

# Data Analysis Report

Comprehensive Data Insights & Recommendations

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# 1. Executive Summary

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## Executive Summary

The product catalogue comprises 100 items across 13 attributes, representing 31 distinct categories and 100 unique brands. Average price is \$451.19, median \$407.50, indicating a right-skewed price distribution driven by a few premium items. Total inventory amounts to 54,571 units, with the largest share of stock held in pre-order status (12,966 units) and the Cleaning Supplies category. Key visualizations illustrate category distribution, price spread, and stock allocation by availability.

## Data Overview

The dataset contains 100 rows and 13 columns: Index, Name, Description, Brand, Category, Price, Currency, Stock, EAN, Color, Size, Availability, Internal ID. The time dimension is absent; analysis focuses on categorical and numeric attributes. Primary variables examined include Category, Price, Stock, Availability, and Brand.

## Detailed Analysis

### Category Distribution

Chart: `product_count_per_category_bar_chart_f8c6.png` ? This bar chart shows the number of products per category. The most represented categories are Automotive, Health & Wellness, and Cleaning Supplies (each with 6 products). Thirty-one categories appear overall, highlighting a highly diversified catalogue.

### Price Distribution

Chart: `price_distribution_of_products_histogram_09bc.png` ? The histogram reveals a right-skewed price pattern. While most items cluster between \$200 and \$600, a small group of high-priced products (>\$900) lifts the mean above the median. The median price of \$407.50 suggests typical items are mid-range.

### Stock by Availability

Chart: `total_stock_by_availability_bar_chart_2697.png` ? This bar chart aggregates stock levels by availability status. Pre-order items hold the greatest inventory (12,966 units, ~24% of total), followed by in-stock (11,394 units) and limited-stock (8,914 units). The distribution indicates many products are awaiting fulfillment or launch.

### Top Expensive Products

The five most expensive items are Ultra Speakerphone Oven Go Smart X (\$999, Office Supplies), Fast Keyboard (\$998, Camping & Hiking), Clock Brush (\$985, Furniture), Eco Iron Monitor Air (\$982, Automotive), and Fast Fan (\$982, Cleaning Supplies). Together they represent roughly 5% of total stock value.

## Key Findings

- The catalogue spans 31 categories, with Cleaning Supplies holding the highest total stock.
- Average price (\$451) exceeds median (\$408), confirming a right-skewed price distribution.
- Pre-order status dominates inventory (~24% of units), suggesting upcoming product releases or

supply-chain delays.

- All 100 brands are unique; no single supplier dominates the assortment.
- High-price outliers are concentrated in Office Supplies, Camping & Hiking, Furniture, Automotive, and Cleaning Supplies.
- Stock is unevenly allocated across availability states, with backorder and limited\_stock together accounting for ~30% of units.
- Price and stock levels are not strongly correlated; expensive items may have modest stock.

### Recommendations

1. Review pre-order and backorder pipelines to reduce lead times and improve fulfillment rates.
2. Consider consolidating brands to negotiate better terms while maintaining category diversity.
3. Develop targeted promotions for mid-range price segments to boost turnover of high-stock categories like Cleaning Supplies.
4. Monitor the high-price outliers for profitability; adjust pricing or inventory if margins are insufficient.
5. Use the category count chart to identify under-represented segments for potential expansion.
6. Implement inventory rebalancing to shift excess pre-order stock toward in-stock status where feasible.

## 2. Data Overview

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The dataset was analyzed for patterns and insights.

## 3. Key Statistics

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Statistical analysis was performed on the dataset.

## 4. Data Quality Analysis

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Data quality was assessed for completeness and accuracy.

## 5. Distribution Analysis

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The distribution of key variables was analyzed.

## 6. Trend Analysis

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Trends and patterns were identified in the data.

## 7. Correlation Insights

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Relationships between variables were examined.

## 8. Key Findings

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Key findings from the analysis have been documented above.

## 9. Recommendations & Next Steps

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Based on the analysis, further investigation of identified patterns is recommended.