



# **BUSINESS INTELLIGENCE**

## **FINAL PROJECT**

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## Table of Contents

BUSINESS PROBLEM:	3
DATASET INFORMATION:	3
STORYTELLING:	4
DASHBOARDS	5
REGIONAL ANALYSIS DASHBOARD	5
REGIONAL DISTRIBUTION OF ORDERS	5
REVENUE OVER TIME	5
OPTIMAL FUNCTIONING	6
ORDERS ACROSS DIFFERENT CATEGORIES AND BG	6
SUPPLY CHAIN MANAGEMENT DASHBOARD	7
QUANTITY SUPPLIED FROM FACTORY TO CUSTOMERS	7
COMPARISON B/W HIGHEST AND LOWEST LEVELS OF INVENTORY FOR DIFFERENT CATEGORIES	8
BRANCH PLANT MANAGING ORDERS	8
THE AFFECT OF SALES ON INVENTORY	8
PRICING/REVENUE DASHBOARD	9
VARIATION IN SALES TAX AND SUPPLY OVER YEARS	9
AVERAGE REVENUE GENERATED IN BUSINESS GROUPS FOR DIFFERENT BU	10
COMPARISON BETWEEN PRICES AND SALES TAX	10
CUSTOMER SEGMENTATION DASHBOARD	11
CUSTOMER PREFERENCE	11
CHURN RATE	12
CUSTOMER ORDER HISTORY	12
THE CHANGE IN CUSTOMER SATISFACTION OVER THE YEARS	12
INSIGHTS:	13
STRATEGIES	14
REGIONAL FOCUS	14
SUPPLY CHAIN OPTIMIZATION	14
PRICING AND REVENUE ENHANCEMENT	14
CUSTOMER SEGMENTATION AND SATISFACTION	14

# **BUSINESS PROBLEM:**

Philips, a multinational retailer, grapples with stagnant sales growth, revenue decline in select regions, inconsistent customer satisfaction, supply chain hurdles, and pricing and revenue optimization challenges. Identifying top-selling categories, resource allocation, and inventory management pose difficulties. Late product deliveries lead to customer discontent. Pricing strategy effectiveness and its correlation with revenue lack clarity. Moreover, undefined customer segmentation hampers targeted marketing. To tackle these issues, Philips must enhance sales analysis, streamline the supply chain, optimize pricing strategies, and refine customer segmentation for personalized marketing and enhanced satisfaction.

# **DATASET INFORMATION:**

The Philips dataset contains 223,121 records detailing orders placed between 2014 and 2020, featuring 23 columns of essential information. These columns encompass key data points such as PD, DC, Invoice no, Invoice Date, Customer Code, Customer Name, 12NC CODE, Item Description, Month, Year, City, Quantity, Amount, Sales Tax, Gross Amount, Material Group, BG Code, BU, Sub BG, Office Name, Order Type, Branch Plant, and Order no.

Additionally, the dataset has been enriched through Power BI queries, resulting in supplementary columns such as order status, customer satisfaction, region, churn rate, customer since, last purchase, price per item, and sales tax per item.

This dataset offers a comprehensive overview of Philips' ordering trends, customer behavior, and sales performance throughout the analyzed timeframe. The incorporation of derived columns extends its analytical potential, enabling businesses to delve deeper into areas like customer satisfaction, regional variations, churn rate, and financial metrics. Serving as a valuable asset for data-driven decision-making, this dataset empowers businesses to uncover insights, optimize processes, and make well-informed decisions based on observed patterns and trends.

# STORYTELLING:

To help Phillips, a multinational retail organization, overcome their pressing business challenges, we developed a series of powerful dashboards designed to provide valuable insights and recommendations. By leveraging these data-driven tools, we aimed to assist Phillips in addressing their issues head-on and achieving their business objectives.

