refocus

Visualization in Power BI: Final Task

Home Assignment for Submission

Analysis of the operating performance for ecommerce company

This task needs to be submitted for review. Read the task description and follow the steps below to complete the assignment.

Task description

You work in a consulting group. Your client, an e-commerce company from Brazil, has requested a complete analysis of their operating performance. They want a detailed report covering three main parts: general dashboard, delivery performance, and product quality. Based on this analysis report, the company's management will decide the future development of the business.

The dataset contains information on 100k orders from 2016 to 2018 made at several marketplaces in Brazil. Various order data are recorded: from order status, price, payment, and freight performance to customer location and product attributes. Also, you have access to customer reviews. The geolocation dataset relates Brazilian zip codes to latitude/longitude coordinates.

It is actual commercial data that has been made anonymous; references to the companies and partners in the review text were replaced.

What you need to do

Task 1 (Import Data)

1 **Download the** <u>Dataset</u>.

2 **Import data** to the PowerBI.

Task 2 (Data cleaning and transformation)

1 **Replace blank values** and **drop duplicates** (if they are in the data).

2 **Add geolocation** to customers and buyers.

Task 3 (Data modeling)

1 **Create a data model** that will represent the relationship between datasets.

2 After creating a data model, **change the cross filtering direction to "Both"** in order to create indirect relationships from tables who didn't have direct connection.

Task 4 (Building a general dashboard)

1. Use the existing page in the report view and **name it as "General Dashboard"**.

2. Investigate the **company's production volume, sales, and customer product ratings.**

Task 5 (Exploring delivery performance)

1. **Create a new page in the report view and name it as "Delivery Performance".**

2. Walk through the delivery performance, and find **ways to optimize delivery times.**

   ✔ Optimizing delivery times is a great way to ensure that our customers get the packages on time. To do this, you'd need to find out which of the parties are causing the most delay in the deliveries.

3 **Calculate DAX measures** for the seller's late dispatch and courier's late delivery.

4 Here are the **DAX columns and measures you can calculate and use in your visuals:**

- ✓ Difference between purchase and approval in minutes.

- ✓ Difference between approval to deliver to customers in days.

- ✓ Difference between delivered to customer and estimated delivery in days.

- ✓ If the package was delivered later than the estimated delivery date, then it's late.

- ✓ Difference between delivered to the carrier and estimated delivery in days.

- ✓ If the package was sent to the carrier later than the estimated delivery date, then it's a seller's late dispatch. If the package was sent to the carrier 5 or more days earlier than the estimated delivery date but the delivery date to the customer is later than the estimated date, then it's a carrier's delay.

5 **Provide a written comment** with your insights and recommendations.

Task 6 (Investigating product quality)

1. Create a new page in the report view and name it as "Product Quality".

2. Discover **product categories that are more prone to customer dissatisfaction.**

3. **Calculate DAX measures for bad reviews (**those less than 3), and build a time series visualization.

In the end:

✔ **Save the document as .pbix file and archive it before uploading it to the learning platform.** If you not sure how to save the file properly, use this guide. If you not sure how to archive the file properly, use this guide.

Completion criteria

Use this checklist before assigning the hometask to check if everything is done.

☐ The submitted .pbix file contains three dashboards (one dashboard for each task) named General Dashboard, Delivery Performance and Product Quality.

☐ The following elements appear at least once in the dashboards: bar or column chart, combination chart, scatter chart, map, and slicers.

☐ My measure calculations are correct and placed on the dashboard.

☐ The data model is correctly built on multiple datasets.

