Pickup & Delivery Performance Analysis Dashboard

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1. Introduction

This report presents an analytical framework for evaluating **pickup density, demand patterns, and delivery performance** using geospatial insights. The primary objective is to optimize last-mile logistics, enhance courier workload balance, and improve delivery efficiency. The dashboard utilizes **Power BI** and **DAX formulas** for data-driven decision-making.

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2. Pickup Dashboard: Pickup Density & Demand Analysis

2.1 Objectives

Identify high-demand pickup regions.

Optimize courier workload distribution.

Determine peak hours for scheduling efficiency.

Track idle couriers for better utilization.

2.2 Key Performance Indicators (KPIs) & Formulas (DAX)

Total Pickups Per Region

TotalPickups = COUNT('PickupData'[package_id])

Peak Pickup Hour

PeakPickupHour =

TOPN(1,

   SUMMARIZE('PickupData', 'PickupData'[Hour], "TotalPickups", COUNT('PickupData'[package_id])),

   [TotalPickups], DESC)

Courier Load Balance Index

CourierLoadBalance =

DIVIDE(

STDEVX.P(VALUES('PickupData'[courier_id]), COUNT('PickupData'[package_id])),

AVERAGEX(VALUES('PickupData'[courier_id]), COUNT('PickupData'[package_id]))

)

Pickup Density by AOI

PickupDensityAOI = COUNT('PickupData'[package_id])

Pickup-to-Courier Ratio

PickupCourierRatio =

DIVIDE(COUNT('PickupData'[package_id]),
DISTINCTCOUNT('PickupData'[courier_id]))

High-Demand Regions Percentage

HighDemandRegionsPct =

VAR TopRegions =

   TOPN(ROUNDUP(COUNTROWS(VALUES('PickupData'[region_id])) * 0.2, 0),
'PickupData', [TotalPickups], DESC)

RETURN

   DIVIDE(SUMX(TopRegions, [TotalPickups]), COUNT('PickupData'[package_id])) *
100

Idle Courier Percentage

IdleCourierPct =

DIVIDE(

   COUNTX(FILTER(VALUES('PickupData'[courier_id]),

   NOT CONTAINS('PickupData', 'PickupData'[courier_id], [courier_id])), [courier_id]),

   DISTINCTCOUNT('PickupData'[courier_id])

) * 100

2.3 Visualizations

Heatmap – Identifies high-demand pickup locations.

Line Chart – Pickup trends by hour.

Box Plot – Courier load distribution.

Bar Chart – Pickup volume by region.

Pie Chart – Pickup share by AOI.

Gauge Chart – Idle courier percentage.

2.4 Expected Outcomes

Enhanced **resource allocation** in high-demand areas.

Balanced **courier workload** to prevent inefficiencies.

Reduced **idle time** for better operational performance.

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3. Delivery Dashboard: Geospatial Delivery Performance Analysis

3.1 Objectives

Identify **bottlenecks** in delivery time.

Evaluate **city-wise** delivery performance.

Measure **first-attempt success rates**.

3.2 Key Performance Indicators (KPIs) & Formulas (DAX)

Total Deliveries Per City

TotalDeliveries = COUNT('DeliveryData'[package_id])

Average Delivery Time Per Region

AvgDeliveryTime = AVERAGEX('DeliveryData', 'DeliveryData'[delivery_time] - 'DeliveryData'[accept_time])

Delivery Density Per AOI

DeliveryDensityAOI = COUNT('DeliveryData'[package_id])

Delivery Success Rate by Region

DeliverySuccessRate =

DIVIDE(COUNT('DeliveryData'[delivery_time]), COUNT('DeliveryData'[accept_time])) * 100

GPS Movement Analysis (Accuracy Check)

GPSAccuracy = AVERAGEX('DeliveryData', 'DeliveryData'[delivery_gps_time] - 'DeliveryData'[accept_gps_time])

First Attempt Success Rate Per City

FirstAttemptSuccessRate =

DIVIDE(

   COUNTX(FILTER('DeliveryData', NOT(ISBLANK('DeliveryData'[delivery_time]))), 'DeliveryData'[package_id]),

   COUNT('DeliveryData'[package_id])

) * 100

3.3 Visualizations

Geo Map – Delivery density heatmap.

Bar Chart – Delivery success rate by region.

Line Chart – Trends in delivery time by city.

Pie Chart – Deliveries by AOI.

Heatmap – Delivery time variation across regions.

3.4 Expected Outcomes

Identify geographical inefficiencies affecting delivery times.

Optimize routing to improve delivery performance.

Increase first-attempt success rates for improved customer satisfaction.

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4. Conclusion & Recommendations

4.1 Key Insights from Pickup Analysis

High-demand regions require better **resource allocation**.

Courier workload distribution needs improvement to prevent overload.

Idle couriers should be reassigned to optimize efficiency.

4.2 Key Insights from Delivery Analysis

Bottlenecks exist in certain regions, requiring **optimized routing strategies**.

GPS inaccuracies may be affecting **ETA estimates**.

First-attempt success rates highlight variations in customer behavior.

4.3 Recommendations

✔ **Resource Optimization** – Allocate couriers based on demand density.
✔ **Peak-Hour Scheduling** – Match courier availability with demand surges.
✔ **Route Optimization** – Utilize **real-time** tracking to reduce delays.
✔ **Performance Monitoring** – Continuous **KPI tracking** for decision-making.