

INCORPORATING PREDICTIVE ANALYTICS

WITH THE DEMAND SIGNALS TO AND FROM TRADE PROMOTIONS



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Background on Promotion Philosophy

Trade promotions management is most commonly considered the ability to plan and track promotional events to ensure that the payments that are made to the trade are within the contractual, budgetary and policy constraints of the business. Trade funds (spend) is the bucket of money allocated by a business to fund discounts and cooperative activity with the trading partners (wholesalers and retailers) in the supply chain from the manufacturer to the consumer. Trade funds are generally broken into three categories:

- **Trading Terms** - this is rate based on monies - relative to some or all of the sales
- **Fixed Money** - this is a lump sum payment for funding particular activities. It is sometimes referred to as Co-op, Gate Fees, Lump Sum.
- **Case Deals** - this is a rate based discount or payment on a particular activity (promotion).

In assessing the effectiveness of trade funds in each of these categories it is fundamental to understand two components of the demand signal;

- **Baseline Sales Rate** - this is the forecast sales rate when there is not promotional activity.
- **Uplift** - this is the sales rate over the baseline that occurs when a promotional event is implemented.

The efficiency (the extent to which trade spend is minimized) and effectiveness (the extent to which trade spend achieves an increase in sales or profit) of the application of trade funds can only be assessed if data streams of these two measures are

available.

To optimize the utilization of trade funds it is important to have reliable demand signal data available that is sourced from a point that is as close as possible to the consumer. In most markets around the world this data is derived from Point Of Sale (POS) devices and is commonly referred to as “scan data”. Unfortunately, this POS data is not available for every customer and product that is sold by a typical consumer products company. This being the case, how does a CPG (Consumer Product Group) business tackle the optimization challenge if a large proportion of the data set is missing?

This paper will shed some light on how Promax PX can conquer this challenge and provide a stream of quality multi-causal demand signal data on which predictive analytics can be used to optimize trade promotions.

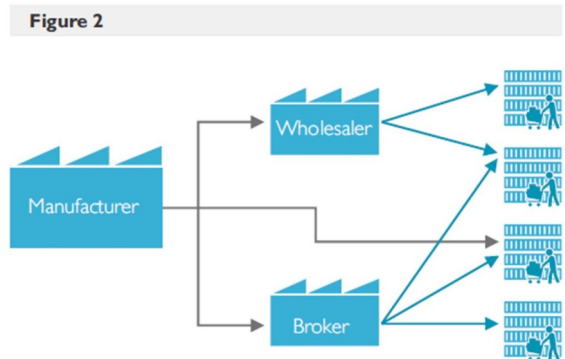
The Customer and Product Landscape

Most companies in the consumer products industry have a diverse route to market (Figure 1). It involves relationships with large grocery retailers, brokers, foodservice, independent retailers, wholesalers and direct store route distribution, to name a few. The only consistent source of data is usually derived from invoice line history. However, this data does not reflect the demand signal from consumption and is distorted by the inventory policy and ordering pattern of the parties in the supply chain between the manufacturer and the consumer. Although statistical analysis of this data can be used to produce predictive models the accuracy of these predictions is low and it is difficult to be able to reliably separate the baseline signal from the uplift signal.

POS data often is available from large retailers or syndicated data suppliers. In some instances this data stream contains more information than sales value and volume and can thus contribute to a multi-causal statistical analysis that can produce high quality predictions of both baseline and uplift. However there are two problems, firstly this data is not available from all retailers and secondly multi-causal data is often based on survey information that analyses a portion (sample set) of the demand and extrapolates that to the entire dataset.

Distributors, brokers and wholesalers may provide their warehouse withdrawal data which often reflects a better picture of the consumer activity. This information is not perfect for predictive analytics although it can be used in preference to invoice line history from the manufacturer.