☐ **The document is saved as .pbix file, archived and uploaded to the learning platform.**

E-Commerce Sales Performance Dashboard

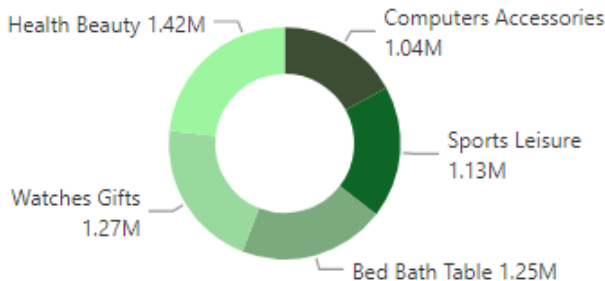## Total Sales
16.01M

Total Products Sold
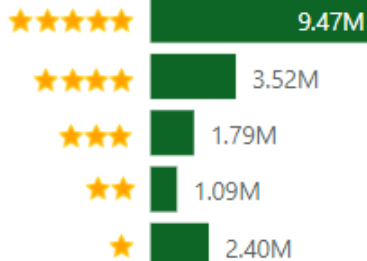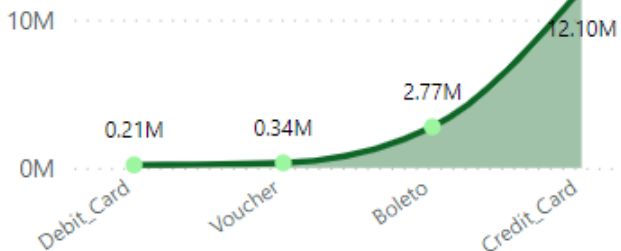**103.88K**

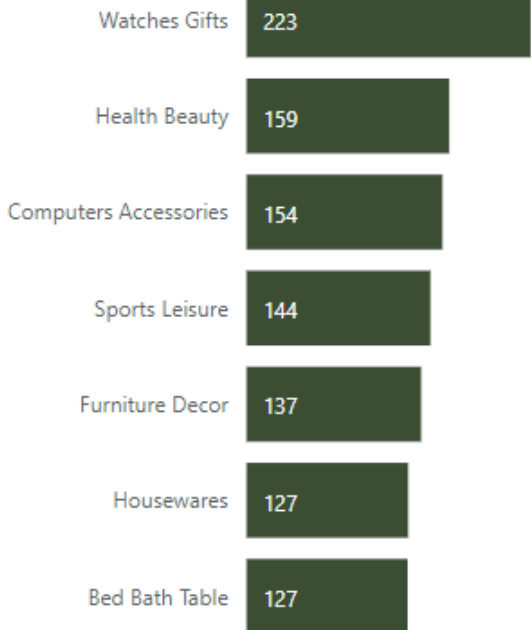## Average Sales
154.10

Top 5 Product Categories in Revenue

- Health Beauty 1.42M
- Computers Accessories 1.04M
- Sports Leisure 1.13M
- Bed Bath Table 1.25M
- Watches Gifts 1.27M

Total Sales by Review Rating

Rating	Sales
★★★★★	9.47M
★★★★	3.52M
★★★	1.79M
★★	1.09M
★	2.40M

Total Sales by Payment Method

Payment Method	Total Sales
Debit_Card	0.21M
Voucher	0.34M
Boleto	2.77M
Credit_Card	12.10M

Average Sales of Top 7 Products Sold by Category

Category	Average Sales
Watches Gifts	223
Health Beauty	159
Computers Accessories	154
Sports Leisure	144
Furniture Decor	137
Housewares	127
Bed Bath Table	127

Total Monthly Sales and Products Sold

- Total Sales ● Total Products Sold

Month	Total Sales	Total Products Sold
January	1.21M	7.8K
February	1.24M	8.2K
March	1.54M	9.5K
April	1.52M	9.1K
May	1.70M	10.3K
June	1.50M	9.2K
July	1.59M	10.0K
August	1.63M	10.5K
September	0.70M	4.2K
October	0.80M	4.7K
November	1.15M	7.3K
December	0.84M	5.5K

Total Yearly Revenue

- Total Sales ● Average Sales

Year	Total Sales	Average Sales
2016	0.0M	163
2017	6.5M	151
2018	8.7M	154

Top 7 Products Sold by Category

Category	Products Sold
Watches Gifts	5.7K
Housewares	6.1K
Furniture Decor	6.6K
Computers Accessories	6.8K
Sports Leisure	7.8K
Health Beauty	8.9K
Bed Bath Table	9.9K

Analysis and Insights from Sales Performance Dashboard

1. Total Revenue: The company has achieved total sales of $16.01 million.

2. Quantity of Products Sold: The company has sold a total of 103.88 thousand products.

3. Average Sales: The average sales per product is $154.10.

4. Top Product Categories: The Health and Beauty product category leads in sales, generating $1.42 million in revenue, followed by Computer Accessories with $1.04 million in sales.

