Modeling Supply Chain Benefits of Efficient Assortment

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Summary: This project developed an assortment planning tool allowing a consumer goods manufacturer to assess its product mix from the perspective of cooperating retailers. Thanks to the tool, the manufacturer can rationalize its product portfolio in a way which increases utilization of its clients' supply chains and improves their financial results.

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KEY INSIGHTS

1. Reductions of product assortment can bring significant improvements of retailers' financial results.
2. Assortment reductions based on analyses of sales, financial, and operational data can help improve the efficiency of supply chain and reduce logistics costs, without sacrificing sales.
3. Collaboration between supply chain partners—sharing of transactional data and information about processes and objectives—is vital for successful assortment management.

Introduction

The economic downturn of 2008 created a challenging environment for companies in the retail sector and their trade partners. Initiatives undertaken by retailers in order to recover their former financial results—eliminating unproductive inventory, reducing unnecessary complexity, and dedicating more space to own private labels—increased pressure on their suppliers. Greater focus on assortment management brought upon stricter monitoring of the actual contribution of each carried Stock Keeping Unit (SKU). Store operators began to require that vendors justify introductions of new products through business cases including projections of incremental sales and changes in their revenues and profits.

GoodsCo—a major manufacturer of consumer goods ranging across numerous categories of merchandise—sells its products through multiple retailers present in several channels (incl. drug chains, mass merchandisers, grocery stores, and discounters). Because of the differing requirements of its clients, as well as due to their stricter performance monitoring, management of its wide portfolio of SKUs became an extremely challenging task for the supplier.

In order to better cope with the growing complexity of its product mix, GoodsCo wanted to reinforce its assortment management process with insights from data provided by cooperating retailers. Considering the amount of data and the range of relevant considerations, such insights required a new analytical model. Additionally, years of close collaboration with clients had given the manufacturer's team a good understanding of the strategies that they pursued and the goals which they expected each category of merchandise to support. GoodsCo was hoping that the new model would incorporate this knowledge and let its management view the product portfolio through the perspective of the supplier's downstream partners.

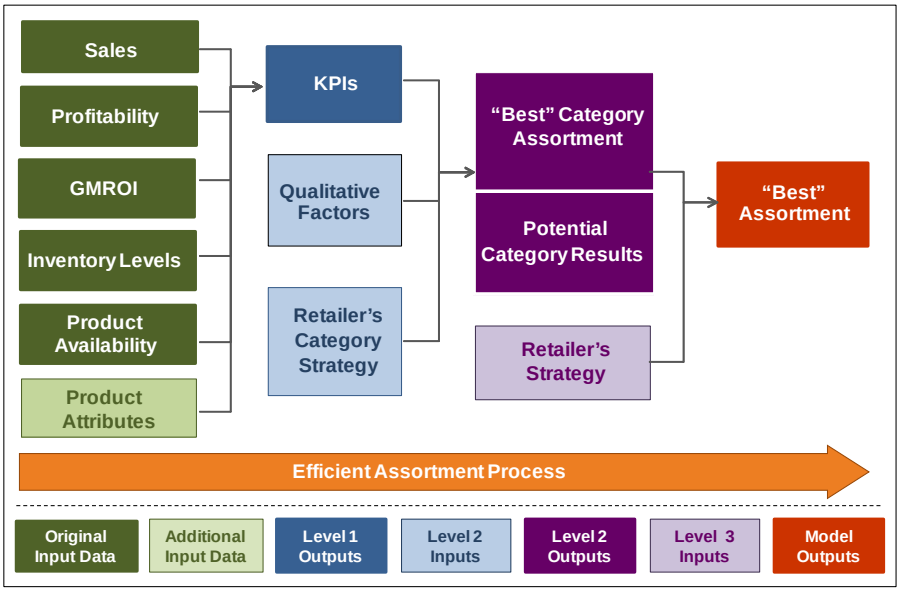

Figure 1: The scheme illustrates explains how the Efficient Assortment Model processes Point of Sale, financial, and operational data to arrive at the best assortment across categories.

Modeling of Efficient Assortment

The capability of evaluating product assortment through the retailers' lens was established in form of the Efficient Assortment Model. The tool utilizes Point of Sale, operational, and financial data of GoodsCo's downstream partners, as well as information about individual products (captured trough functional attributes). Based on the data, it recommends assortment changes at item, category and cross-category level. The recommendations are accompanied by projections of financial and operational results of suggested changes.

In order to ensure that the model can be used for all of GoodsCo's categories of merchandise, this research addressed three product groups representing different demand seasonality, degree of variety (number of Stock Keeping Units and diversity of functional attributes), sales' velocity, and profitability. To make sure that it properly addresses the needs of all retailers, regardless of channel, objectives, inventory management arrangements, and replenishment logistics, the model was developed for two distinct retailers – a mass merchandiser and a drug channel.

