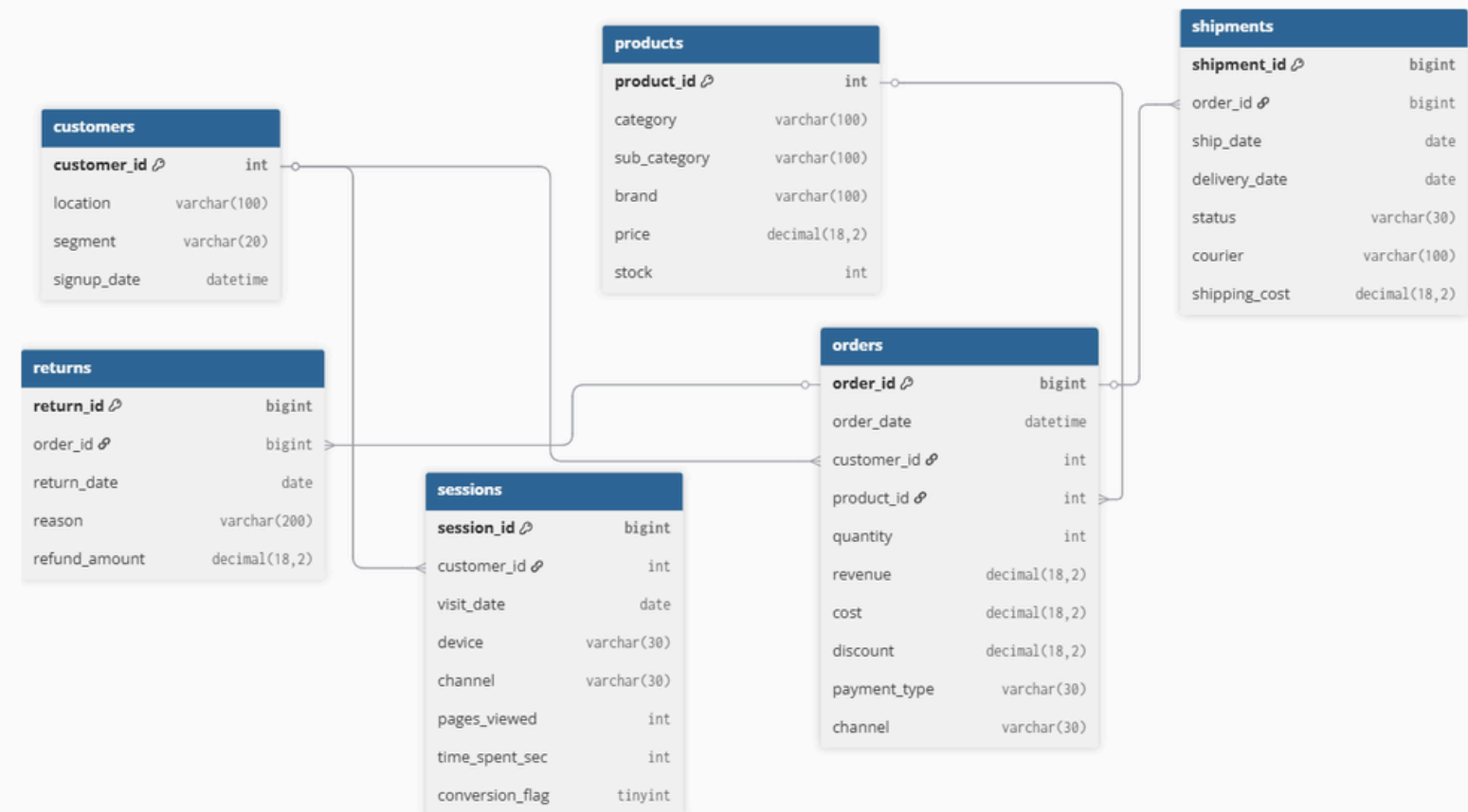# E-COMMERCE ANALYTICS

By Ajay Patel

# PROBLEM STATEMENT

- Businesses struggle to track sales, profit, returns, and funnel in one place.
- Objective: Build a 360° analytics dashboard to support leadership decisions.

# DATA PIPELINE

- Python → Cleaning & KPI prep
- SQL → Schema & Analytical Queries
- Power BI → Dashboard for Executives

# PYTHON HIGHLIGHTS

```python
orders['year_month'] = orders['order_date'].dt.to_period('M')
orders['margin'] = orders['revenue'] - orders['cost']
orders['aov_flag'] = 1

shipments['year_month'] = shipments['ship_date'].dt.to_period('M')
shipments['delivery_days'] = (shipments['delivery_date'] - shipments['ship_date']).dt.days.clip(lower=0)
shipments['on_time'] = (shipments['delay_days']<=0).astype(int)

returns['year_month'] = returns['return_date'].dt.to_period('M')

sessions['year_month'] = sessions['visit_date'].dt.to_period('M')
sessions['bounce'] = (sessions['pages_viewed']<=2).astype(int)
```

- Cleaned raw CSVs & derived KPIs (margin, delivery days, bounce rate).
- Exported BI-ready data into SQL.

