

Google Colab Link

[Cleaned Dataset](#)

Analysis

A. Overall Sales Performance

- Total historical sales: ~10.01K
- Forecasted sales (AI - \hat{y}): ~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.**

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.**

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 \approx 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.

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**.

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**.

2. Key Problems Identified (Critical)

① Forecast vs Actual chart is misleading

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

② Forecast growth seems inflated

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

3 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**.

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.

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. How to Explain This in Interview / Viva (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."