Firstly, we focused on analyzing the distribution of Phillips products across different regions over time. This allowed us to identify the top-selling categories, total customers, revenue earned, and total orders in each region. Armed with this information, Phillips could make informed decisions on resource allocation and develop targeted marketing strategies to maximize sales and take advantage of regional demand.

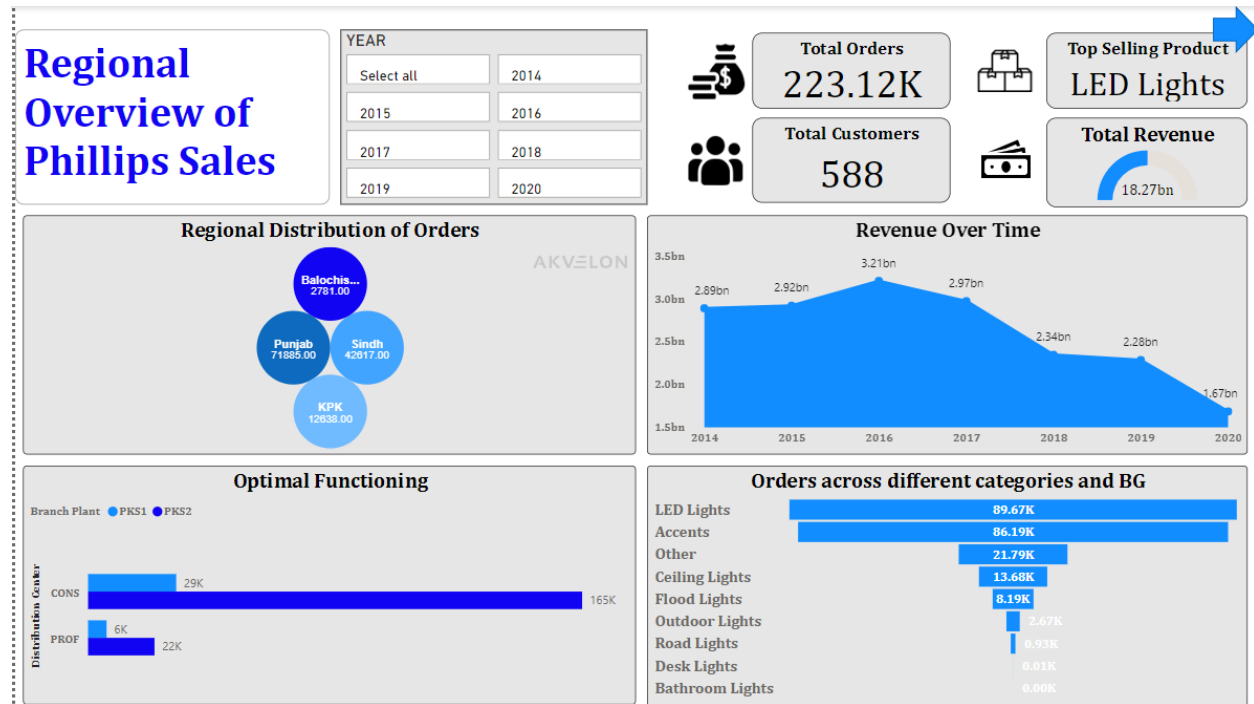
Next, our attention turned to optimizing Phillips' supply chain operations and improving customer satisfaction. By visualizing the product flow from warehouses to customer cities, we aimed to identify any bottlenecks or inefficiencies. Through this analysis, we provided recommendations on enhancing delivery efficiency, optimizing inventory management, and ensuring timely product delivery. By implementing these changes, Phillips can improve customer satisfaction and loyalty, resulting in increased sales and customer retention.

Addressing declining revenue and optimizing pricing strategies was another key focus. We provided Phillips with insights into the impact of their pricing strategies in different regions and categories over the years. Additionally, we analyzed the correlation between pricing and sales tax. Armed with this information, Phillips can make data-driven decisions on adjusting pricing strategies, conducting market research to understand price elasticity, and implementing dynamic pricing models. These strategies will enable them to adapt to changing market conditions and maximize revenue generation.