5. Sales by Product Rating: Products with a 5-star rating contributed $9.47 million in sales, while those with a 1-star rating accounted for $2.40 million in revenue.

6. Credit Card Sales: Sales made using credit cards total $12.10 million.

Analysis and Insights from Sales Performance Dashboard

7. Revenue by Year: In 2017, the company earned $6.5 million in revenue, which increased to $8.7 million in 2018.

8. Top-Performing Product Category: The Watches and Gifts product category stands out with an average sales figure of $223, making it the highest among all product categories.

9. Highest Quantity Sold: The Bed, Bath, and Table product category recorded the highest quantity of products sold, with a total of 9.9 thousand units.

This analysis provides insights into the company's total revenue, product sales, average sales per product, top-performing product categories, sales based on product ratings, credit card transactions, revenue over two years, and standout product categories in terms of sales and quantity sold. These metrics can help the company make informed decisions and tailor its strategies for greater success.
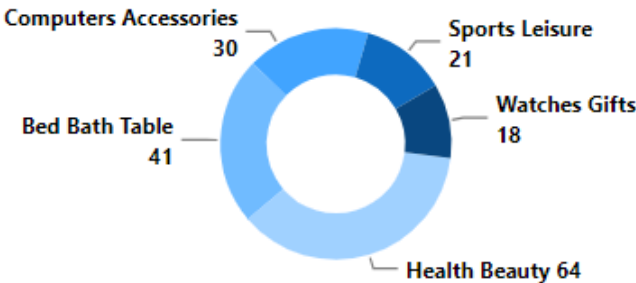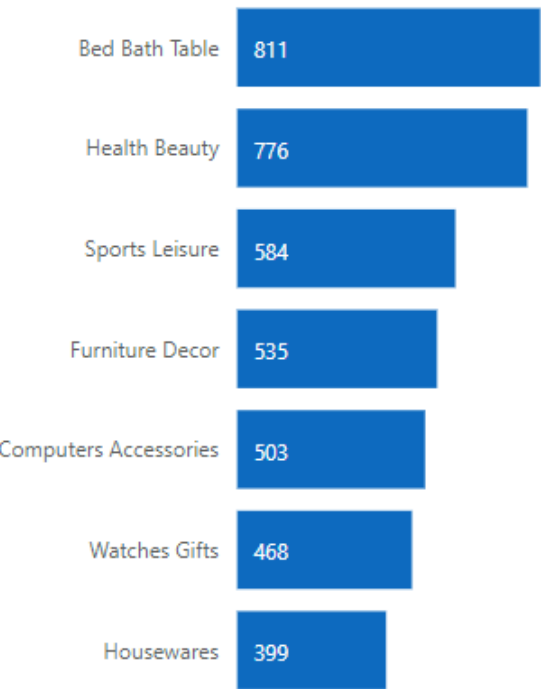
E-Commerce Delivery Performance Dashboard

Total Orders Succesfully Delivered
96456
100.00%

Total Orders Delivered On Time
88630
91.89 %

Total Orders Delivered Late
7827
8.11 %

Top 5 Product Categories Dispatched Late by Seller

- Computers Accessories 30
- Sports Leisure 21
- Watches Gifts 18
- Health Beauty 64
- Bed Bath Table 41

Customer Location

EUROPE
Atlantic Ocean
AFRICA
SOUTH AMERICA
Indian Ocean

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Microsoft Bing   © OpenStreetMap

Top 7 Product Categories Delivered Late

Category	Value
Bed Bath Table	811
Health Beauty	776
Sports Leisure	584
Furniture Decor	535
Computers Accessories	503
Watches Gifts	468
Housewares	399

