Food Delivery Logistics Optimization

Industry Overview :

The food delivery industry has experienced rapid growth due to urbanization, increased smartphone usage, and changing consumer lifestyles. Platforms such as food delivery applications connect customers, restaurants, and delivery couriers through digital systems. A major challenge in this industry is logistics optimization, which directly impacts delivery speed, cost efficiency, and customer satisfaction. Poor logistics planning can lead to late deliveries, high operational costs, and customer churn.

Organization Description :

The organization "Zomato" is a mid-sized food delivery company operating in multiple cities. The company partners with local restaurants and employs independent couriers using bikes, scooters, and cars.

Main Operations:

- Order placement through a mobile application
- Restaurant order preparation
- Courier assignment and delivery
- Customer feedback and ratings

The company collects large volumes of operational data related to orders, delivery times, couriers, and customers, making it suitable for Business Intelligence analysis.

Business Problem :

Despite advanced digital systems, food delivery platforms still face significant challenges:

- **Delayed deliveries** due to traffic congestion, weather conditions, or inefficient route planning
- **Inconsistent delivery performance** among delivery personnel
- **Lower customer satisfaction** during peak times, festivals, or adverse weather
- **Difficulty in predicting delivery time accurately**

These challenges directly affect customer retention, delivery partner ratings, and operational costs.

Business Objective :

The objective of this project is to analyze delivery operations using historical delivery data in order to:

- Identify key factors affecting delivery time
- Evaluate delivery partner performance
- Improve delivery time prediction accuracy
- Enhance overall customer satisfaction and operational efficiency

The Analytical Questions :

The BI solution will help answer these analytical questions by analyzing delivery data and business performance.

- **Delivery Efficiency by City** :What is the average delivery time across different cities?
- **Impact of Traffic** : How does traffic density affect delivery duration?
- **Impact of Weather** :Which weather conditions cause the longest delivery times?
- **Effect of Festivals** :Do festivals significantly increase delivery time?
- **Courier Performance** : Which delivery persons consistently perform better than average?
- **Delivery Speed vs Customer Satisfaction** : Is there a relationship between delivery person ratings and delivery time?
- **Effect of Multiple Deliveries** : Are multiple deliveries in one trip causing the delivery duration to increase?
- **Vehicle Condition Impact** : How does vehicle condition impact delivery speed?
- **Peak Demand** : What are the peak order hours and days?
- **Courier Demographics** : How does the delivery person's age correlate with delivery performance and customer ratings?

Key Performance Indicators :

These KPIs will be used to assess, monitor, and evaluate the performance and effectiveness of business operations:

- **Average Delivery Time (minutes)**

  → Measures overall delivery efficiency across all orders.

- **Average Customer Rating**

  → Indicates overall customer satisfaction with the delivery service.

- **Average Delivery Time During Festivals**

  → Measures delivery performance during peak demand periods.

- **Average Delivery Time During Non-Festivals**

  → Serves as a baseline for normal operational performance.

- **Average Delivery Time per Vehicle Type**

  → Compares delivery speed across different vehicle categories.

- **Average Orders Delivered per Courier**

  → Evaluates courier productivity

- **Percentage of Vehicles with Bad Condition**

  → Assesses the quality and reliability of the delivery fleet.

- **Percentage of Under-Performant Deliveries**

  → Identifies the proportion of deliveries exceeding acceptable time thresholds.

- **Maximum delivery duration**

  → Identifies the longest delivery time recorded, highlighting extreme delays and potential operational bottlenecks.