Lastly, we delved into customer segmentation to help Phillips gain a deeper understanding of their customer base. By analyzing customer behavior, preferences, and satisfaction levels, we facilitated effective segmentation. This segmentation empowers Phillips to tailor marketing strategies, implement loyalty programs, and execute targeted campaigns. The personalized experiences resulting from these efforts will enhance customer satisfaction and retention, driving growth and profitability.

# DASHBOARDS

## REGIONAL ANALYSIS DASHBOARD



The "Region Analysis" dashboard offers a thorough insight into sales performance and customer behavior across various regions. It comprises four crucial cards presenting essential metrics: the leading category in sales, the aggregate number of customers, total revenue generated, and overall orders placed. These cards provide a rapid overview of the company's performance within each region.

### REGIONAL DISTRIBUTION OF ORDERS

Within this dashboard, the bubble chart visually depicts the quantity of orders placed within each region. The bubbles' size correlates with the volume of orders, facilitating Philips in swiftly pinpointing regions exhibiting heightened order activity. This chart aids in discerning regions ripe for potential growth or areas necessitating focused attention.

### REVENUE OVER TIME

Simultaneously, the line chart illustrates the revenue accrued over the years. This feature enables Philips to monitor revenue trends and discern any seasonal or year-over-year patterns.

Stakeholders can further delve into a monthly perspective to scrutinize revenue fluctuations within each year, thereby gaining profound insights into revenue performance across time.

