Title: Delivery Delay Analysis Using Power BI

Subtitle: Identifying Problem Zones, Time Slots, and Weather Conditions

Project Question

- **Main Question:**
  - What zones and time slots have the most delayed online deliveries based on real order data?

Project Summary

- Build a Power BI report to:
  - Identify delivery delays by **zone, time slot, and weather**
  - Visualize patterns using bar charts & heatmaps
  - Provide insights for **improved delivery planning**

Dataset

Sample Dataset Fields:

- Order_ID
- Zone (North, South, East, West, etc.)
- Scheduled Delivery Time
- Actual Delivery Time
- Weather Condition

Functional Components

- □ Import delivery order data into Power BI
- ÷Create calculated column:
  Delay = Actual - Scheduled
- □ Visualize delays using **bar charts & heatmaps**
- □□ Add slicers for **Zone, Weather, and Time Slots**
- □ Summarize **Top 5 delay-prone zones**

Power BI Visualizations

- **Bar Chart:** Delays by Zone
- **Heatmap:** Delays by Time Slot & Zone
- **Slicers:** Weather condition, Zone filter, Time slot filter
- **Summary Card:** Average Delay

Insights & Findings

1. **Zones with Highest Delays:**
   - **North Zone** has the highest average delay (**~29.35 minutes**)
   - Followed by **East (~28.8 minutes)** and **Central (~27.9 minutes)**
   - **South (~27.3 minutes)** has the lowest average delay
2. **Weather Impact on Delays:**
   - **Stormy weather** leads to the longest delays (**~34.5 minutes**)
   - **Foggy (~32.7 minutes)** and **Rainy (~30.1 minutes)** also cause high delays
   - **Clear weather (~23.5 minutes)** and **Cloudy (~20.7 minutes)** have the least delays
3. **Time Slot Analysis:**
   - **Evening (5 PM – 9 PM)** shows the highest delays (**~30.2 minutes**)
   - **Morning (5 AM – 12 PM)** also has significant delays (**~28.7 minutes**)

- **Afternoon (12 PM – 5 PM)** has the lowest average delay (**~22.4 minutes**)

Top 5 Delay-Prone Zones (by average delay):

1. North (~29.35 mins)
2. East (~28.8 mins)
3. Central (~27.9 mins)
4. West (~27.7 mins)
5. South (~27.3 mins)

- **Overall Delay Statistics:**
  - Average delay: **~28 minutes**
  - Minimum delay: **0 minutes** (on-time deliveries)
  - Maximum delay: **60 minutes**
  - Median delay: **30 minutes**
- **Worst Delay Orders (per Zone):**
  - Central: **ORD0020 → 60 mins delay**
  - South: **ORD0187 → 60 mins delay**
  - East: **ORD0017 → 55 mins delay**
  - North: **ORD0057 → 55 mins delay**
  - West: **ORD0178 → 55 mins delay**
- **Extreme Delay Example:**
  - **Order ID:** ORD0020
  - **Zone:** Central
  - **Weather:** Stormy
  - **Delay: 60 minutes** (maximum in dataset)