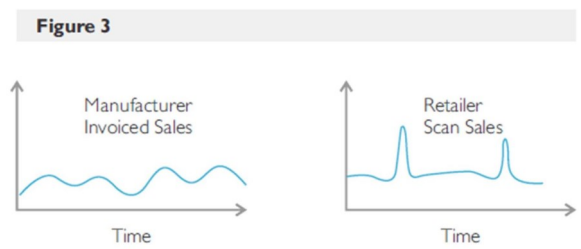
Within the customer landscape the route to market is not always as straightforward as depicted in Figure 1. Promotions and supply chain are created at various levels within the transactional pathway. Promotions and claims are generally related to encouraging the consumer towards the promoted product and buy more than they would have otherwise. A demand signal may not be available at the retailer level and may be disguised by the wholesaler with the manufacturer only seeing the “off invoice” demand. As can be seen by Figure 2, retailers can procure stock through multiple sources, direct from the manufacturer, or through a collection of wholesalers and distributors. This can often vary depending on the deal.



Data Feeds

Invoiced Sales

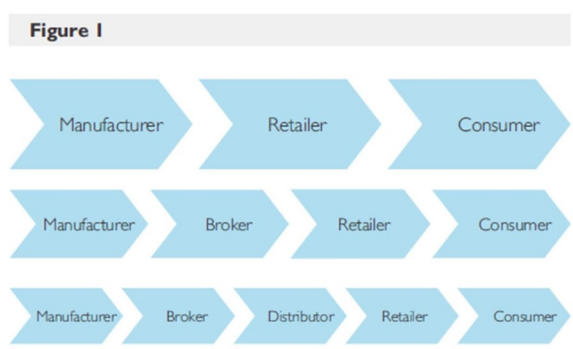
Invoiced sales data is available in those instances where the manufacturer has a direct relationship with the procuring organization.



In Figure 3 above, the issue of the disguised consumer sales pattern can be seen. The invoiced sales data makes it difficult to define the baseline and uplift.

Warehouse Withdrawal

Invoiced sales data is available in those instances where the manufacturer has a direct relationship with the procuring organization.





Trade Promotion Settlement Data

When a manufacturer plans a promotion, key pieces of information are recorded. Among this dataset are timing, volume and pricing data for the transaction between the parties. With Promax PX this data is comprehensive and records a range of dates which define the timing supply chain impact, the profile across the buy period, the dates when the promotion will be valid for the consumer and their profile of the consumption pattern during the promotion. Promax PX is also aware of the anticipated baseline either side of the promotion. When planning a promotion in Promax PX there is a choice of manually defining the uplift or using the predictive analytics to estimate the sales and volume as a result of the price point and other causals for the event.

When the promotion is completed there is a phase in the workflow for the settlement of the transaction. At this point the parties agree on an amount, related to the volume/sales on which the transaction is to be settled. This is a point in time where the quality of the information that is recorded is most pristine. The business is signing off to pay money! It surely would not be paying money if it did not agree with the parameters of the transaction.

During this settlement phase of the workflow, Promax PX provides the opportunity to capture and confirm key statistics about the promotion that then can be used in deriving or fine tuning to predictive models within the system. This is embedded in the “Evaluation” phase of the Promax TPM workflow.

Creating Pseudo-scan Data

Where scan (POS) data is not available we can use the capabilities of Promax PX’s data capture during the Evaluation phase of the closed loop Trade Promotions Management cycle. This creates data that is aligned with the timing of the promotion, an accurate reflection of uplift, and a statistically sound method for deriving

baseline sales. To the Promax PX database, this data conversion looks to the modelling environment, like scan data. In addition Promax PX also records any characteristic that the user may wish to capture that may have a causal effect on the promotion’s performance. As the process in Promax PX requires the Account Manager to focus on confirming the characteristics of the promotion in the “Evaluation” phase of the promotion management workflow, this causal information is of exceptionally high quality. Typically they would confirm the supporting characteristics such as display or advertising support. Did the retailer adopt a promotion as it was planned? If the original transaction was based on an agreement to provide an aisle end, then did we get that? The Account Manager should know this information. This information is of far higher quality than survey data as it is verified from within your organization. Other data confirmations such as percentages of stores participating in the activity or competitor activity can also be recorded at this point, enriching the repository of data on which future multi-causal models can be created.

The scan data and pseudo-scan data can be embellished through this additional causal information providing a rich source for predictive analytics of Promax PX. The results are an impressive improvement in forecast accuracy achieving a better application of trade funds and a much more efficient supply chain.

