**Key Case Studies and Technical Solutions**

1. Identifying Factors Affecting Late Deliveries

* Objective: Understand which attributes (e.g., mode of shipment, product importance) contribute to late deliveries.
* Technical Solution: SQL queries to filter and group data based on delivery status (Reached\_on\_Time\_Y\_N).
* Data visualization using Power BI to create bar charts showing late deliveries by shipment mode.

2. Analyzing Customer Experience

* Objective: Evaluate customer satisfaction based on Customer\_rating and Customer\_care\_calls.
* Technical Solution: Aggregated analysis with SQL to calculate average ratings and call frequency.
* Pie charts in Power BI to visualize the distribution of Product\_importance levels.

3. Revenue and Discount Analysis

* Objective: Determine the impact of discounts on revenue.
* Technical Solution: SQL-derived calculations for net revenue (Cost\_of\_the\_Product - Discount\_offered).
* Line charts in Power BI to analyze revenue trends by warehouse blocks.

4. Weight and Cost Relationship

* Objective: Correlate product weight (Weight\_in\_gms) with costs and discounts to optimize pricing strategies.
* Technical Solution: SQL-based correlation analysis between Weight\_in\_gms and Cost\_of\_the\_Product.
* Scatter plots in Power BI to visualize patterns.

5. Delivery Time Optimization

* Objective: Predict and reduce late deliveries.
* Technical Solution: Data cleaning and preprocessing in SQL.
* Logistic regression models in Python to predict late deliveries based on input parameters.

**Technical Tools and Technologies Used**

1.Database Management

* SQL: Used for data cleaning, transformation, and querying to extract insights from the dataset.

2.Data Visualization

* Power BI: Created interactive dashboards and visualizations like bar charts, pie charts, and line graphs to represent findings clearly.

3.Programming and Analytics

* Python: Leveraged for advanced statistical analysis and predictive modeling (e.g., logistic regression).

4.Data Handling

* Excel: Used for initial data formatting, validation, and exporting data to SQL databases.

**Outcomes**

* Enhanced understanding of logistics operations through data-driven insights.
* Improved on-time delivery rates by addressing shipment mode inefficiencies.
* Streamlined revenue tracking and optimized discount strategies for profitability.
* Delivered a comprehensive dashboard for stakeholders to monitor logistics performance.