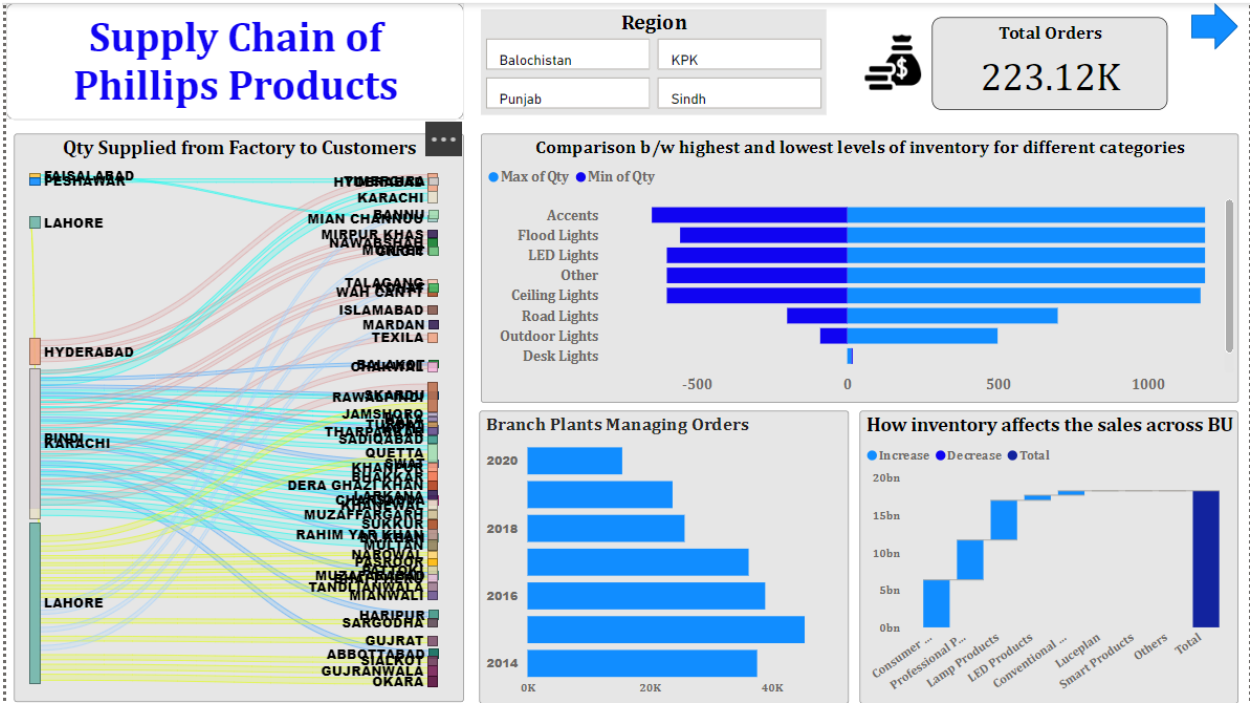
## **OPTIMAL FUNCTIONING**

The stacked bar chart emphasizes the efficient operation of distribution centers and branch plants. By displaying the order count on the x-axis, the chart empowers stakeholders to evaluate the performance and effectiveness of these facilities, identifying any disparities or opportunities for enhancement.

## **ORDERS ACROSS DIFFERENT CATEGORIES AND BG**

Finally, the funnel chart furnishes an overview of the order count within each category. This visualization enables stakeholders to observe the order count at each stage of the funnel, facilitating a deeper comprehension of conversion rates between categories. Moreover, the funnel chart permits drilling down to analyze the order count within each business group, offering insights into customer preferences and purchasing patterns.

# SUPPLY CHAIN MANAGEMENT DASHBOARD



The "Supply Chain Management" dashboard is dedicated to offering insights and analysis regarding the company's supply chain operations. It incorporates various visualizations and key cards aimed at comprehending sales performance, inventory management, order patterns, and the influence of inventory on business units.

Commencing with a region slicer, users can select a particular region for analysis. This slicer guarantees that all subsequent charts and cards present pertinent data tailored to the chosen region, facilitating focused analysis. The key card showcases the total sales figures, delivering a summary of the company's sales performance within the selected region.

## QUANTITY SUPPLIED FROM FACTORY TO CUSTOMERS

The Sankey chart illustrates the flow of product quantity from Philips' warehouses to customer cities. It visually represents the quantity of products supplied at each stage, offering a clear understanding of the distribution process and highlighting potential bottlenecks.

## **COMPARISON B/W HIGHEST AND LOWEST LEVELS OF INVENTORY FOR DIFFERENT CATEGORIES**

The stacked bar chart displays the minimum and maximum quantity for each product category, aiding in the evaluation of inventory management. By juxtaposing the minimum and maximum quantities, stakeholders can pinpoint categories with low stock levels or excessive inventory, empowering them to optimize inventory levels and mitigate risks of stockouts or overstocking.

