

# NimbusNest Inventory Turnover Case Study

NimbusNest is a fictional e-commerce brand focused on minimalist home organization products. This case study was developed to analyze inventory performance for Q1 2025, surface turnover insights, and improve stock movement strategies. It was built using Excel, SQL, and includes an early-stage visualization in R.

## Business Task

- Analyze inventory and sales performance across product categories
- Identify high and low turnover items
- Resolve data quality issues for improved reporting
- Deliver actionable insights to guide restocking and allocation

## Data Summary

The raw dataset contained over 400 rows of product-level records from multiple warehouses. It included common operational issues like missing sales units, non-standard date formats, and inconsistent text values such as 'N.A.' or 'null'.

## Cleaning & Analysis Steps

- Removed duplicates and standardized date formats
- Cleaned NA and inconsistent values using Excel and SQL
- Added Days Since Restock and Turnover Ratio columns
- Created pivot tables to summarize by category and warehouse

## Key Insights

- Closet Organizers had the highest turnover ratio (1.02), indicating healthy movement
- Underbed Boxes and Hangers showed signs of overstock or slow sales
- The average turnover ratio across categories was 0.51
- Data cleaning significantly impacted the reliability of these findings

## Recommendations

- Introduce alerts for low-turnover items
- Adjust procurement based on regional performance
- Reinforce input validation to reduce data entry gaps
- Use restock lag times as signals for replenishment strategy

## SQL Snapshot

```
SELECT
    product_id, category, warehouse,
    CAST(NULLIF(sales_units, 'N.A.') AS INTEGER) AS sales_units_cleaned,
    CAST(NULLIF(inventory_level, 'null') AS INTEGER) AS inventory_cleaned,
    PARSE_DATE('%m/%d/%Y', last_restock_date) AS restock_date_cleaned
FROM nimbusnest.inventory_raw
WHERE sales_units IS NOT NULL;
```

## R Visualization Snapshot

Using R and ggplot2, I created a simple bar chart showing turnover ratios by category. This helped reinforce my early skills with data visualization and tidyverse tools. While I'm still learning R, I am integrating it more into future analysis projects.

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