Figure 1 illustrates the process by which the Efficient Assortment Model transforms input data into suggestions regarding the product set which should be carried by a selected retailer in each category, and the retailer's shelf composition. First, eleven KPIs listed in Table1—each quantifying a decisive factor in retailers' assortment evaluations—are computed for every SKU within a category. In order to properly assess the risk of lost sales (by accounting for the demand transferred to similar products) as well as to capture such benefits of portfolio rationalizations as improved management of out-of-stocks or lower handling cost, the model recalculates all KPIs each time the assessed assortment is modified.

The dynamically calculated SKU evaluation criteria are then weighed to properly capture the retailer's goals for the evaluated category, and combined into a comprehensive score. Together with relevant qualitative factors (e.g. information about items which enjoy high levels of customer loyalty), the score determines the "best" assortment in the category. Results—sales, profits,

Criterion	Description
Annualized Recorded Sales Volume	Potential volume of sales if SKU is maintained in assortment (annualized and net of out-of-stocks)
Demand Trend	A score which reflects the potential of a given SKU (growing / level / decreasing share in category sales)
Annualized Recorded Sales Amount	Potential amount of sales if SKU is maintained in assortment (annualized and net of out-of-stocks)
Average Unit Margin	Average margin realized by a retailer per unit of given SKU
Annualized Profit	Profit realized by a retailer from sales of given SKU (annualized)
Margin **Net Cost to Shelf**	Profit realized by a retailer from sales of given SKU net additional cost-to-shelf from DC to store (holding, handling and transportation)
GMROI	Average General Margin / Return on Investment per SKU
GMROI Trend	Year-to-year trend displayed by GMROI
Incrementality	Percentage of SKU sales accounting for demand which had previously not been captured by any product from the assortment
Shelf Space Productivity	Margin per linear foot of retail space
Inventory Turns	Number of times inventory is sold over a period of one year

Table 1: SKU Evaluation Criteria

inventory turns, etc—are then used to define the composition of store shelf (amount of space dedicated to each carried category) which is most likely to support the retailer's strategic objectives.

In addition to automatically selecting the "best" assortment, the model can be used to project outcomes of predefined scenarios. Thanks to the tool, GoodsCo can e.g. forecast the results of eliminating an array of individual SKUs, a group of products sold under a common brand, or a set of items sharing the same functional characteristics.

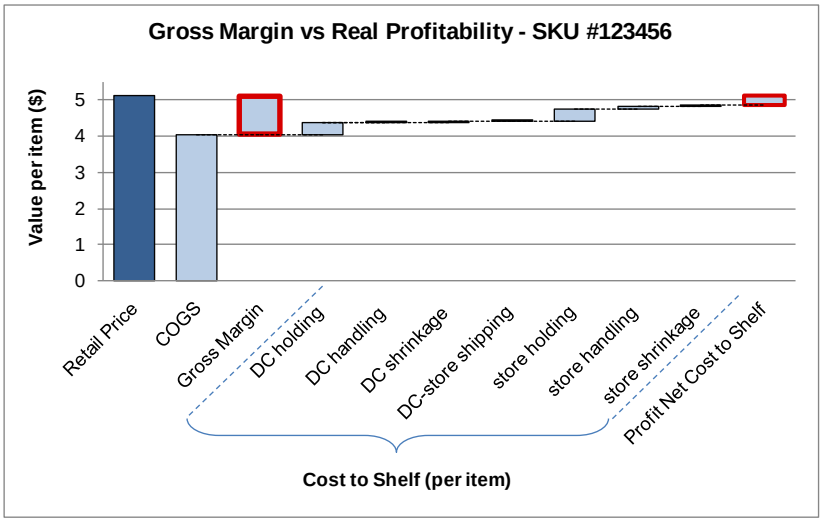

Figure 2: An example showing how the gross margin of a product can be consumed before the product is sold to the customer.

Results of Efficient Assortment

The Efficient Assortment Model assesses the risk of lost sales, quantifies possible improvements in product availability, efficiency of retailers' operations, and utilization of supply chain assets, as well as projects their revenues and profits. This new capability enables GoodsCo to support its clients' goals through adjustments in its product portfolio, as well as through sharing new data-based insights and suggestions regarding shelf management.

The EA Model can help GoodsCo detect which products in its portfolio are most profitable for retailers, considering costs of storing, shipping, and handling. Gross Margin does not account for logistics costs which occur after goods are delivered to retailers' Distribution Centers and therefore does not reflect their actual contribution. The model assesses these additional costs for each Stock Keeping Unit and estimates the portion of remaining margin - the Profit Net Cost to Shelf (an example is shown in Figure 2).