## **BRANCH PLANT MANAGING ORDERS**

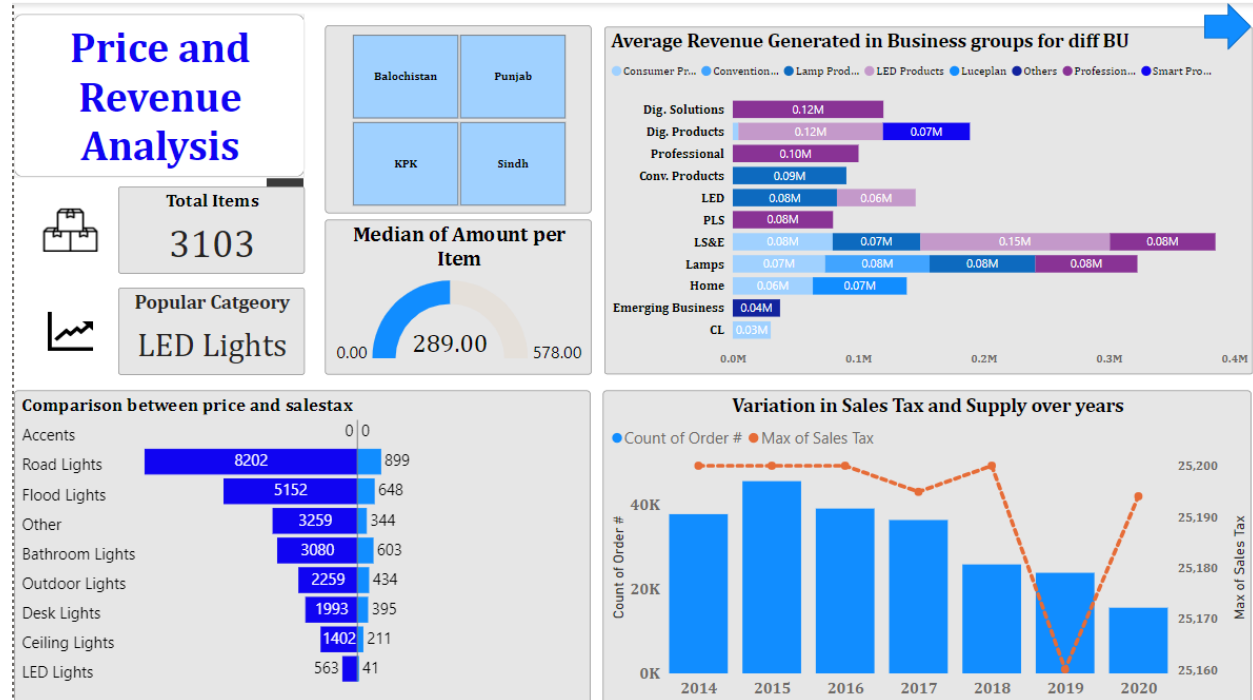
The subsequent chart exhibits the count of orders in each year, offering the capability to drill down to a monthly perspective and subsequently to branch plant distribution. This feature aids in identifying trends in order volume over time and assessing the distribution of orders among various branch plants. Consequently, it facilitates improved resource allocation and enhanced planning for order fulfillment.

## **THE AFFECT OF SALES ON INVENTORY**

Lastly, the waterfall chart visually represents the total revenue earned in each business unit (BU), illustrating the influence of inventory levels on sales performance across different BUs. By comprehending how inventory impacts revenue generation in each BU, stakeholders can make informed decisions regarding inventory management strategies aimed at maximizing sales and profitability.



# PRICING/REVENUE DASHBOARD



The "Price and Revenue Analysis" dashboard concentrates on scrutinizing pricing strategies and revenue generation. It furnishes insights into the total items, favored categories, average item price, and revenue garnered across diverse regions and business groups.

Within the dashboard, two key cards present pivotal metrics: the aggregate number of items and the favored category. These cards offer a swift overview of the company's product array and underscore the category garnering the most customer attention.

Simultaneously, the gauge visualizes the median item price. This feature offers a graphical representation of pricing levels, enabling stakeholders to promptly evaluate the pricing strategy and adjust as necessary. The region slicer aids stakeholders in conducting targeted analyses.

## VARIATION IN SALES TAX AND SUPPLY OVER YEARS

The column line chart amalgamates two metrics: the count of orders and the maximum sales tax. This visualization delineates trends in order volume over the years and facilitates stakeholders in drilling down to a monthly perspective. Such analysis aids in pinpointing seasonal patterns and fluctuations in sales tax, thereby offering insights into revenue generation and tax implications.

