# Power BI Project: Supply Chain Cost Optimization Dashboard

## Live Dashboard

👉 View the Live Supply Chain Dashboard

*For access or questions, contact istiak36@gmail.com.*

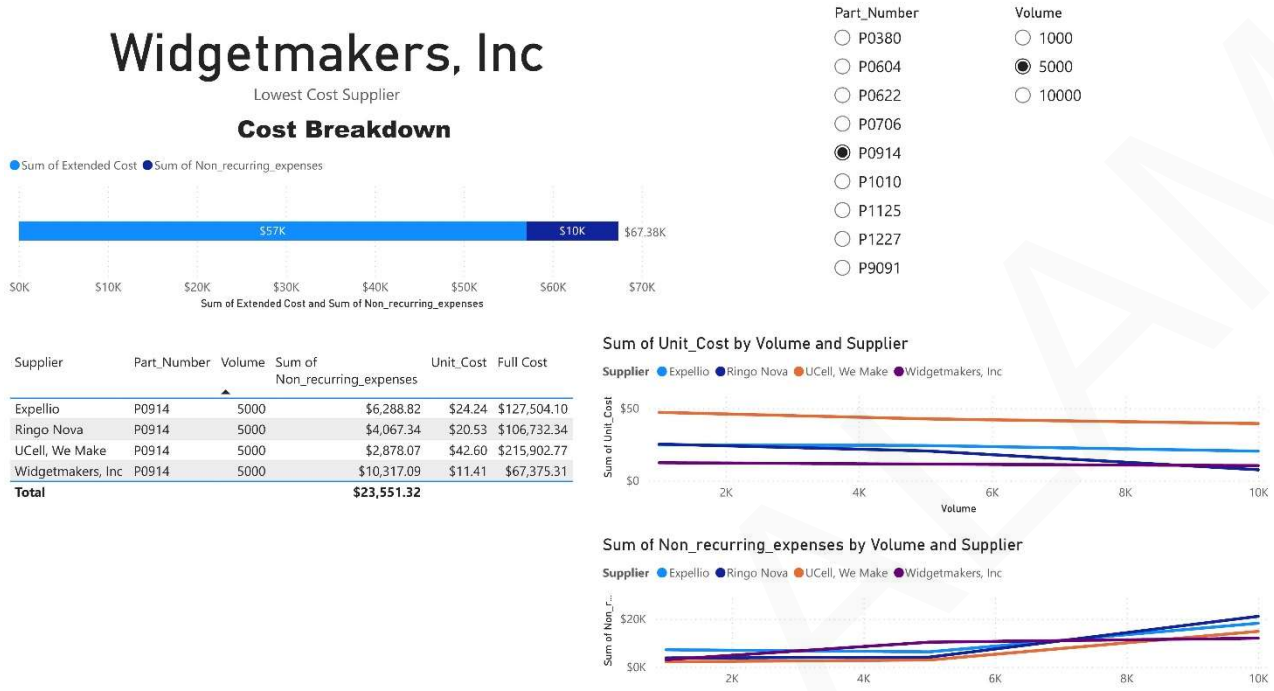
## Overview

This interactive Power BI dashboard delivers data-driven insights for supply chain cost optimization by enabling teams to compare supplier bids, analyze full procurement and production costs, and run robust make-vs-buy scenario analyses. With rich, visual analytics, operations and sourcing leaders can minimize costs, benchmark vendors, and optimize capital investments within a modern, visual platform.

## Features

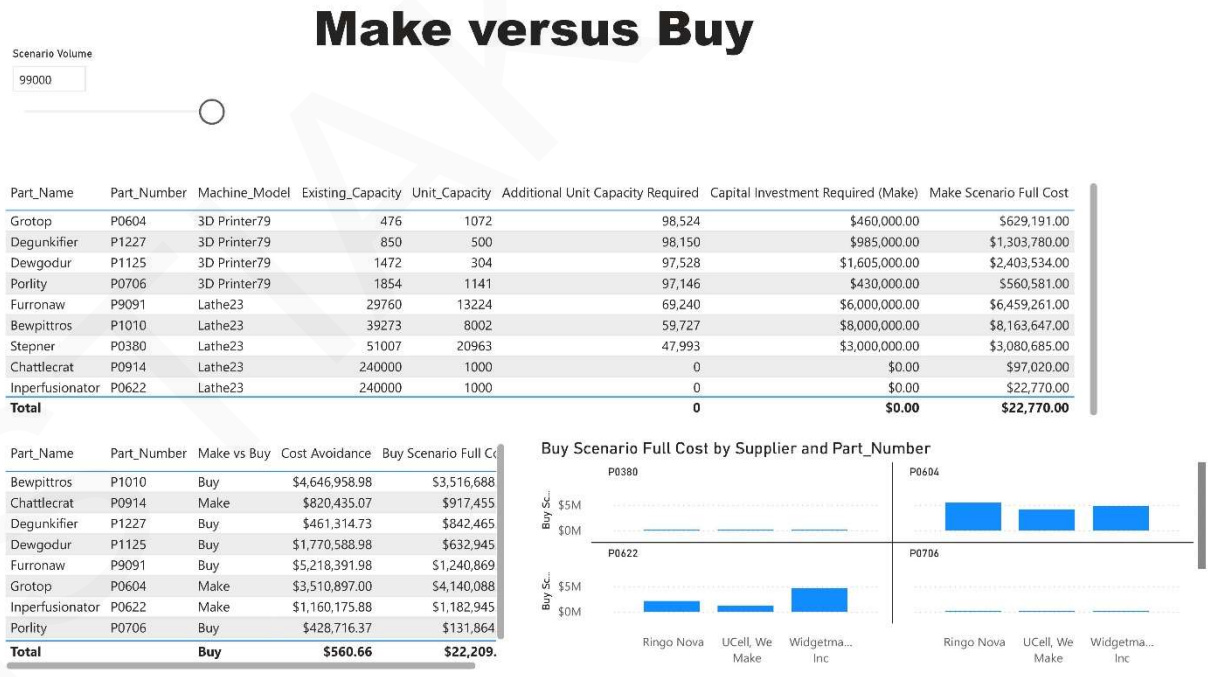
- **Supplier Cost Comparison:** Instantly compare non-recurring expenses, per-unit, and full costs for each part and vendor.
- **Cost Breakdown Detail:** Visualize extended costs, non-recurring expenses, and total volumes to see the drivers of procurement spending.
- **Scenario Analysis:** Evaluate buy scenario full costs at multiple supply volumes to support negotiation and batch optimization decisions.
- **Make vs Buy Decisions:** Assess capital investment, unit capacity, and scenario costs for strategic sourcing decisions.
- **Capital Planning:** Benchmark make and buy scenarios to maximize cost avoidance and capital efficiency.