Dealing with Indirect Customers

With Indirect Customers we have a need to forecast the demand and accruals for trade spend for each retailer even though we, as the manufacturer, do not have direct involvement with the supply transaction to the retailer. It passes through another party. In Promax PX we call this retailer and indirect customer. The challenge is to translate the demand from being wholesaler centric to a retailer level, while recognizing that the retailer can purchase from multiple sources. The manufacturer needs to resolve which proportion of the demand is being generated from the direct relationship and how much comes from the indirect relationship (s). Ultimately we want to understand the value of our relationship with this indirect customer, considering the multiple sources on which it obtains the manufacturer’s products.

Through an analysis of the historical data we are able to define parameters in Promax PX that define the split between the wholesalers and the direct suppliers.

Figure 4

Wholesaler	Retailer	Product	Percentage
Jones Family Wholesalers	711 North-East Region	Baked Beans & Sausages	53%
Jones Family Wholesalers	711 North-East Region	Baked Beans & Tomato	59%
Smith & Co Wholesalers	711 North-East Region	Baked Beans & Sausages	47%
Smith & Co Wholesalers	711 North-East Region	Baked Beans & Tomato	22%

In the table in Figure 4 we can see that the 7-Eleven stores in the north-east region are supplied by two wholesalers and directly from the manufacturer. In the case of the Baked Beans & Sausage, 100% is derived from the wholesalers whilst in the case of the Baked Beans & Tomato the percentage does not sum to 100% indicating that 19% is supplied directly from the manufacturer.

With this information, Promax PX can compute a forecast for each of these products, a correct accrual for the retailer and wholesaler to ensure that payments and deductions are managed in line with the contractual agreements. In addition Promax PX can create pseudo-scan data for the retailer if it is not available directly from the POS collection point.

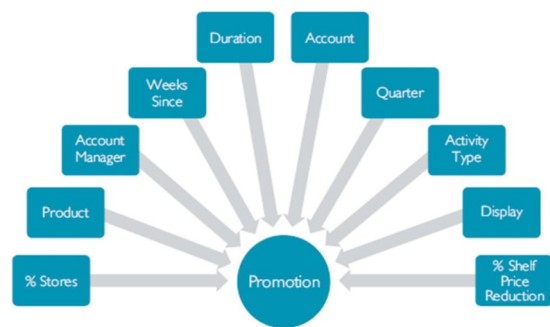
Capturing Causal Information for Predictive Analytics

The amount of data that can be collected around sales activity is only limited to the user's imagination and its availability. Generally there is more data available than there is capacity to process or understand. Collecting the right information that offers insight into the drivers behind the demand signal is a complex subject. However, one way to distil the information when thinking about trade promotions is to set the test about whether or not the information is truly independent and an

independent variable that drives the demand and can be used as a parameter in establishing a prediction of future demand. As shown in Figure 5, there are examples of the sort of causal information that could be used in a prediction process. Aspects like seasonality, display, activity type, level of discount are all examples that are known characteristics of the planned promotion.

Examples of things that are not know or "guessed" are parameters like the weather and competitor activity.

Figure 5



The usefulness of promotion characteristics is enhanced by an ability to be able to collect depth about the character. What we mean by this is an ability to be able to define a grading of a causal characteristic. An example may be the Display causal. When an item is promoted its presentation position within the store may be changed. The baseline, or non-promoted characteristic could be classified as "shelf". A first level promotion type, maybe to tag the item in its current position, indicating to the shopper a reduction in the shelf price. This classification could be "tagged". A more costly promotion may be to expand the facing or place the item in a bin in the aisle way, we could classify this as a "bin". And lastly the most expensive investment may be an aisle end display which we could classify as an "end".

Figure 6

"Display" causal characteristic	Score
Shelf	0
Tagged	12
Bin	54
End	120

In conjunction with the help of the Wipro Advanced Analytics team, the collected data can be further analysed and applied to the predictive analytics models for future use in planning promotions.

The quality of this data is superior in many respects to that obtained by survey and extrapolation as it is verified from within your organization and has a grading associated with it that reflects the characteristics of the causal information. Much of the syndicated data available does not provide this granularity or if it is available then it is very expensive to purchase. Typically the syndicated data would record for the causal characteristic "Display" a value of either 0 or 1, in other words there is a display or there was not one. It doesn't give the richness of data Promax PX can provide to further define what type of display. Although we use display as an example in this paper, it can refer to any causal characteristic.