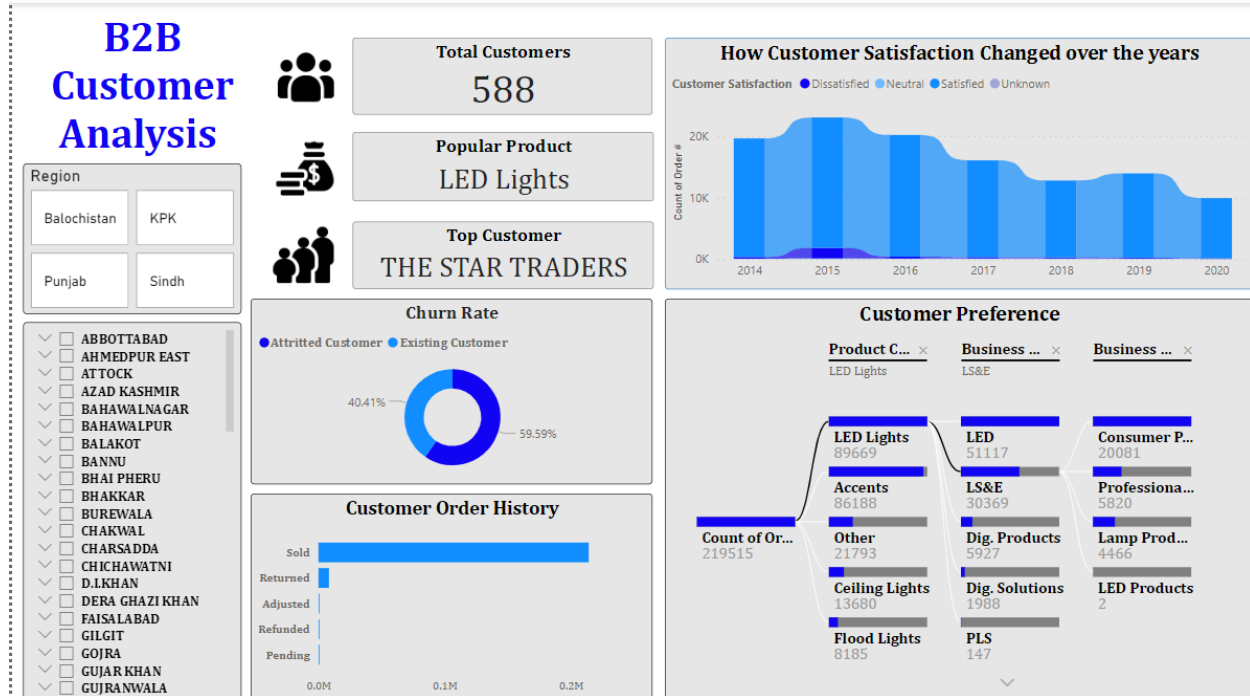
## **AVERAGE REVENUE GENERATED IN BUSINESS GROUPS FOR DIFFERENT BU**

Furthermore, the stacked bar chart illustrates the average revenue generated in each business group (BG), with the business units (BU) represented as the legend. This visualization enables stakeholders to compare the revenue performance of various business groups and discern areas of strength or opportunities for improvement.

## **COMPARISON BETWEEN PRICES AND SALES TAX**

Lastly, the tornado chart contrasts the average price of an item with the average sales tax on an item across different categories. This visualization aids in comprehending the relationship between price and sales tax, allowing stakeholders to pinpoint categories where pricing adjustments or tax optimization may be necessary.

# CUSTOMER SEGMENTATION DASHBOARD



The "Customer Segmentation" dashboard is dedicated to analyzing and comprehending customer behavior, preferences, and satisfaction levels. It furnishes valuable insights into customer segmentation, order patterns, attrition rates, and trends in customer satisfaction.

Within the dashboard, three key cards showcase pivotal metrics: the total count of customers, the top customer, and the leading category. These cards provide a swift overview of the customer base and spotlight the most valuable customer along with popular product categories.

Simultaneously, the region slicer facilitates focused analysis by filtering the remaining slicers according to the selected region. Additionally, the hierarchical slicer for cities and customers empowers stakeholders to choose specific customers and cities for analysis, enabling targeted segmentation and the examination of customer groups across different locations.

## CUSTOMER PREFERENCE

Furthermore, the decomposition tree chart scrutinizes the count of orders and elucidates it by product category, business group code, and business unit. This visualization offers a hierarchical perspective on the factors influencing order volume, enabling stakeholders to comprehend which

categories, BG codes, and BUs contribute to the highest number of orders. Consequently, stakeholders can identify areas of opportunity for targeted marketing efforts.