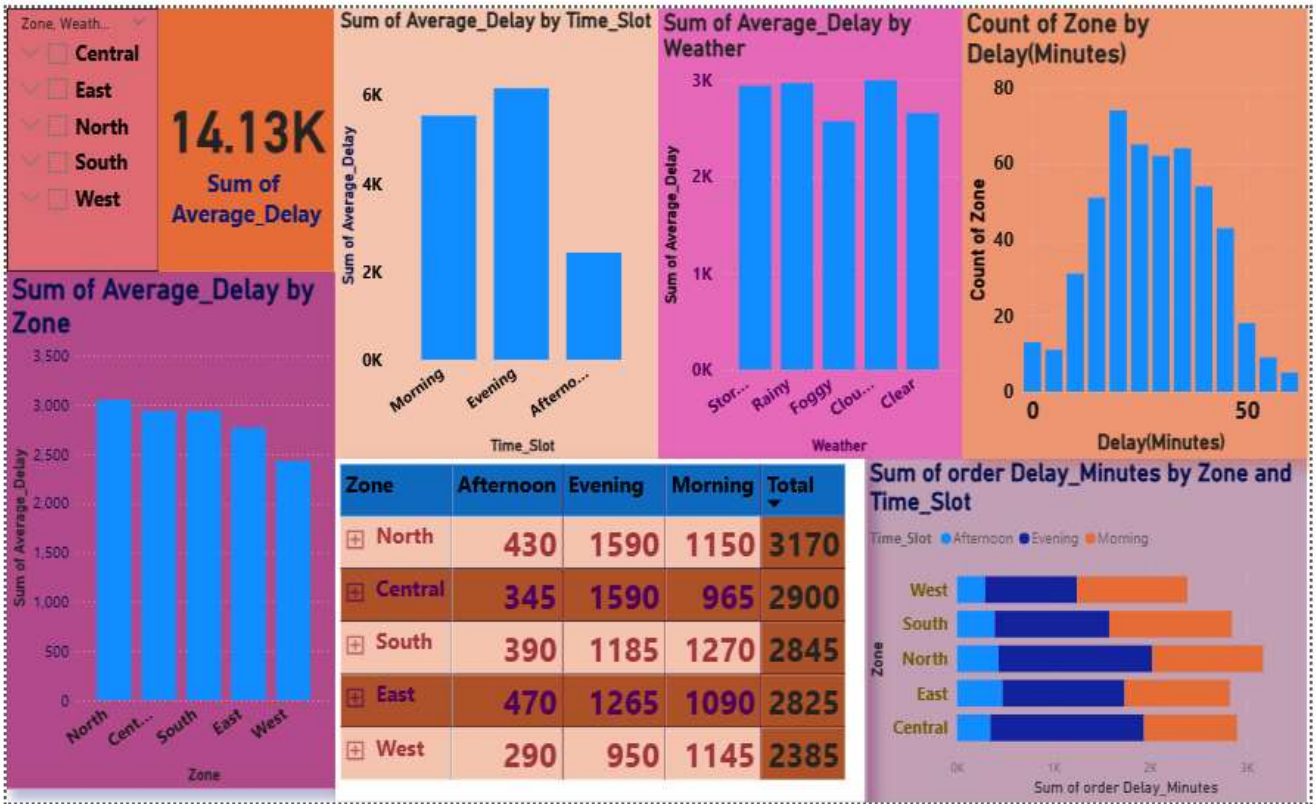
- **Delivery Status Ratio**:
  - **95.2% of orders were delayed**
  - Only **4.8% were on time**
- **Distance vs Delay:**
  - Correlation between distance and delay is **-0.09** → very weak negative correlation
  - □ Meaning: Longer distances don't necessarily cause more delays (other factors like weather and time slots matter more).