Average Procurement Cycle Time

9.9 hrs   **2.8** days   **9.3** days

Order Placement   Confirmation   Seller Dispatched   Courier

Total Monthly Products Delivered

● Courier Late Deliveries   ● Seller Late Dispatched

Month	Courier Late Deliveries	Seller Late Dispatched
January	487	33
February	1102	31
March	1638	27
April	542	19
May	684	23
June	204	12
July	409	45
August	799	163
September	217	9
October	240	25
November	1043	62
December	462	16
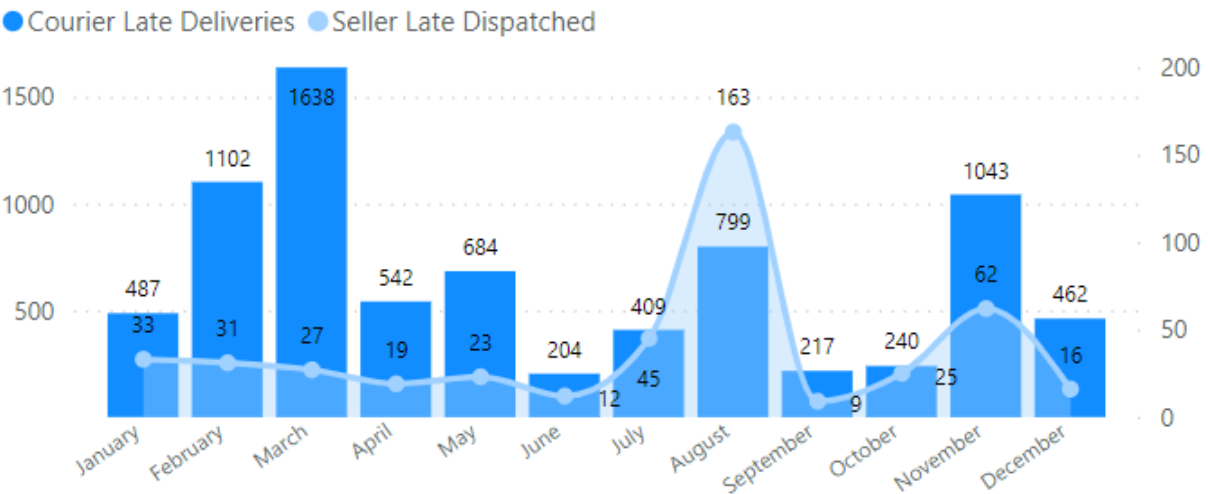
On Time Deliveries and Late Deliveries by Product Category

Late Deliveries (y-axis: 0 to 1000)
On Time Deliveries (x-axis: 0 to 10000)
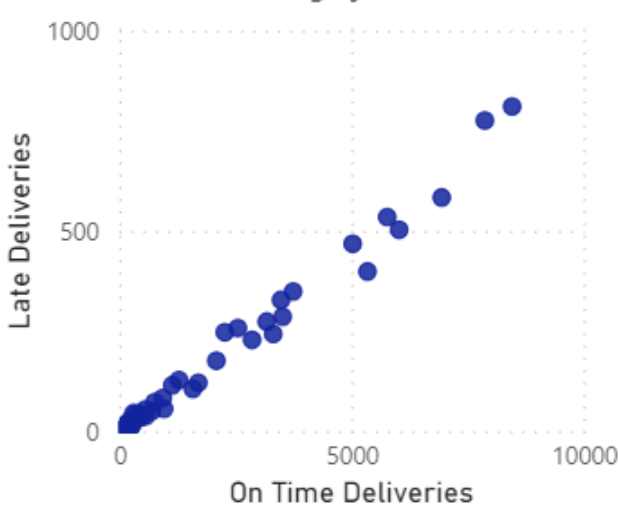
Analysis and Insights from Delivery Performance Dashboard

1. Total Successfully Delivered Orders: The total number of orders that were successfully delivered is 96,456.

2. Percentage of Orders Delivered: Out of the total orders, 88,630 were delivered, which represents a delivery success rate of 91.89%.

