# Google Colab Link

Cleaned Dataset

## ***Analysis***

### A. Overall Sales Performance

- **Total historical sales:** ~10.01K
- **Forecasted sales (AI – yhat):** ~3.09M
- This large gap indicates:
  - Either **forecast is long-term** (multi-year)
  - Or **model is extrapolating aggressive growth**

➡️ Business interpretation: **Strong projected growth, but risk of over-forecasting if not validated.**

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### B. Past Sales Trend (2014–2017)

- Sales **decline sharply around 2016**
- Recovery in 2017, but **not stable**
- Indicates:
  - Demand volatility
  - Possible market disruption or operational inefficiency

➡️ Business interpretation: **Historical sales are unstable; forecasting must be used cautiously.**

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## C. Future Sales Forecast (2014–2018)

- Forecast shows **steady upward trend**
- No seasonal dips visible
- Indicates:
    - Model assumes **consistent demand growth**
    - Seasonality may not be fully captured

➡️ Business interpretation: **Optimistic forecast, but lacks seasonal realism.**

## D. Forecast vs Actual Sales (By Order Date)

- **Actual sales ≈ 0** compared to forecast line
- This is a **data alignment issue**, not business reality

Root cause (very important):

- Actual sales aggregated at **daily level**
- Forecast aggregated at **monthly / yearly level**
- Hence actual values appear as zero

➡️ Business interpretation:
**Dashboard logic issue — not a sales failure.**

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## E. Category Contribution (Quantity Share)

| Category | Quantity Share |
|---|---|
| Office Supplies | **~58%** |
| Furniture | ~21.8% |
| Technology | ~20% |

Key insight:

- Office Supplies = **high volume, low margin**
- Technology & Furniture = **lower volume, higher margin**

➡️ Business interpretation:
Revenue growth should **not depend only on Office Supplies**.

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### F. Geographic (State Filter)

- Multiple states available → potential for:
  - Regional performance comparison
  - Targeted state-level strategy

➡️ Business interpretation:
Geography can be used for **localized marketing & inventory planning**.

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# 2. Key Problems Identified (Critical)

**1️⃣ Forecast vs Actual chart is misleading**

- Actual sales plotted incorrectly
- Makes it look like **actual sales are zero**

**2️⃣ Forecast growth seems inflated**

- Forecast value (3.09M) far exceeds historical scale
- Risk of:
  - Overstocking
  - Cash flow misallocation

3️⃣ **Category risk concentration**

- Heavy dependency on Office Supplies quantity
- Profitability risk if margins shrink

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# 3. Clear Business Recommendations (Actionable)

## Recommendation 1: Fix Data Granularity (Highest Priority)

**Business impact:** High

- Align:
  - Actual Sales → Monthly aggregation
  - Forecast Sales → Monthly aggregation
- This will:
  - Show true performance gap
  - Improve executive trust in dashboard

📌 Without this fix, decisions based on this dashboard are **unsafe**.

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## Recommendation 2: Validate Forecast Before Scaling Operations

**Business impact:** High

Actions:

- Compare:
  - Last 12 months actual vs forecast

- Apply:
    - Confidence intervals
    - Conservative scenario planning

Decision rule:

> Do not increase inventory or hiring solely based on current forecasts.

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## Recommendation 3: Shift Growth Strategy Toward High-Margin Categories

**Business impact:** Medium–High

- Maintain Office Supplies for cash flow
- Increase focus on:
    - Technology
    - Furniture bundles
- Use:
    - Cross-selling (Office + Tech)
    - Promotional pricing in low-volume states.

## Recommendation 4: State-Level Targeting

**Business impact:** Medium

- Identify:
    - Top 20% states by sales

- Actions:
    - Higher inventory allocation
    - Faster delivery SLAs
- Reduce spend in low-performing states

### Recommendation 5: Add 3 KPIs to Strengthen Decision Making

For next dashboard version:

1. **Forecast Accuracy (MAPE)**
2. **Sales Growth % (YoY)**
3. **Category-wise Revenue (not just quantity)**

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# 4. (Short)

> "The dashboard shows unstable historical sales but an optimistic AI forecast. Office Supplies dominate quantity, but higher-margin categories like Technology and Furniture offer better growth opportunities. Before acting on the forecast, data granularity issues must be fixed to ensure forecast accuracy and avoid operational risk."