# PriceOptima – Dynamic Pricing System

## KPI Definition Document

**Milestone 1: Requirements & Data Preparation**

# 1. Purpose of the KPIs

The goal of PriceOptima is to optimize product prices so that the business can increase revenue and profit while managing inventory efficiently.
To measure whether the dynamic pricing system is actually working, we will track the following Key Performance Indicators (KPIs):

1. Revenue Lift
2. Profit Margin Improvement
3. Conversion Rate
4. Inventory Turnover

These KPIs will be monitored before and after implementing dynamic pricing, using the baseline (old/static pricing) as a reference.

# 2. KPI Definitions

### 2.1 Revenue Lift

**Description:**
Revenue Lift measures the percentage increase in total revenue after implementing dynamic pricing compared to the baseline period with old pricing.

**Why it is important:**

- It directly shows whether the dynamic pricing system is generating more money.
- Confirms if the pricing model is effective at capturing customer willingness to pay.
- Acts as a primary business success metric for the project.

**Formula (example):**

- **Baseline Revenue** = Total revenue during the period with old pricing
- **Dynamic Pricing Revenue** = Total revenue during the period with dynamic pricing

*Revenue Lift (%)=Dynamic Pricing Revenue-Baseline Revenue/Baseline Revenue×100*

**Expected Target:**

- **8–12% increase** in total revenue after implementing dynamic pricing.

**Data Required:**

- Date
- Product ID
- Units Sold
- Selling Price
- Revenue

## 2.2 Profit Margin Improvement

**Description:**
Profit Margin Improvement tracks whether profit per product and overall profit margin improve after dynamic pricing, not just revenue.

**Why it is important:**

- Higher revenue is not enough if costs also increase or prices drop too much.
- Ensures that the model is optimizing for profitability, not just sales volume.
- Helps avoid situations where discounts increase revenue but reduce overall profit.

**Key Metrics:**

- Product-level profit
- Overall profit margin

**Example Calculations:**

For each product:

- ***Profit per Unit=Selling Price−Cost Price***
- ***Total Profit=∑(Profit per Unit×Units Sold)***
- ***Profit Margin (%)=Total Profit/ Total Revenue ×100***

Then compare baseline vs dynamic pricing periods.

**Expected Target:**

- **5–8% improvement** in overall profit margin or total profit.

**Data Required:**

- Product ID
- Cost Price (from Product Master Data)
- Selling Price
- Units Sold
- Revenue

## 2.3 Conversion Rate

**Description:**
Conversion Rate measures the percentage of users/customers who buy a product after viewing it at a given price.

**Why it is important:**

- Indicates how customers are reacting to the new prices.
- Helps understand price elasticity and demand sensitivity.
- A drop in conversion rate may suggest prices are too high; a rise indicates better alignment with customer expectations.

**Formula (conceptual):**

*Conversion Rate (%)=Number of Purchases/Number of Product Views or Sessions×100*

(If "views" data is not available, an approximate conversion rate can be computed at the store or campaign level using available traffic/visits.)

**Expected Target:**

- **3–5% improvement** in conversion rate after dynamic pricing.

**Data Required (ideal):**

- Product views / sessions (if available)
- Number of purchases (units sold or orders)
- Price at time of viewing

## 2.4 Inventory Turnover

**Description:**
Inventory Turnover measures how quickly inventory is sold over a specific period, after dynamic pricing is introduced.

**Why it is important:**

- Shows whether dynamic pricing helps clear slow-moving stock.
- Reduces holding costs and risk of obsolescence.
- Helps avoid both overstock and stockout situations by aligning pricing with inventory levels.

**Formula (example):**

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold (COGS)}}{\text{Average Inventory}}$$

or, for simpler analysis at product level:

$$\text{Inventory Turnover (units)} = \frac{\text{Total Units Sold in Period}}{\text{Average Stock Level in Period}}$$

Then compare turnover before and after dynamic pricing.

**Expected Target:**

- **10–15% improvement** in inventory turnover.

**Data Required:**

- Product ID
- Units Sold
- Stock Level (Beginning / Ending or Average)
- Cost Price (for COGS calculations)
- Restock Date / Inventory movements (if available)

# 3. Summary of KPI Targets

| KPI | Objective | Expected Improvement Target |
|---|---|---|
| **Revenue Lift** | Increase overall revenue | **+8–12%** |
| **Profit Margin Improvement** | Improve profit per product & overall margin | **+5–8%** |
| **Conversion Rate** | Improve percentage of visitors who purchase | **+3–5%** |
| **Inventory Turnover** | Sell inventory faster, reduce overstock/stockout | **+10–15%** |

These KPIs will be monitored periodically (e.g., weekly or monthly) to track the impact of PriceOptima over time and to guide further model tuning.