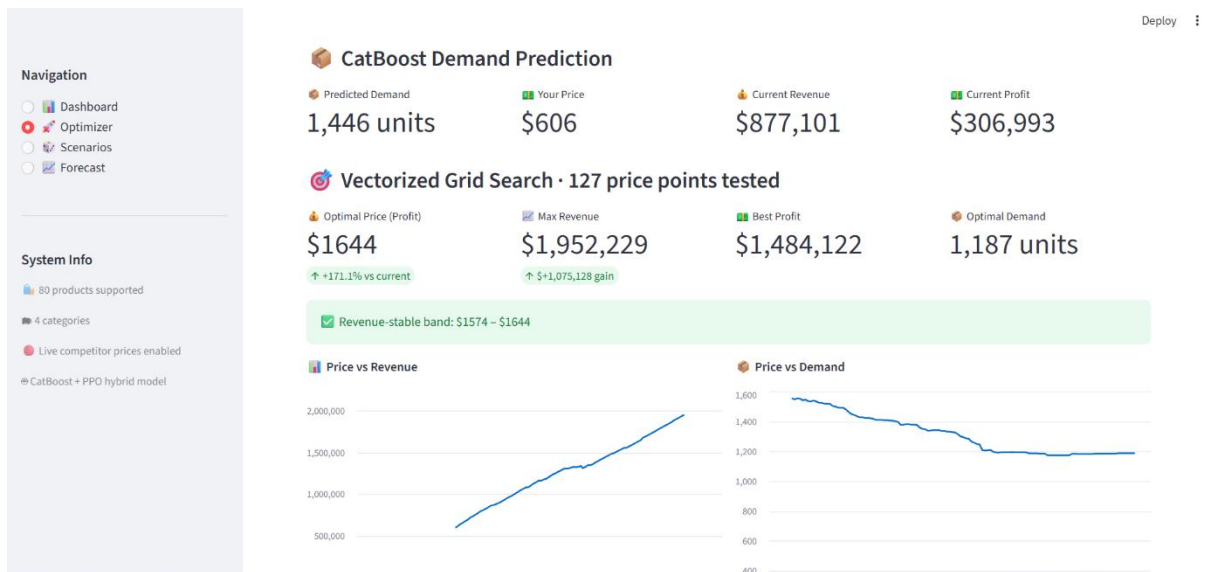


The screenshot shows the 'Dynamic Pricing Engine' dashboard. On the left is a navigation sidebar with options: Dashboard (selected), Optimizer, Scenarios, and Forecast. Below navigation is 'System Info' with details: 80 products supported, 4 categories, Live competitor prices enabled, and CatBoost + PPO hybrid model. The main content area has a 'Deploy' button in the top right. The title is 'Dynamic Pricing Engine' with a subtitle 'CATBOOST · VECTORIZED GRID SEARCH · PPO RL · LIVE DATA'. The main section is 'Model Training & Performance' with a 'Train Model' button. Below is 'System Overview' showing 80 Products, 4 Categories, 'Live + Model' Data Source, and 'CatBoost + PPO' Model. The 'Model Performance' section has a button to 'Click Train Model to train and see performance metrics.'

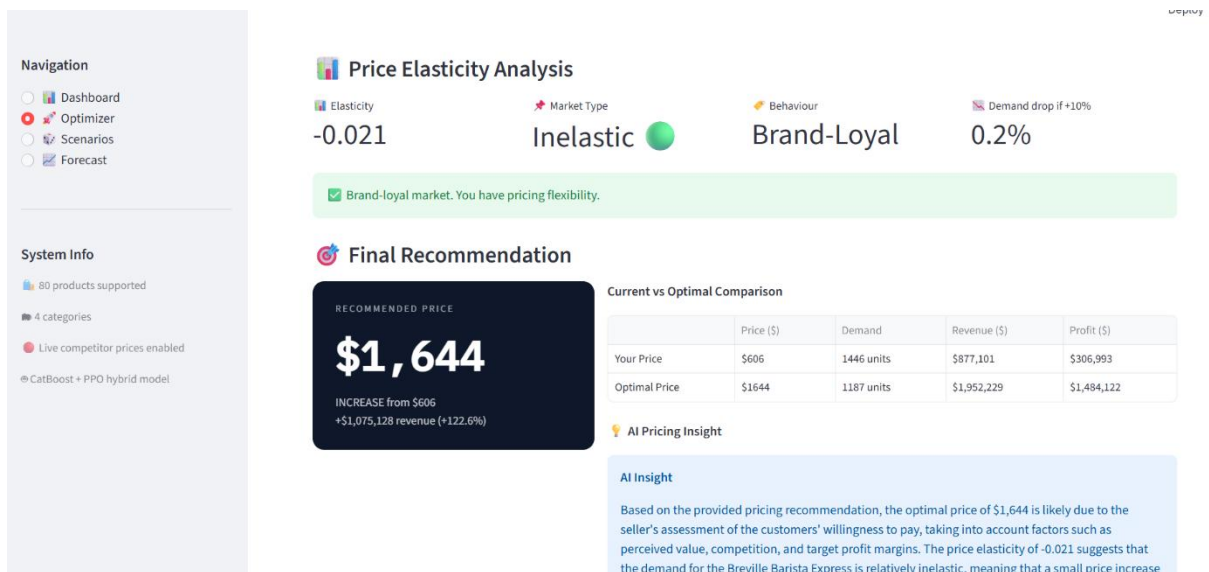
**Dynamic Pricing Engine dashboard showing model training performance and prediction metrics.**

