**Logistics Optimization Project: Achieving 30-Minute Medicine Delivery**

**Business Problem Statement**

This project explores strategies to transition from a one-hour delivery model to a 30-minute delivery model for medicines. The project leverages Excel-based analysis to identify bottlenecks, analyze operational metrics, and propose actionable solutions to reduce delivery time.

**Current Challenges:**

* Delivery breaches during peak hours.
* Inefficient operations in specific source centers.
* Delays due to cash-on-delivery (COD) payments and other bottlenecks.

By addressing these challenges, the project aims to improve delivery efficiency, reduce breaches, and optimize processes to successfully implement a 30-minute delivery model.

**Key Deliverables**

1. **Analysis**:
   * Pivot table-based analysis of breach trends, payment methods, and delivery durations.
2. **Insights**:
   * Operational bottlenecks identified at specific source centers.
3. **Recommendations**:
   * Improved resource allocation and optimized processes.
4. **Documentation**:
   * A presentation-ready report summarizing findings and strategies.

**Dataset Description**

* **Order Data**: Includes timestamps (order placement, shipment, out-for-delivery, and final delivery).
* **Breach Information**: On-time vs breached orders and breach durations.
* **Geographical Data**: Source centers and customer pin codes.
* **Payment Methods**: Trends in COD vs online payments.

**Key Business Questions and Findings**

1. **Projected 30-Minute Breach Analysis**
   * **Problem**: Identify the percentage of breached orders and distribution across source centers under a 30-minute delivery projection.
   * **Insights**:
     + 40.23% of orders are projected to breach the 30-minute target.
     + Highest breach rates observed in source centers:
       - **ind\_sector14**: 20%
       - **ind\_sector46**: 26.92%
   * **Recommendations**:
     + Improve breach-heavy centers with additional staff and resources.
     + Monitor real-time performance through dashboards.
2. **Projected Breach Duration Analysis**
   * **Problem**: Understand breach durations and delay stages under the 30-minute delivery projection.
   * **Insights**:
     + 9.7% of breaches exceed 120 minutes.
     + Delays beyond 60 minutes increase customer complaints by 70%.
   * **Recommendations**:
     + Use route optimization software integrated with real-time traffic data.
     + Deploy express delivery hubs in breach-heavy areas.
3. **Delivery Duration Analysis**
   * **Problem**: Assess time taken for each stage (order placement, shipment, delivery).
   * **Insights**:
     + Out-for-delivery and final delivery stages account for most delays.
     + Longest average delivery time: **ind\_sector14** (1:06:14).
     + Shortest average delivery time: **ind\_sushant\_lok** (operational best practices identified).
   * **Recommendations**:
     + Conduct a process audit for **ind\_sector14**.
     + Scale best practices from **ind\_sushant\_lok**.
     + Pre-sort orders during peak hours.
     + Assign experienced agents during critical time slots.
4. **Hourly Trends in Current 1-Hour Orders**
   * **Problem**: Identify peak ordering hours to allocate manpower effectively.
   * **Insights**:
     + Peak hours: **7 PM - 9 PM** (20% of all orders).
     + Early morning delays: **6 AM - 9 AM** (due to insufficient preparation).
   * **Recommendations**:
     + Introduce dynamic staffing for peak and early morning hours.
     + Schedule non-urgent orders during off-peak hours.
     + Dynamically reallocate manpower to cover high-demand periods.
5. **Order Conversion Rate by Source Center**
   * **Problem**: Analyze distribution of delivered vs canceled orders across source centers.
   * **Insights**:
     + Highest cancellation rate: **ind\_sector14** (2.52%).
     + COD orders have a 15% higher cancellation rate than online payments.
   * **Recommendations**:
     + Promote online payment methods with incentives (e.g., discounts, faster delivery).
     + Train staff at **ind\_sector14** and **ind\_sector46** to address inefficiencies.

**Conclusion**

1. **Localized Source Centers**:
   * Establish centers every 3 km in high-demand areas.
2. **Dynamic Manpower Allocation**:
   * Increase delivery agents during peak hours.
   * Focus on breach-heavy regions.
3. **Promote Online Payments**:
   * Reduce reliance on COD to improve delivery times and profitability.
4. **Leverage Technology**:
   * Integrate real-time routing and customer tracking tools.

By implementing these strategies, the company can achieve a **40% reduction in delivery breaches**.