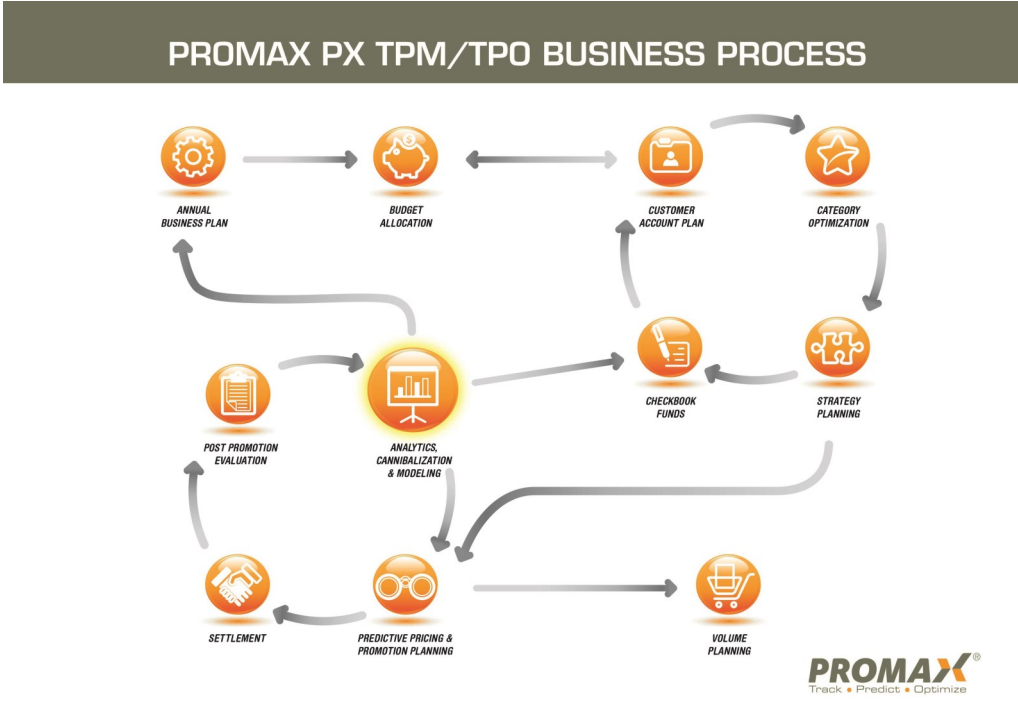
Using the Data in a Closed Loop TPM/TPO Business Process

The single largest barrier to implementing a "whole of business" trade promotions management and optimization project is the lack of data on which optimization and predictive models can be

created. The Promax PX business process as described in the diagram below, closes the planning and execution loops, captures the data and continually improves the quality of the planning process.

From the development of a business plan derived from historical performance and/or future forecasts, Promax PX will facilitate the creation and allocation of budgets, allow the development of multiple scenarios to test business strategies, develop customer account plans and facilitate the tactical development of a promotional plan for every product and every customer. At the heart of this process is Promax PX's predictive analytics and multi-causal modelling.

A predictive multi-causal statistical model can be developed for every product and every account you trade with. This means that you can plan promotions for direct and indirect customers, wholesalers or any other party you define within the transactional supply chain. There is no additional effort in creating a promotion just a vast improvement in the confidence and accuracy of predictions about the effectiveness of the trade spend.



About Wipro Promax Analytics Solutions

Wipro Promax Analytics Solutions (WPAS), a Wipro Group Company, is a world-leading specialist in Trade Promotion Management, Forecasting & Volume Planning, Customer Account Planning & Budgeting and Modelling & Trade Promotion Optimization. With headquarter operations based in Australia and offices in North America, United Kingdom, Central Europe, India and New Zealand, WPAS boasts an impressive stable of global consumer goods companies. Promax solutions are the result of more than twenty-four year's experience working in close collaboration with leading consumer goods manufacturers, retailers and distributors.

The Promax PX solution has been designed to allow a seamless, automated process to Track, Predict and Optimize promotions and trade spend. It incorporates the most sophisticated tools to maximize a client's return on trade spend investment, and deliver optimal outcomes for retail partners.

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