Case Study

Pricing and Discount Optimization for FMCG Retail

lynxanalytics

Introduction

Fast-moving consumer goods (FMCG) suppliers and retailers develop pricing strategies based on market experience, but to optimize retail performance they often need data and analytics they don't have at hand. A supplier that does not have its own storefronts, for example, can't know directly how customers respond to prices, pricing changes, or promotional discounts. As a result, its ability to fully collaborate with retailers to set recommended retail prices will be limited. On the other hand, retailers are closer to customers and have point-of-sale data, but the metrics are often high-level and siloed, which impedes in-depth analyses.

When striving to figure out the best price points and quantities to plan for, both suppliers and retailers need data-driven solutions that will help them uncover nuanced insights.

In this case study, a global FMCG supplier was crafting its collaboration strategy with one of its key supermarket chain partners in Southeast Asia. The chain represents more than half the supplier's business in the market and the supplier wanted to find the best possible pricing and promotional strategies, based on data-driven analyses at the SKU-level, to improve sales, revenues, and profitability for both entities.

The supplier asked Lynx Analytics to develop a model to forecast the optimum pricing and promotion strategies for the coming year and the quantities it should allocate to the supermarket. It wanted to find the best price points, understand how customers react to price changes, determine how far it could push prices without significant tradeoffs to other key metrics, and identify the best ways to discount and combine products on the store shelves.

Objective

01

Determine if the retailer's regular prices and promotion prices are too high or too low

Measure price elasticity of core SKUs to understand how pricing changes impact sales

02

03

Identify opportunities for further experimentation to improve demand and revenues

The Challenges

The supplier needs to optimize retail performance for its produce.

The supplier has a fixed amount of produce it needs to sell within a short distribution window of 6 months when the produce is in season.

It needs to allocate quantities accurately to meet local demand and make sure it is continuously selling produce from store shelves when quality is optimal, to maximize revenues.

The produce is available in two categories, conventional and organic. The SKUs are prepackaged based on these categories, with each package containing a set number of pieces. Both categories are sold at regular, discount, and stock clearance prices according to a discounting strategy set in agreement between the supplier and supermarket.

Given the similarity of the products, the company cannot tell how the supermarket customers' pricing preferences compare across SKUs, or the influence pricing and promotion of individual SKUs has on other SKUs.

The company needs to understand these types of complexities to inform its sales and promotion strategy for the upcoming season.

The Solution

Lynx Analytics performed a pricing and promotion study to provide planning inputs for the upcoming season. The project involved pulling together a database from internal and external sources, statistical analysis of historical datasets, building and fine-tuning a machine learning model, and simulating price and discount strategies under a variety of what-if scenarios.

Data sources

To understand consumers' purchase behavior as prices change across time, the team compiled the supermarket's daily POS data, aggregated for quantities and revenues across all its stores on a daily basis for a five-year period. To understand the supplier's associated costs and revenues, Lynx compiled applicable purchase orders for the same timeframe.

Lynx also considered supplementary information from external sources, such as inflation rates, seasonality of competing produce, and other macroeconomic conditions that can influence demand.

A composite model to understand prices and price interactions across SKUs

To build a model that will deliver insights at a high confidence level, the Lynx team first looked at historical trends in the data to validate the relationship between prices and revenues. This ensured that the underlying data reflected the economic fundamentals the model would be based upon.

The Solution

Given the similarity across SKUs, limited range of SKU prices and complex cross-impacts between SKUs, Lynx determined that the required analyses needed to go beyond the conventional linear regression methods to provide high confidence in the model performance.

Lynx then built a composite model that employed linear regression to estimate aggregated demand and used machine learning to estimate proportional demand for individual SKUs.

The combination of techniques allowed cross-SKU simulations that consider features such as price, seasonality, advertising, lag effects, and cannibalization between SKUs.

The Solution

Applying the model to answer key business questions

Lynx ran simulations under different scenarios and measured consumer responses to regular and promotion prices to determine if prices were too high or too low. Based on the customer responses, they used the model to estimate sales quantities, retailer's revenue, retailer's margin, and the supplier's revenue under the different scenarios.

Across all scenarios, the model suggested that regular prices were too high. Lynx recommended that the client consider a general decrease across SKU prices, and that it widens the gap between regular and discount prices.

The model also revealed that stock clearance prices were too low. Lynx recommended the retailer consider reducing the value of the discounts slightly and support the strategy with in-store advertising.

The Solution

To understand how consumers respond to price changes and any impacts caused by the relative pricing and positioning of similar products, Lynx used the model to measure price elasticity of individual SKUs and cross-price elasticities between SKUs. Key interactions across SKUs revealed opportunities to combine different SKU prices and discounts effectively.

01 The model showed that conventional SKU consumers were more price sensitive than organic SKU consumers and tend to navigate toward the lower-price conventional SKUs.

A significant proportion of organic SKU consumers are not price sensitive and will continue their purchases even if prices increase by a certain range. **02**

03 The model determined optimal discounting combinations across SKUs that the retailer can use in the upcoming season.

The Solution

The model is very versatile and can be used in various what-if experiments to explore a wide range of business questions. For example, it can be adapted to determine if changing the frequency of weekly discounts might further boost revenues.

Based on the model predictions across scenarios, Lynx recommended that the company offer discounts more frequently to promotion-sensitive consumers, focusing on non-organic SKUs.

Lynx also recommended the company established high-quality, premium positioning for organic SKUs and eliminate discounts for these.

Additional insights from statistical analysis

Separate from the simulations, Lynx also analyzed historical datasets for opportunities to find new key insights and suggest hypotheses for experiments. For example, the team evaluated the impact of additional ad spending during periods of lower prices. The analysis found that when deep discounts are offered on elected product categories, advertising delivers a noticeable increase in demand. Lynx recommended the company ramp up advertising for these products.

The Outcome

Lynx conducted multiple interim reviews with the client based on key evaluation metrics obtained from the composite model and constantly trained and updated the model to fine tune its performance.

The composite model is versatile and can be adapted for use by any supplier or retailer to uncover data-driven pricing and promotional campaign insights and to test hypotheses under a wide range of scenarios.

The supplier and supermarket, in line with the overall strategy to maximize retail performance, are now developing a strategy to reposition the organic products for sales growth.

They will also be incorporating experimentations in the sales strategy, to validate and explore opportunities that were identified from the various analyses.

Talk To Us

Headquartered in Singapore, Lynx Analytics is a leader in artificial intelligence and data science solutions. With a strong expertise in predictive analytics, Lynx Analytics helps businesses across the retail industry to improve forecasting, assortment planning, and promotion planning for e-commerce, omni-channel and brick & mortar operations.

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