The tool allows the manufacturer to determine which of its products are likely to be successful given the retailers' objectives for their category of merchandise. It also lets GoodsCo simulate which SKUs are most robust against changes of these objectives and which items will be approved by various retailers. Figure 3 illustrates how modifying the category strategy (e.g. Strategy A is focused on sales' volume, Strategy C promotes high margins) can affect the

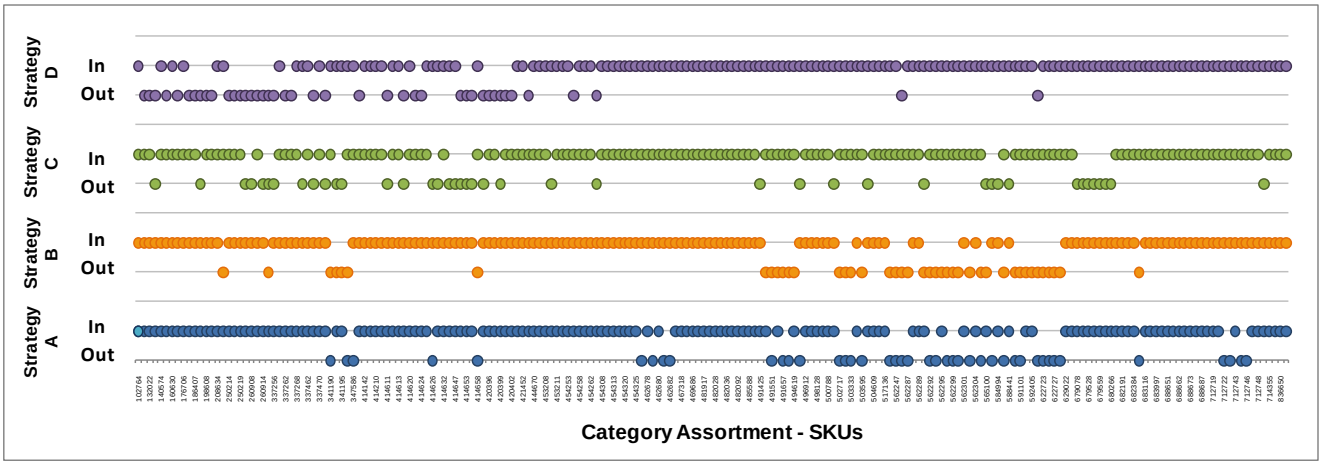

Figure 3: The decision to keep or eliminate a SKU depends on the goals which the company has defined for the category. A retailer will select a different subset of the category portfolio depending on which of the four strategies (A, B, C, or D) it applies to the category.

retailers' decision regarding which SKUs to maintain and which to eliminate. GoodsCo can use this capability to identify the products which are worth investing in, those which require efforts such as promotion or advertising, as well as those which should be discontinued.

The new tool can also be useful in testing more complex scenarios and finding more intricate solutions. Figure 4 illustrates a decision involving multiple categories of merchandise. The EA Model realigned the available shelf space among categories Fresh, Healthy, and Clean so as to maximize retailers' profits. The recommended change—extending the shelf space currently assigned to category Fresh while reducing the area where items from categories Healthy and Clean are displayed—allows the retailer to increase its income by almost 50%.

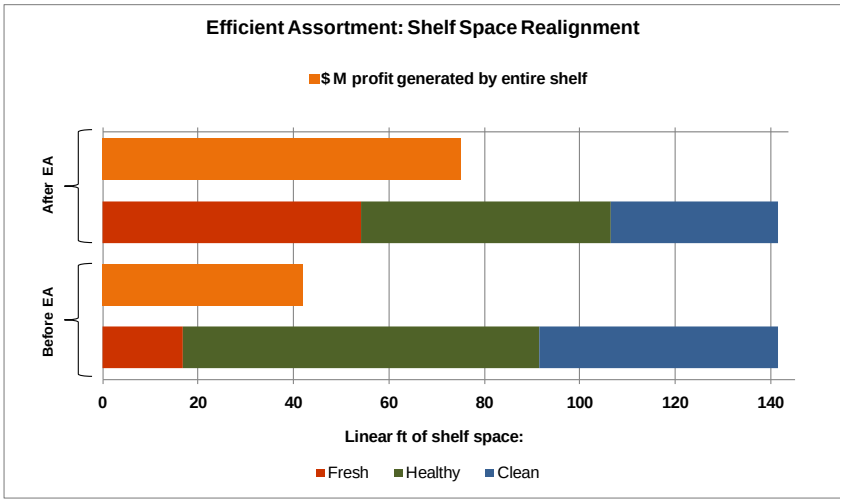

Figure 4: According to the EA model, if a portion of shelf space previously dedicated to categories Healthy and Clean is reassigned to category Fresh, the retailer will observe substantial improvement in annual profits earned from entire shelf.

Conclusion

The new decision model reinforced GoodsCo's competence to support objectives of its clients while pursuing its own goal of offering end-customers products which they need and trust. The extended partnership between the supplier and its clients will help channel funds and creativity to the most popular items. The manufacturer's involvement in the Efficient Assortment initiative will support more successful product development, thus helping in retaining its portion of store shelves. Finally, proactively managing the assortment will eventually allow the company to free its manufacturing and logistics network from servicing items that don't create much value to clients and customers.