## **CHURN RATE**

The pie chart delineates the distribution of attrited and existing customers. This visualization aids stakeholders in grasping the churn rate and discerning the proportion of customers who continue to engage with the company. Consequently, it facilitates the implementation of targeted retention strategies and effective customer relationship management.

## **CUSTOMER ORDER HISTORY**

Meanwhile, the stacked bar chart exhibits customer behavior, with the y-axis depicting various statuses and the x-axis portraying the count of orders. This visualization empowers stakeholders to evaluate customer engagement levels and discern trends in customer behavior.

## **THE CHANGE IN CUSTOMER SATISFACTION OVER THE YEARS**

Lastly, the ribbon chart illustrates customer satisfaction levels over the years, with the option to drill down to a monthly perspective. This visualization provides insights into customer satisfaction trends, facilitating the identification of periods characterized by high and low satisfaction. Consequently, it enables targeted efforts to enhance the customer experience.

## INSIGHTS:

Some of the key insights we gained from our analysis were:

- Philips accrued a total revenue of 18.27 billion rupees in Pakistan from 2014 to 2020, with Punjab emerging as the highest contributing region, generating 11.3 billion rupees, while Balochistan yielded the lowest at 269 million rupees. This suggests that Philips has garnered a larger customer base and higher sales volume in Punjab over the years.
- LED lights emerged as the preferred product among customers in Punjab, Sindh, and KPK, whereas Accents gained more traction in Balochistan. This underscores regional variations in customer preferences.
- The year 2016, particularly the month of May, witnessed a notable surge in revenue for Philips, potentially attributable to the Pakistan Super League (PSL) matches occurring during that period. It is conceivable that customers purchased lights to create a conducive atmosphere for match screenings.
- Despite experiencing robust sales in Punjab, inventory management remains a challenge for Philips, indicating the necessity for improved planning and management to fulfill customer demands efficiently.
- The escalating sales tax over the years has exerted an impact on Philips' sales performance, underscoring customers' sensitivity to pricing alterations and implying the need for strategic pricing adjustments to sustain competitiveness.
- Customers in Sindh incur a relatively higher average price for products compared to other regions, potentially due to their inclination towards LS&E (Lighting Systems & Electronics) products, which tend to be more expensive. This might be attributed to the relatively higher socio-economic status in Sindh.
- Punjab and Sindh exhibit a significant proportion of attrited customers, indicating potential areas for enhancing customer satisfaction and retention efforts. Returns and dissatisfied customers are more prevalent in Punjab.
- LED lights have emerged as the top-selling product for Philips, likely owing to their luminous intensity and robust battery performance.

## **STRATEGIES**

Based on the insights gathered from the four dashboards, the company can implement several strategies to enhance its overall performance:

### **REGIONAL FOCUS**

Identify regions with high order activity and growth potential. Allocate resources and marketing efforts accordingly to maximize sales in these regions. Additionally, address regions requiring attention by developing targeted strategies to resolve issues and improve performance.

### **SUPPLY CHAIN OPTIMIZATION**

Analyze the quantity supplied from factories to customer cities to identify potential bottlenecks in the distribution process. Optimize inventory management by identifying categories with low stock levels or excessive inventory. Improve resource allocation and order fulfillment planning based on trends in order volume and distribution across different branch plants.

### **PRICING AND REVENUE ENHANCEMENT**

Analyze pricing strategies by comparing average prices and sales tax across different categories. Adjust pricing levels and optimize sales tax implications to ensure competitiveness and maximize revenue generation. Identify popular categories and adjust pricing accordingly to attract more customers.

### **CUSTOMER SEGMENTATION AND SATISFACTION**

Segment customers based on behavior, preferences, and satisfaction levels. Identify the most valuable customers and popular product categories to tailor marketing efforts and improve customer retention. Understand the factors influencing order volume and leverage insights to enhance customer engagement. Continuously monitor customer satisfaction levels and implement strategies to improve customer experience during periods of low satisfaction.