Demand Segmentation: One Size Does Not Fit All!

Introduction

Our experiences dictates that all data within your supply chain are not the same. In fact, treating every data the same way may decrease the accuracy of the forecasts, as you might apply only one forecasting method across your product portfolio, not realizing that each product or group of products has different data patterns. Segmentation of your products or product groups will determine the forecast method and algorithm(s) you have to use during your Demand Planning/Forecasting process.

Before we go deeper into this segmentation and the process you have to follow, I would like to explain the fundamentals of forecasting models:

- The more random variations there are in the data, the more difficult it is to forecast
- Sophisticated models are not necessarily better than simple ones
- Combination of models (expert models used in forecasting tools) are not necessarily better than single models

- There is no magic model in forecasting
- No two models give the same forecast
- Forecast models age with time, periodic evaluations should be conducted
- A model can be improved but there is a cost involved in optimizing your forecast tool
- Working with exceptions and managing these exceptions will improve the forecast
- A statistical forecast is an average forecast
- Summarized you can say that three things are important: Try and Error, Focus and Segmentation.

How can we improve our Statistical Forecasting by using Demand Segmentation?

Demand Segmentation Process is the process of dividing a large data set into various small data sets which have more or less similar or related characteristics based on several dimensions or combination of dimensions.

Define a clear segmentation policy based on revenue, cost, demand volatility and product life cycle. Most common segmentations are based on Products/Customers/Suppliers/Market or combinations of these.

Example: A segmentation policy which is often used is the Product Portfolio Management Policy. Using Multi-Dimensional ABC Analysis (value to the company and forecastibility) you will have the following result:

This Product Portfolio Segmentation will determine for each of these 4 segments different algorithms to be used:

Risk/New Products High Value Low Forecastability	**-Structured Judgement** • Data Mining, Clustering, Time Series Models **-Sales Forecast Composites** **-Independent Judgement** **-Delphi** **-Industry Specific** **Forecastability**	**-ARIMAX** **-Multiple Linear Regression** **-Dynamic Regression** **- Industry Specific**	**Strategic/** **Fast Moving Products** High Value High Forecastability
Slow Moving Products Low Value Low Forecastability	**-Weighted Combined Models** • Judgement, Time Series Models, Causal **-Non Seasonal Exponential Smoothing** **-Double Exponential Smoothing** **-Moving Averaging** **-Crostons Intermittent Demand** **-Industry Specific**	**-ARIMA** **-Decomposition** **-Exponential Smoothing** • Multiplicative • Additive • Linear Damped Trend **- Industry Specific**	**Flow/Mature Products** Low Value High Forecastability

Company Value (vertical axis label)

Demand Segmentation Steps:

- Define a Segmentation Policy or Policies
- Define a data set to do the Segmentation Analysis
- Run the Segmentation based on the Multi-Dimensional ABC Analysis
- Check which Algorithm(s) can be used. Check also specific industry algorithms which can be used as basis to change the algorithm based on your specific requirements
- Run Forecast in your forecasting tool/software and compare the different results
- Come to a consensus within the company (supply chain/manufacturing/finance...)
- Change accordingly the consensus algorithm in your forecasting tool/software
- Try and Error
- Keep the focus based on your products life cycle and changes within your supply chain

What are the benefits?

- Segmentation benefits that run across the entire supply chain, from your demand planning process over manufacturing to logistics:
- Companies can increase forecasting accuracy by 10% to 15%. According study AMR: every 3% increase in forecast accuracy increased the profit margin by 2%
- Inventory reductions of 10% to 30%, less working capital
- Freeing up Demand/Inventory Planners so they can focus on higher-priority segments and engage in higher-value activities
- Improvement of the other supply chain planning's such as Master Production Scheduling/Material Requirements Planning
- More efficient manufacturing through avoiding last-minute changes
- …

Conclusion

Demand Segmentation can be a significant advantage for a company's supply chain and it is prerequisite for an efficient Demand Planning/Forecasting Process. Beyond stanching waste and unnecessary expenditures, it can help boost profitability—by redeploying resources more wisely, generating new insights, quick response to changes in the market and helping to get the most value out of each product.

Xeleos Consulting and Optimact can help you in this field as we have the knowledge to translate your Demand Strategy into a Demand Segmentation Policy with immediate benefits by using Optimact.

Gunter Fonteyne Partner Xeleos Consulting/Optimact, gunther.fonteyne@xeleos.com