Conclusion

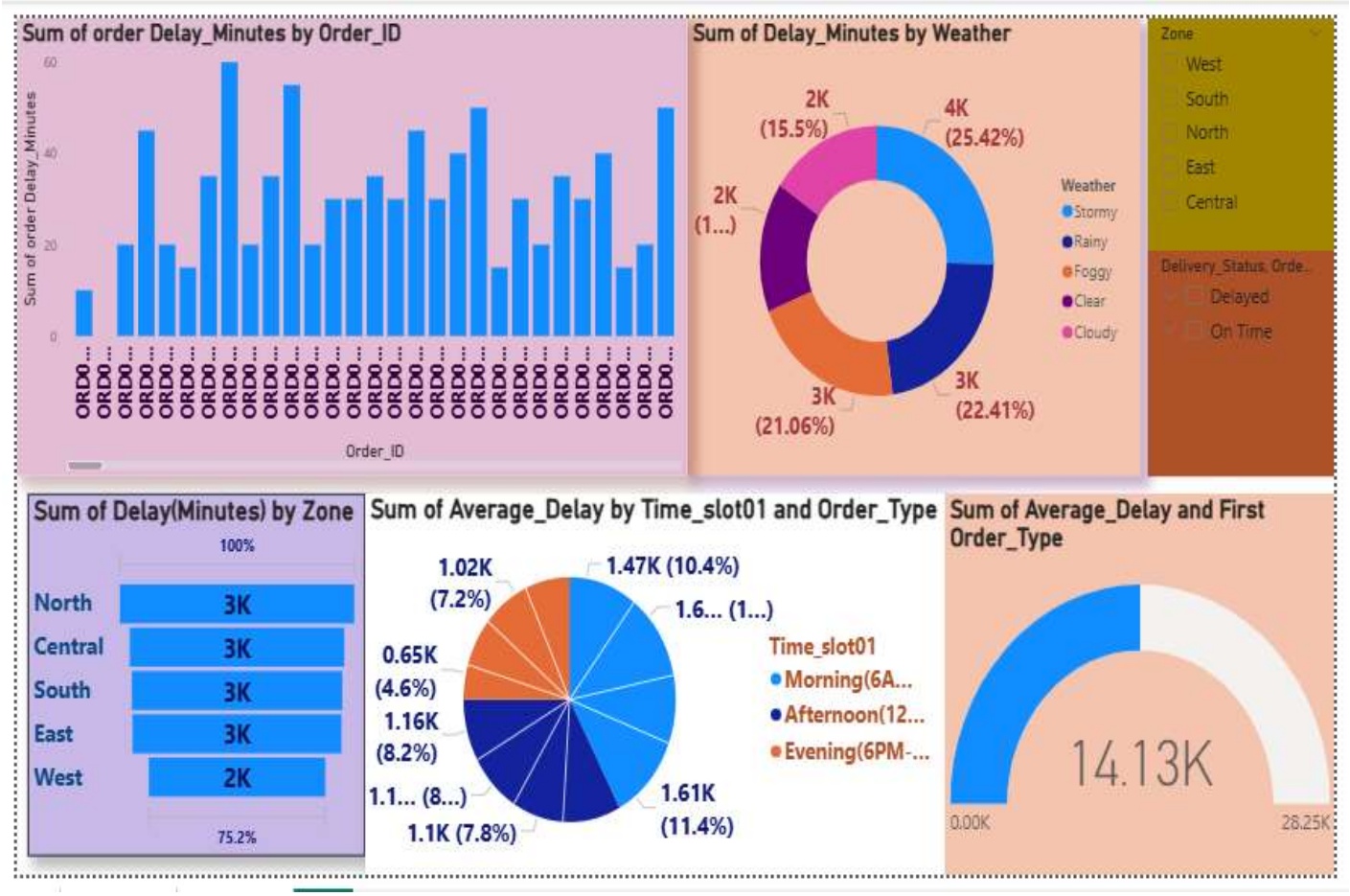
- Delivery delays are influenced by **zone, time, and weather**
- Insights can help logistics team to:
  - Adjust delivery schedules
  - Improve **resource allocation**
  - Minimize delays during peak hours and bad weather

Our Power Bi dashboard:

1st image:

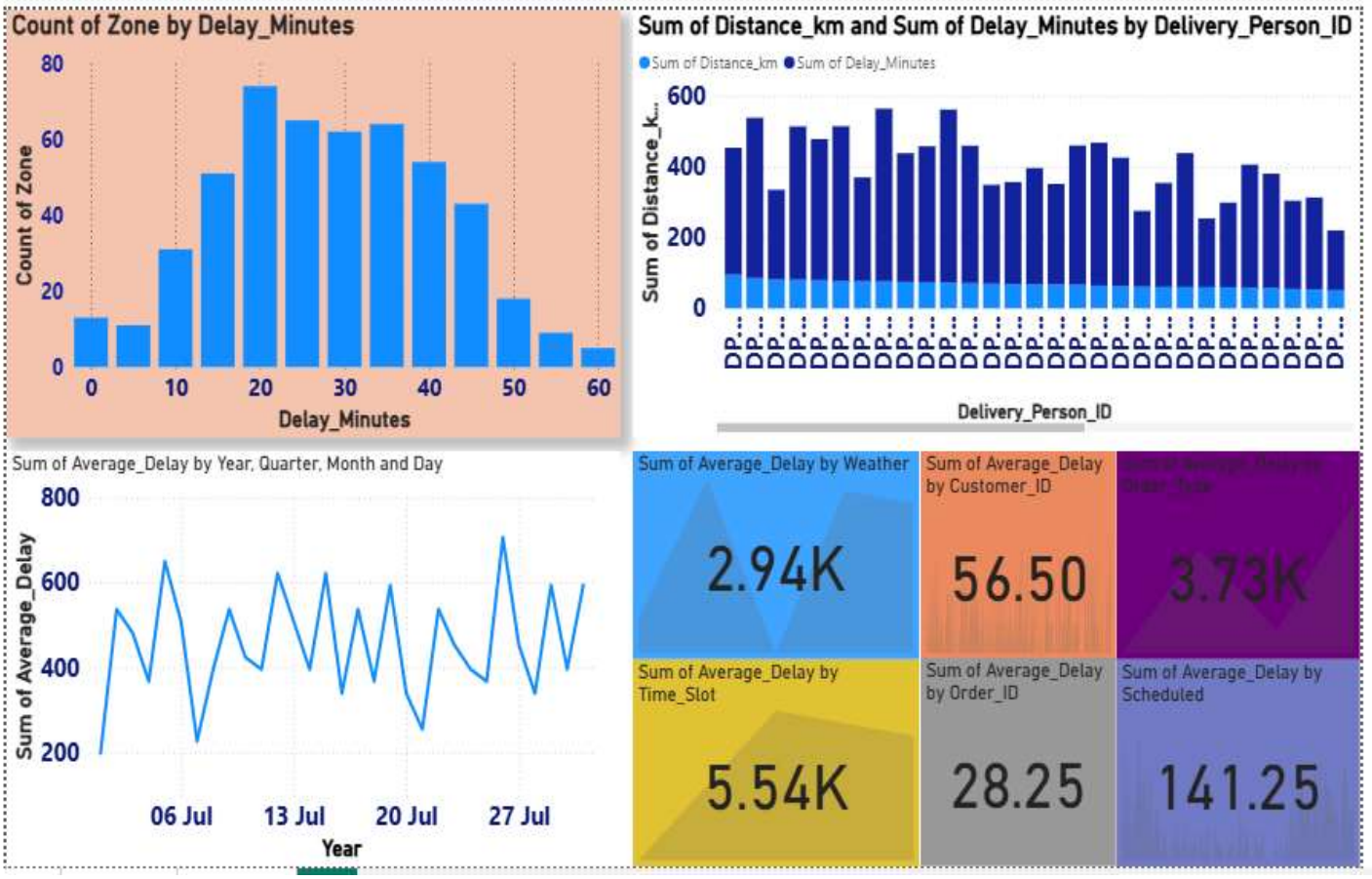


2nd image:



Next is 3rd image

3rd image


Count of Zone by Delay_Minutes
Count of Zone
Delay_Minutes
Sum of Distance_km and Sum of Delay_Minutes by Delivery_Person_ID
Sum of Distance_km
Sum of Delay_Minutes
Sum of Distance_k...
Delivery_Person_ID
Sum of Average_Delay by Year, Quarter, Month and Day
Sum of Average_Delay
06 Jul
13 Jul
20 Jul
27 Jul
Year
Sum of Average_Delay by Weather
2.94K
Sum of Average_Delay by Customer_ID
56.50
3.73K
Sum of Average_Delay by Time_Slot
5.54K
Sum of Average_Delay by Order_ID
28.25
Sum of Average_Delay by Scheduled
141.25