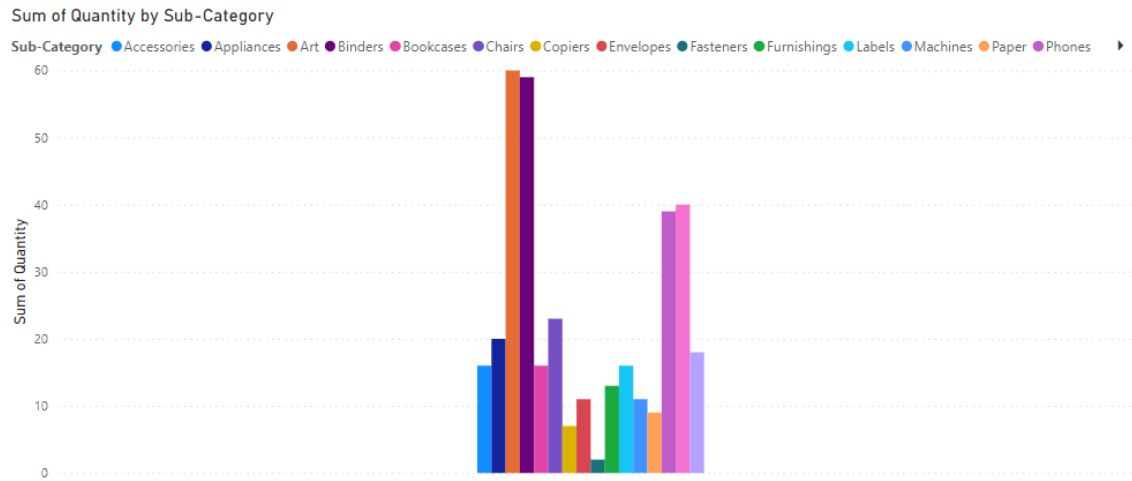
10. What is the total sales amount generated by each product category purchased by customer segment?

Segment	Sum of Sales
<input type="checkbox"/> Consumer	17625
Furniture	2535
Office Supplies	6558
Technology	8532
<input type="checkbox"/> Corporate	4621
Furniture	974
Office Supplies	2313
Technology	1334
<input type="checkbox"/> Home Office	4577
Furniture	722
Office Supplies	2257
Technology	1598
Total	26823

This information can be used to allocate resources and marketing efforts to the most profitable areas, such as increasing advertising spend in the technology category for the consumer segment.

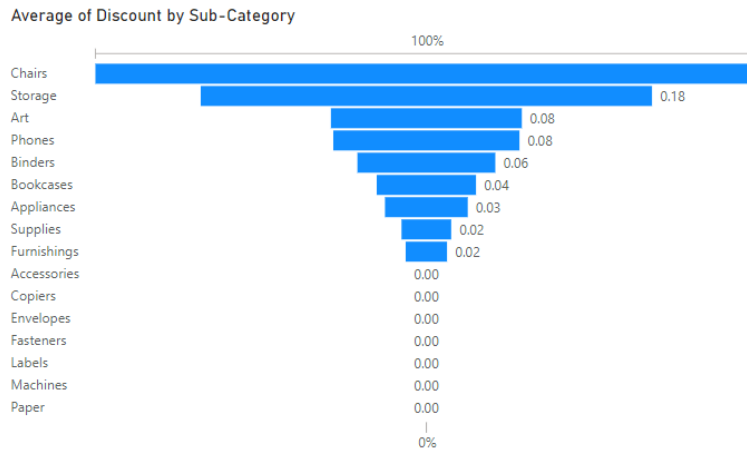
It can also help the company to identify potential areas for improvement, such as the low sales of furniture to the home office segment. The company may investigate why this is happening and consider adjusting their product offerings or marketing strategies to better target the home office segment.

11. What are the top 5 product sub-categories to be purchased?



Based on the data provided, the top 5 product sub-categories to be purchased are Art, Binders, Storage, Phones, and Chairs. This information is crucial for the company as it provides insights into which products are in high demand and which products need to be stocked up more frequently. On the other hand, the company should also pay attention to the least purchased product sub-categories, such as fasteners and copiers. These products may not be generating significant revenue for the company, and it may not be worth the effort to produce and market them. Instead, the company can explore other product categories that are in high demand or invest in R&D to create new products that meet customer needs.

12. What is the average of discount on each product sub-category?



By understanding the discount trends for each product sub-category, managers can identify which products are being sold at higher discounts than others and assess whether this is impacting profitability. This information can be used to optimize pricing strategies for each product sub-category. For example, if a particular product sub-category is consistently being sold at high discounts, managers can evaluate whether it would be more profitable to adjust the pricing of that sub-category to reduce the need for discounts.