The screenshot shows the 'Price Optimization Pipeline' interface. On the left is the same navigation sidebar as the first image. The main content area has a 'Deploy' button in the top right. The title is 'Price Optimization Pipeline' with a subtitle 'Step-by-step: Demand Prediction → Vectorized Batch Optimization → Elasticity → Recommendation'. There is a 'Use Live Data' toggle and a green status bar 'Live mode ON — Today: 22 March 2026 (Sunday)'. Below is a seller input panel with fields for: Category (Home & Kitchen), Product (Breville Barista Express), Promotion (No Promotion), Cost/Unit (\$) (394.20), Your Price (\$) (606.47), and Live Competitor Prices (Fetched from Google Shopping!). The competitor prices are: Competitor 1 (\$550), Competitor 2 (\$964), and Competitor 3 (\$1,500). At the bottom is a 'Run Optimization Pipeline' button.

**Price Optimization Pipeline — Seller input panel with category, product, promotion, cost, current price, and live competitor prices.**



**CatBoost demand prediction with grid search over 127 prices, yielding optimal price, max revenue, profit, stable band, and price–revenue/demand curves.**



**Price elasticity ( $\epsilon = -0.021$ , inelastic) with optimal price \$1,644, current vs. optimal comparison, and AI pricing insights.**

**Navigation**

- Dashboard
- Optimizer**
- Scenarios
- Forecast

---

**System Info**

- 80 products supported
- 4 categories
- Live competitor prices enabled
- CatBoost + PPO hybrid model

Deploy

Two specific actions the seller should take are:

- Target high-end customers:** Given the optimal price of \$1,644, the seller should focus on marketing and selling to high-end customers who are willing to pay a premium for a high-quality product like the Breville Barista Express. This could involve targeting specialty coffee shops, high-end home bakers, and enthusiasts who value the product's features and performance.
- Offer premium services and support:** To justify the higher optimal price, the seller could offer premium services and support, such as extended warranties, dedicated customer support, and exclusive access to expert training and resources. This would enhance the perceived value of the product and justify the higher price to customers who are willing to pay for a more comprehensive experience.

### Gradual Pricing Roadmap

Recommended step-by-step price increase to avoid customer churn

Download Search Settings

| Phase      | Price (\$) | Change | From Current |
|------------|------------|--------|--------------|
| Week 0-4   | \$649      | +7.0%  | +7.0%        |
| Week 4-8   | \$707      | +8.9%  | +16.6%       |
| Week 8-12  | \$778      | +10.0% | +28.3%       |
| Week 12-16 | \$840      | +8.0%  | +38.5%       |
| Week 16+   | \$1,644    | +95.7% | +171.1%      |

Gradual approach minimizes customer churn. Each step ≤10% increase. Final recommended price (\$1644) is reached by week 16.

**Gradual pricing roadmap with weekly steps to reach optimal price over 16 weeks, minimizing churn, plus AI-driven seller recommendations.**

**Navigation**

- Dashboard
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- Scenarios
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---

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Deploy

### Scenario Analysis

What-if analysis — how do market changes affect demand & revenue?