## Dashboard Snapshots




*Compare all suppliers in terms of unit costs and non-recurring setup charges for high-volume buys.*


*Visuals show how extended procurement costs and upfront/non-recurring expenses stack by part and by supplier.*




*Understand the true cost impact of different purchase volumes and suppliers to support scenario planning and negotiation.*

## Key Insights

- Widgetmakers, Inc and Ringo Nova provided the **lowest per-unit plus full costs** for key parts, leading to significant savings at high volumes.
- Non-recurring engineering/setup costs vary widely between suppliers and must be included in real scenario evaluations.
- Make-vs-buy scenario analysis exposes where capital investment could be justified and where purchasing is measurably more cost-effective.
- Scenario planning for volume changes (e.g., 5,000 to 99,000 units) highlights the non-linear cost structure that should drive batch negotiation and vendor selection.

## How to Use

1. Use the live dashboard to adjust volume and supplier filters for scenario analysis.
2. Drill into visuals above for targeted, presentation-ready evidence of your supply chain analytics skills.
3. Apply these findings for procurement negotiations, budgeting, and capital investment decisions.

## About

**Author:** Istiak Alam
**Portfolio:** istiak-alam.github.io
**Email:** istiak36@gmail.com

*All data and visuals are for demonstration and portfolio purposes only. Images are located in the /images folder.*

## Technical Implementation

**Data Source:**

- Source data is received from ERP procurement system exports and supplier bid sheet files (XLSX/CSV).

**Data Storage:**

- All procurement, volume, and cost data are versioned and stored in a secured SharePoint directory, imported to Power BI Desktop.

**Update Frequency:**

- Data is updated as new supplier bids are received or when new volume forecasts are shared; typical cadence is per sourcing event or quarterly.

**ETL Process:**

- Power Query (M) handles all loading, transformation, and integration of disparate price/cost sheets.
- No external ETL tool required due to the limited data source complexity.

**Connection Mode:**

- Import mode—ensures fast response and all Power BI features, and works well for the batch-based, scenario-driven nature of the dataset.

**Data Transformation:**

- All mapping (supplier names, part IDs, cost fields) and unification is performed in Power Query, including conversion of all cost data to a single currency and resolving naming format inconsistencies.
- Challenges: inconsistent part number syntax from different suppliers, solved via conditional split columns and standardization.

**Data Modeling Challenges:**

- Needed to unify supplier and internal part identifiers; resolved with reference mapping tables and a robust star schema (Suppliers, Parts, Scenarios).

**DAX Functions:**

- Employed CALCULATE, SUMX, FILTER and scenario-dependent logic with SWITCH and IF to aggregate costs by scenario and volume.
- Used RANKX to highlight the lowest-cost supplier for each part.

**KPIs:**

- Unit Cost, Full Scenario Cost, Non-Recurring Expenses, Cost Avoidance (Make vs Buy)
- Cost per Supplier/Part, Volume-Driven Total Spend

**Best Practices:**

- Consistent, descriptive column/measure labeling; measures organized by folder.
- Adopted clear, high-contrast color schemas and custom tooltips.
- Used bookmarks for scenario and supplier switching.

**Performance Optimization:**

- Removed unnecessary columns and minimized visuals per page; all volume logic calculated in measures for optimized refresh.

**RLS:**

- Not required for this demonstration, but could be implemented for stakeholder- or product-line-limited access in a multi-client environment.

**Data Validation:**

- Cross-validated calculated totals against original ERP/tender quotes and summed by hand for key scenarios.

**End Users:**

- Supply chain managers, procurement leads, finance and operations executives.

**Data Refresh:**

- Manual upload/refresh for each event or scenario update; could be scheduled if source system connects directly.

**Collaboration & Sharing:**

- Dashboard shared on Power BI Service via secure links for sourcing teams; summary exports provided for supplier negotiations and executive review.