Modeling Supply Chain Benefits of Efficient Assortment

by Marta Lew
May 25th, 2010

Agenda

- Research Background and Problem Definition
- Modeling Supply Chain Benefits of Efficient Assortment
- Results of Efficient Assortment
Research Background

Consumer Goods Companies are faced with the same challenges that their retailers are struggling with, including:

- Retail space growth slower than rate of new product introductions;
- Increasing variety of products offered in stores;
- Growing popularity of Private Labels and their attractiveness in economic downturn:
  - Retailers,
  - Customers.

**Change in number of items offered by average store (2009/2008)**

- Increased
- Stayed the same
- Decreased

**Private Label share | growth by department**

**USA - Number of Outlets vs New Product Introductions**

Source: Consumer Goods Technology, AMR Research (2009)
Source: Euromonitor International & IRI New Product Profiler
Source: Information Resources Inc.
Research Background

Consumer Goods Companies are faced with the same challenges that their retailers are struggling with, including:

- Retail space growth slower than rate of new product introductions;
- Increasing variety of products offered in stores;
- Growing popularity of Private Labels and their attractiveness in economic downturn:
  - Retailers
  - Customers

![Graphs and diagrams](Source: Consumer Goods Technology, AMR Research (2009), Euromonitor International & IRI New Product Profiler, Information Resources Inc.)

Problem Definition

The sponsor of this research wanted to be able to evaluate its product portfolio through the perspective of cooperating retailers.

In order to effectively and objectively deal with:

- Dozens of product categories,
- Hundreds of SKUs per category,
- Multiple retailers catering to different customer groups,
- Copious amounts of information provided by retailers:
  - Point of Sales data,
  - Financial data,
  - Operational data…

... the company needed to develop decision model which could be configured to cooperating retailers and categories of merchandise.
Agenda

- Research Background and Problem Definition
- Modeling Supply Chain Benefits of Efficient Assortment
- Results of Efficient Assortment

Efficient Assortment Model

The EA Model processes POS, financial, and operational data into KPIs reflecting objectives of retailers. These metrics are then used to select products for the rationalized portfolio. Results determine the shelf composition:
Benefits of Efficient Assortment

Benefits of SKU rationalizations captured in the Efficient Assortment Model include:

- Improved management of out-of-stocks (translating to higher total sales).

- Transferring of demand between eliminated items and their functional substitutes.

Benefits of SKU rationalizations captured in the Efficient Assortment Model include:

- Improved efficiency of retailer’s supply chain, translating to higher profitability of SKUs in the portfolio through lower “Cost to Shelf”, including:
  - Cost of storing products at DCs and stores
  - Cost of handling products at DCs and stores
  - Cost of shrinkage
  - Cost of transportation

Gross Margin vs Real Profitability - SKU #123456

Cost to Shelf (per item)
Agenda

• Research Background and Problem Definition
• Modeling Supply Chain Benefits of Efficient Assortment
• Results of Efficient Assortment

Improved Results of Retailers

By using the Efficient Assortment Model to support selection of discontinued Stock Keeping Units, manufacturers can help retailers increase profitability and improve operational efficiency, without sacrificing sales:

<p>| PORTFOLIO RESULTS - BEFORE EFFICIENT ASSORTMENT |</p>
<table>
<thead>
<tr>
<th># of SKUs</th>
<th>Annualized Recorded Sales Amount</th>
<th>Annualized Recorded Sales Volume</th>
<th>AVG Store In-Stock Rate</th>
<th>TOTAL Annualized Profit</th>
<th>TOTAL Profit Net Cost to Serve</th>
<th>AVG Shelf Space Productivity</th>
<th>AVG GMROI</th>
<th>AVG Inventory Turns</th>
<th>AVG Incrementality</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>5,000,000</td>
<td>$20,000,000</td>
<td>78%</td>
<td>$4,000,000</td>
<td>$3,000,000</td>
<td>$60.00</td>
<td>2.00</td>
<td>5.00</td>
<td>20.0%</td>
</tr>
</tbody>
</table>