3. Late Deliveries: There were 7,827 orders that experienced late deliveries, accounting for 8.11% of the total.

4. Top Product Categories with Seller-Related Late Deliveries: The product categories most frequently associated with late deliveries caused by the seller include:

    A. Health and Beauty with 64 late deliveries

    B. Bed, Bath, and Table with 41 late deliveries

    C. Computer Accessories with 30 late deliveries

    D. Sports and Leisure with 21 late deliveries

    E. Watches and Gifts (number not specified)

Analysis and Insights from Delivery Performance Dashboard

5. Top 7 Product Categories with Late Deliveries: The top seven product categories that experienced late deliveries, regardless of the cause, are as follows:
   A. Bed, Bath, and Table with 811 late deliveries
   B. Health and Beauty with 776 late deliveries
   C. Sports and Leisure with 584 late deliveries
   D. Furniture and Decor with 535 late deliveries
   E. Computer Accessories with 503 late deliveries
   F. Watches and Gifts with 468 late deliveries
   G. Housewares with 399 late deliveries

6. Average Confirmation Time: On average, it takes 9.9 hours for orders to be confirmed.

7. Average Seller Dispatch Time: The average time taken by sellers to dispatch orders after confirmation is 2.8 days.

8. Average Courier Delivery Time: The average duration for couriers to deliver orders is 9.3 days.

Delivery Performance Recommendations

1. **Optimize Supply Chain Management:** Improve supply chain efficiency to reduce late deliveries. Work closely with suppliers and ensure adequate inventory levels to meet demand.

2. **Performance-Based Incentives:** Consider implementing performance-based incentives for sellers, especially in the top product categories with frequent late deliveries. Reward those who consistently meet delivery deadlines.

3. **Enhance Communication:** Enhance communication with customers regarding their orders. Provide real-time tracking information and updates to manage customer expectations and reduce inquiries about late deliveries.

4. **Courier Selection:** Evaluate and potentially renegotiate courier contracts to reduce delivery times. Consider using multiple couriers to provide faster and more reliable delivery options.

5. **Seller Training:** Offer training and resources to sellers to improve their order processing and dispatch times, addressing the root causes of late deliveries.

6. **Data-Driven Insights:** Continuously analyze delivery data to identify patterns and areas for improvement. Use data to make informed decisions about the delivery process.

Product Quality and Review Performance Dashboard

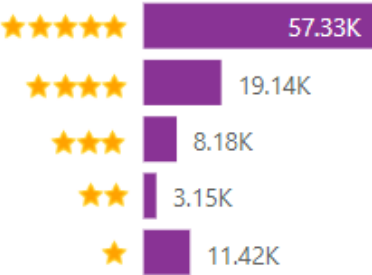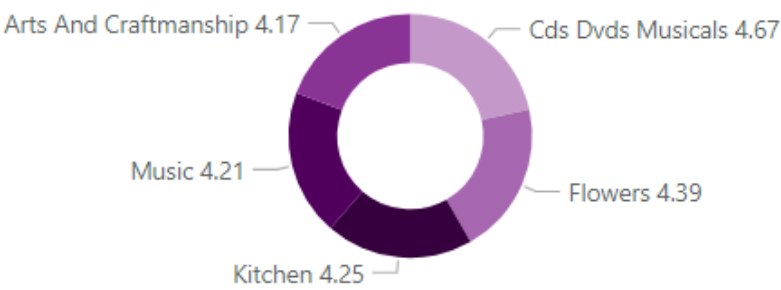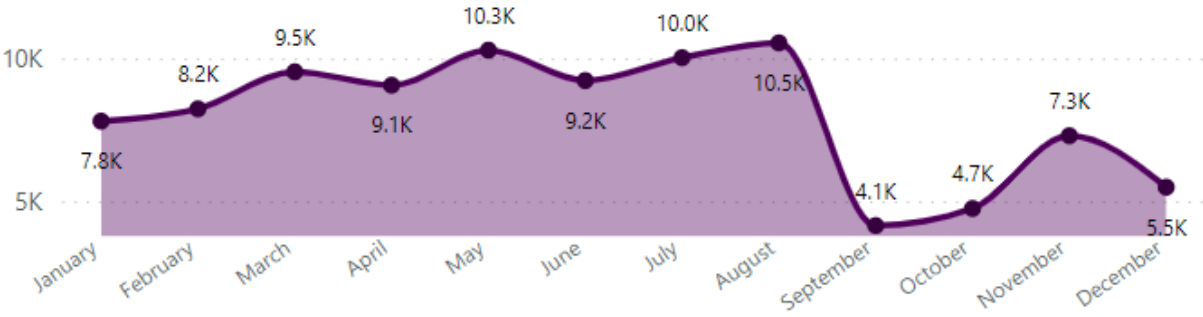## Total Reviews by Rating