Category: Home & Kitchen Price (\$): 606.47

Product: Breville Barista Express Scenario: Competitor -10%

Analyze Scenario

#### Impact Analysis — Competitor -10%

| Base Demand | Scenario Demand      | Base Revenue | Revenue Impact     |
|-------------|----------------------|--------------|--------------------|
| 1,363 units | 1,347 units<br>↓ -16 | \$826,896    | \$-9,736<br>↑ Loss |

#### AI + RL Pricing Decision

AI STRATEGY

Based on the RL Agent's price direction, I recommend maintaining the current pricing strategy to minimize losses. Lowering our price further would likely

**Scenario analysis for competitor -10% pricing, showing demand and revenue impact with AI-driven pricing decision.**

**Navigation**

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---

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Deploy ⋮

Based on the RL Agent's price direction, I recommend maintaining the current pricing strategy to minimize losses. Lowering our price further would likely exacerbate the negative demand impact and revenue decline, as seen with the competitor's -10% price reduction. By standing firm on our current pricing, we can minimize the revenue loss of \$9736 and maintain market share.

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**Ask AI a Question**

Quick question:

Type my own question below

Your question:

Type your question here...

Get AI Answer

Made with ♥ using Streamlit - CatBoost - PPO Reinforcement Learning - Live Data

**AI strategy recommending price stability with Groq LLaMA insights and a free-text “Ask AI” query interface.**

**Navigation**

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---

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💰 **Dynamic Pricing Engine**

CATBOOST - VECTORIZED GRID SEARCH - PPO RL - LIVE DATA

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**12-Month Demand Forecast**

Category: Home & Kitchen Price (\$): 606.47

Product: Breville Barista Express Promotion: No

Generate 12-Month Forecast

**Annual Summary**

|   |   |  |  |
|---|---|--|--|
| <p>Peak Month</p> <p style="font-size: 1.5em;">Apr</p> <p style="font-size: 0.8em; color: green;">↑ 1,550 units</p> | <p>Lowest Month</p> <p style="font-size: 1.5em;">Oct</p> <p style="font-size: 0.8em; color: green;">↑ 749 units</p> | <p>Annual Revenue</p> <p style="font-size: 1.5em;">\$8,478,086</p> | <p>Avg Monthly Demand</p> <p style="font-size: 1.5em;">1,165 units</p> |
|---|---|--|--|

**12-month demand forecast with annual summary: peak April (1,550), lowest October (749), revenue \$8.48M, avg monthly demand 1,165.**

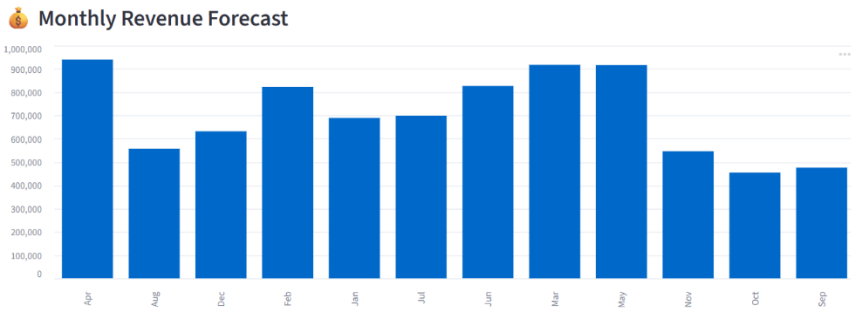
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### Month-by-Month Breakdown

| Month | Demand      | Revenue   |
|-------|-------------|-----------|
| Jan   | 1,137 units | \$689,466 |
| Feb   | 1,357 units | \$822,958 |
| Mar   | 1,513 units | \$917,580 |
| Apr   | 1,550 units | \$940,026 |

**Monthly revenue forecast bar chart and month-by-month demand and revenue breakdown table across all 12 months of the forecast period.**

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### AI Forecast Insight

Based on the provided data, here are three actionable recommendations:

- Inventory Buffer**: Maintain a minimum inventory level of 2-3 months' supply (around 3,100-4,650 units) to account for fluctuations and unexpected demand spikes during peak months, ensuring that stockouts are minimized.
- Price Optimization**: Conduct a price elasticity analysis to determine the optimal price. Considering the current price of \$606, a 5-10% price increase during peak months (Apr) could lead to increased revenue without negatively impacting demand. Conversely, a 5-10% price decrease during low-demand months (Oct) could incentivize sales and minimize lost revenue.
- Inventory Segmentation**: Segment the inventory by product condition (new, refurbished, open-box) and price accordingly. This approach can help to:
  - Clear slow-moving inventory by offering discounts on older or refurbished models during low-demand months.
  - Offer premium pricing for new products during peak months when demand is high.
  - Increase revenue and reduce waste by optimizing inventory turnover.

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**AI forecast insight with Groq LLaMA recommending inventory buffer, seasonal pricing, and segmentation strategies.**