<p>| PORTFOLIO RESULTS - AFTER EFFICIENT ASSORTMENT |</p>
<table>
<thead>
<tr>
<th># of SKUs</th>
<th>Annualized Recorded Sales Amount</th>
<th>Annualized Recorded Sales Volume</th>
<th>AVG Store In-Stock Rate</th>
<th>TOTAL Annualized Profit</th>
<th>TOTAL Profit Net Cost to Serve</th>
<th>AVG Shelf Space Productivity</th>
<th>AVG GMROI</th>
<th>AVG Inventory Turns</th>
<th>AVG Incrementality</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>4,805,660</td>
<td>$19,295,225</td>
<td>90%</td>
<td>$4,221,215</td>
<td>$3,249,716</td>
<td>63.32</td>
<td>2.19</td>
<td>5.13</td>
<td>22.7%</td>
</tr>
</tbody>
</table>

Absolute numbers have been disguised but reflect tendencies indicated by the EA model.
EA and Category Strategy

- Changes in strategy (goals) which the retailer expects a category of merchandise to support have a strong effect on assortment decisions.

A shift in retailer’s objectives (e.g. from sales volume to profitability) carries a risk of discontinuation for majority of items in one analyzed category.

Incrementality of Sales and EA’s Impact on Retailer’s Profits

- Incrementality of sales indicates how much of a given SKU’s sales are not expected to transfer to other products if it was discontinued.

- High incrementality of sales in a category increases the likelihood that rationalization of SKUs in the category will result in lost sales and diminished profits.
Cost to Shelf and Category Profitability

SKU rationalization can help reduce the aggregate Cost to Shelf of a category, thus increasing retailers' net profits.

- Example: profits generated by category Fresh can increase through a change of product mix. Category Healthy will generate a comparable cumulative gross margin after rationalization as before but will be less costly to handle. Finally, EA can help category generate a modest profit.

Shelf Space Allocation

The Efficient Assortment Model can be used to determine the allocation of shelf space between categories which will best support the retailer’s strategy.

- Example: 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 the entire shelf.
### SKU Evaluation Criteria

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

### Estimating Cost of Shrinkage

- **Inventory held at DCs (value)**
- **Inventory held at stores (value)**
- **TOTAL COST OF PRODUCT SHRINKAGE**
- **Average industry shrinkage rate**
- **Distribution of shrinkage between store-level and DC-level**
- **Size / weight of individual item**
- **Attribute of product**
- **Industry data**
- **Expressed in USD**
Estimating Cost of Transportation

- Inventory held at DCs (units)
- Inventory held at stores (units)
- Quantity of product sold
- Quantity of product moved between DCs and stores (units)
- Average distance between DC and serviced stores
- Average shipping rate (USD per truck-mile)
- Trucks of product moved between DCs and stores
- Totes of product moved between DCs and stores
- TOTAL COST OF PRODUCT TRANSPORTATION

Expressed in USD
Expressed in miles

Estimating Cost of Handling

- Inventory held at DCs (units)
- Inventory held at stores (units)
- Quantity of product sold
- Quantity of product handled at DCs and stores (units)
- Average duration of activities performed at the DC on each:
  - Item
  - Case
  - Tote
  - Stack of totes
  - SKU
- Total weekly duration of DC replenishment activities
- Average wage of DC worker
- TOTAL COST OF HANDLING PRODUCT

Expressed in USD
Expressed in hours
Seasonal Shelf Reconfiguration

Changes in shelf configuration and expected improvements of results

- Annualized Recorded Sales Vol
- Annualized Recorded Sales Amt
- Total Annualized Profit

<table>
<thead>
<tr>
<th>Type of planogram change</th>
<th>January - June</th>
<th>January - June</th>
<th>January - June</th>
<th>January - June</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in results from shelf reconfiguration: Baseline</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annualized Recorded Sales Vol</td>
<td>110%</td>
<td>120%</td>
<td>130%</td>
<td>140%</td>
</tr>
<tr>
<td>Annualized Recorded Sales Amt</td>
<td>110%</td>
<td>120%</td>
<td>130%</td>
<td>140%</td>
</tr>
<tr>
<td>Total Annualized Profit</td>
<td>110%</td>
<td>120%</td>
<td>130%</td>
<td>140%</td>
</tr>
</tbody>
</table>

Type of planogram change