★★★★★	57.33K
★★★★	19.14K
★★★	8.18K
★★	3.15K
★	11.42K

99.22K Total Reviews

4.09 AVG Rating

Top 5 Product Categories by Average Review Rating

Arts And Craftmanship 4.17

Cds Dvds Musicals 4.67

Music 4.21

Flowers 4.39

Kitchen 4.25

Total Monthly Reviews

7.8K January
8.2K February
9.5K March
9.1K April
10.3K May
9.2K June
10.0K July
10.5K August
4.1K September
4.7K October
7.3K November
5.5K December

Top 7 Product Categories by Total # of Reviews

Category	Reviews
Bed Bath Table	9.3K
Health Beauty	8.7K
Sports Leisure	7.5K
Computers Accessories	6.5K
Furniture Decor	6.3K
Housewares	5.7K
Watches Gifts	5.5K
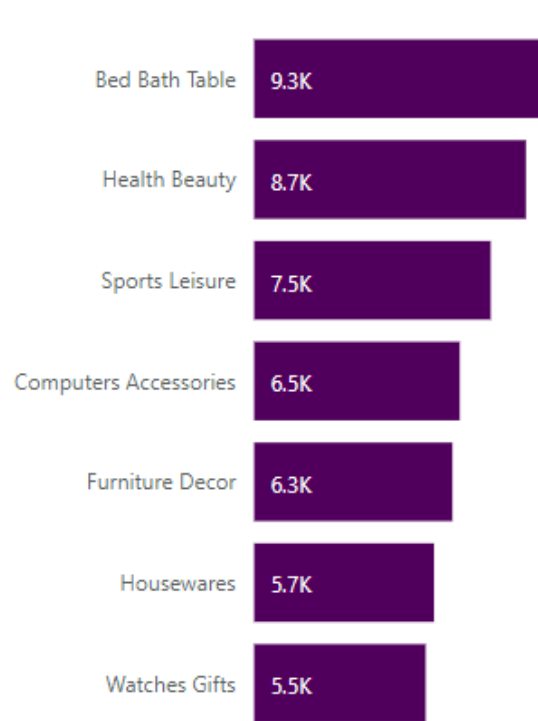
Bottom 5 Product Categories by Total Reviews
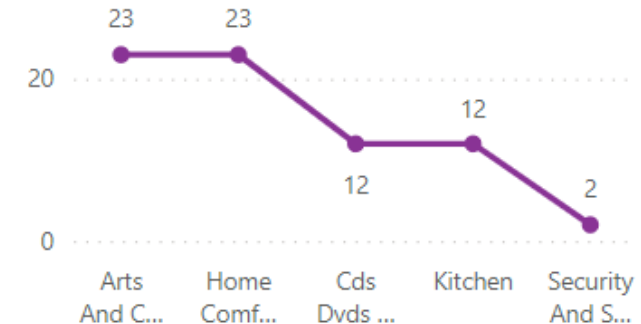
Arts And C... 23
Home Comf... 23
Cds Dvds ... 12
Kitchen 12
Security And S... 2