# SQL HIGHLIGHTS

- Revenue & Orders trend by month.
- Conversion rate by device (App vs Web).
- 30+ SQL queries & BI views for KPIs.



```
269     -- Q10: Conversion rate by device
270  WITH s AS (
271      SELECT device, visit_date, COUNT(*) sessions
272      FROM sessions GROUP BY device, visit_date
273  ),
274  o AS (
275      SELECT DATE(order_date) od, COUNT(*) orders
276      FROM orders GROUP BY DATE(order_date)
277  )
278  SELECT s.device, SUM(COALESCE(o.orders,0))/NULLIF(SUM(s.sessions),0) conv_rate
279  FROM s LEFT JOIN o ON s.visit_date=o.od
280  GROUP BY s.device;
281
```

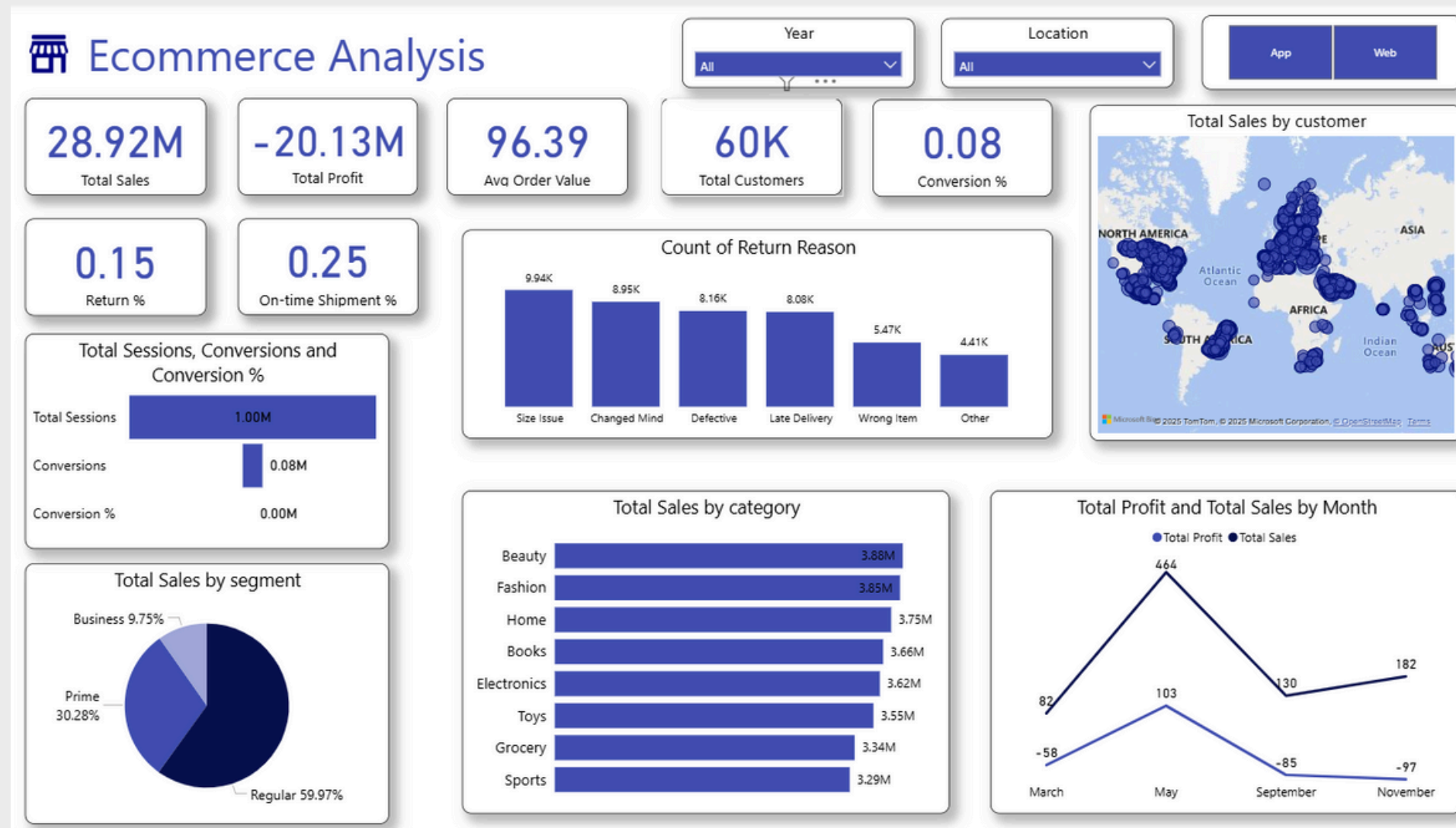| device | conv_rate |
|--------|-----------|
| App    | 0.5458    |
| Web    | 0.6662    |

```
219     -- Q1: Revenue and orders by month
220  SELECT DATE_FORMAT(order_date,'%Y-%m') ym, COUNT(*) orders_cnt, SUM(revenue) revenue
221  FROM orders GROUP BY ym ORDER BY ym;
222
```

| ym      | orders_cnt | revenue   |
|---------|-----------|-----------|
| 2023-01 | 9594      | 906034.56 |
| 2023-02 | 8869      | 845298.25 |
| 2023-03 | 9505      | 925349.29 |
| 2023-04 | 9149      | 877073.92 |
| 2023-05 | 9568      | 915328.73 |

# POWER BI DASHBOARD

# KEY BUSINESS INSIGHTS

- Beauty & Fashion top categories (~₹3.8M each).
- Prime customers contribute ~30% revenue.
- Size Issue & Changed Mind → 40%+ returns.
- Only 25% shipments on-time → logistics gap.
- Funnel leakage: 1M sessions → only 0.8% convert.

# RECOMMENDATIONS

- Improve logistics performance → target 90% on-time delivery.
- Address return reasons → size guide, product descriptions, quality checks.
- Optimize digital funnel → A/B testing, UI/UX improvements, personalized offers.
- Strengthen Prime customer loyalty → exclusive offers, rewards.
- Expand high-performing categories → Beauty and Fashion.