Bottom 7 Product Categories

● Average Review Rating   ● Total Reviews

Category	Avg	Total
Furniture Mattress And Upholstery	3.89	37
Home Comfort	3.88	393
Audio	3.83	346
Home Comfort 2	3.83	23
Fashion Male Clothing	3.82	105
Office Furniture	3.64	1249
Security And Services	2.50	2

Yearly Total Reviews

● Total # of Reviews   ● Average Review Rating

Year	Total	Avg
2016		3.97
2017	41K	4.19
2018	55K	4.13
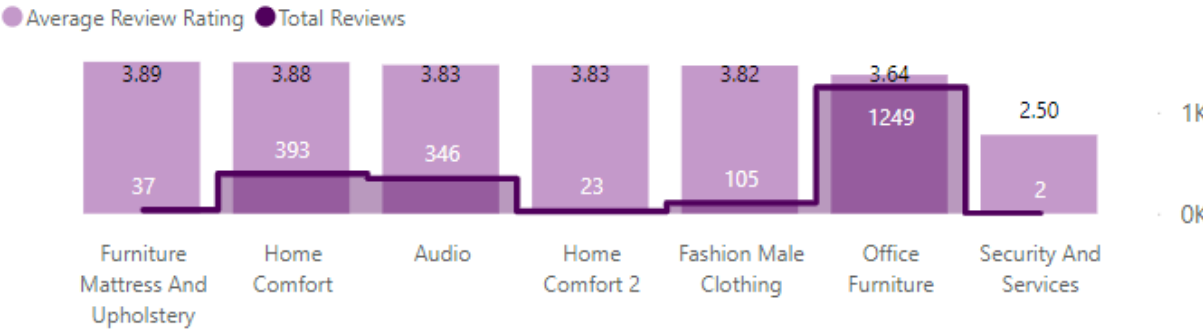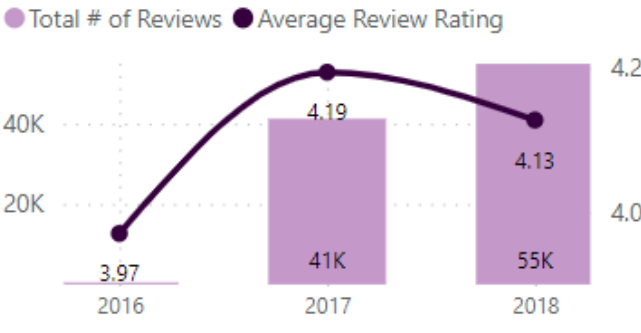
Analysis and Insights from Review Performance Dashboard

1. **Overall Reviews and Average Rating:** There are a total of 99.22 thousand reviews with an average rating of 4.09.

2. **Distribution of Ratings:**
   A. 5-star rating: 57.33 thousand
   B. 4-star rating: 19.14 thousand
   C. 3-star rating: 8.18 thousand
   D. 2-star rating: 3.15 thousand
   E. 1-star rating: 11.42 thousand

3. **Top 5 Product Categories by Average Review Rating:**
   A. CDs, DVDs, Musicals: 6.67%
   B. Flowers: 4.39%
   C. Kitchen: 4.25%
   D. Music: 4.21%
   E. Arts and Craftsmanship: 4.17%

Analysis and Insights from Review Performance Dashboard

4. **Average Review Rating and Total Reviews for the Bottom 7 Product Categories:**
   A. Furniture, Mattress, and Upholstery: 37 total reviews with a 3.89% average rating
   B. Home Comfort: 393 total reviews with a 3.88% average rating
   C. Audio: 346 total reviews with a 3.83% average rating
   D. Home Comfort 2: 23 total reviews with a 3.83% average rating
   E. Fashion Male Clothing: 105 total reviews with a 3.82% average rating
   F. Office Furniture: 1249 total reviews with a 3.64% average rating
   G. Security and Services: 2 total reviews with a 2.50% average rating

5. **Top 7 Product Categories by Total Number of Reviews:**
   A. Bed, Bath, Table: 9.3 thousand
   B. Health and Beauty: 8.7 thousand
   C. Sport Leisure: 7.5 thousand
   D. Computer Accessories: 6.5 thousand
   E. Furniture Décor: 6.3 thousand
   F. Housewares: 5.7 thousand
   G. Watches Gifts: 5.5 thousand

Analysis and Insights from Review Performance Dashboard

6. **Reviews in 2017 and 2018:**
   A. In 2017, there were a total of 41 thousand reviews with an average rating of 4.19%.
   B. In 2018, the total number of reviews increased to 55 thousand, with an average rating of 4.13%.

This analysis provides insights into the distribution of reviews and ratings, top product categories by average review rating, lowest-rated categories, and the number of reviews for different years. These metrics can help the company understand customer sentiment and product performance, allowing for data-driven decision-making and potential areas for improvement.

Product Reviews Recommendations

1. **Customer Feedback Loop:** Establish a robust feedback loop with customers to gather insights on product quality, customer satisfaction, and areas for improvement.

2. **Focus on Low-Rated Categories:** Pay special attention to product categories with lower average review ratings, such as "Office Furniture" and "Security and Services." Work with suppliers to address quality issues.

3. **Product Curation:** Reevaluate the product selection in low-rated categories and consider discontinuing or improving underperforming products.

4. **Promote Top-Rated Categories:** Capitalize on the top-rated categories, like "CDs, DVDs, Musicals" and "Flowers," by promoting them to customers and potentially expanding the product offerings within these categories.

5. **Review Response:** Respond to customer reviews, especially negative ones, in a timely and constructive manner. Show customers that their feedback is valued and that improvements are being made.

6. **Quality Control:** Implement stringent quality control measures to ensure that products meet customer expectations. This can involve pre-shipment inspections and supplier audits.

7. **Review Incentives:** Encourage customers to leave reviews by offering incentives, such as discounts on future purchases or loyalty rewards.

Overall Sales Performance Recommendations

1. **Diversify Product Offerings:** While the Health and Beauty category is performing well, consider expanding product offerings in other high-growth categories like Computer Accessories. Diversifying the product range can help capture a broader market.

2. **Quality Control and Customer Reviews:** To maintain the high sales generated by 5-star-rated products, focus on maintaining quality control and encouraging satisfied customers to leave positive reviews. Positive reviews can boost sales.

3. **Leverage Credit Card Sales:** Since a significant portion of sales are made using credit cards, explore partnerships with credit card companies to offer exclusive discounts or promotions to cardholders, attracting more sales.

4. **Year-over-Year Growth:** Recognize the growth in revenue from 2017 to 2018. To sustain this trend, invest in marketing and customer acquisition strategies, as well as exploring opportunities for expanding market reach.

5. **Product Category Optimization:** Continue to emphasize the Watches and Gifts product category, which has the highest average sales. Ensure that this category is well-maintained and explore opportunities to expand the product range within it.

6. **Quantity Sold vs. Sales Revenue:** Analyze the performance of the Bed, Bath, and Table category, which has the highest quantity sold but may have room for improvement in terms of sales revenue.

7. **Customer Engagement:** Implement customer engagement strategies to foster brand loyalty and repeat business. Consider loyalty programs, personalized recommendations, and excellent customer service to retain and attract customers.

8. **Data-Driven Decision-Making:** Continue to monitor and analyze sales data to identify emerging trends and adapt product offerings and marketing strategies accordingly. Utilize data-driven insights for effective decision-making.

9. **Competitor Analysis:** Keep a close eye on competitors in the industry. Understand their product offerings, pricing strategies, and customer engagement tactics to remain competitive and innovative.

10. **Invest in E-commerce Platform:** Ensure that the company's e-commerce platform is user-friendly, mobile-responsive, and offers a seamless shopping experience. A well-optimized website can boost sales and customer satisfaction.

11. **Supply Chain Efficiency:** Optimize supply chain and inventory management to prevent stockouts and maintain consistent product availability.

By implementing these recommendations, the company can build on its current success, maximize revenue, and enhance its market position. It's essential to maintain a customer-centric approach and adapt to changing market dynamics to achieve sustained growth and profitability.

Thank you!

Aster Ryan Lingad