

The below articles were authored by Luke Tomkin from GRA and published as a series in Logistics Magazine

### Article One:

#### Retail Demand Planning: What fits best?



Few would argue that demand planning directly and significantly impacts retail business profitability. Just think, how often can missed sales or excess inventory holdings – leading to lost revenue and wasted investment – be traced back to poor forecasting?

The quality of decision making in the areas of purchasing, replenishment and sales planning has a direct and undeniable impact on business ROI.

While employing effective demand planning processes in a retail environment is increasingly considered essential, the best approach is not always clear.

#### **Top Down or Bottom Up?**

Retail demand planning methodologies can be divided into two schools of thought: Top Down or Bottom Up. Top Down entails demand planning at a summary level and a subsequent allocation or 'pushing down' of demand to products and stores to support replenishing and purchasing activity. The Bottom Up methodology involves the generation of forecasts at the lowest possible level (e.g. product by location) to support execution activity and the aggregation of these forecast to support higher level demand planning requirements.

'Top down' is often the choice for retailers with short life cycle products and industries in which history has little relationship to the future, such as high fashion under certain circumstances. Note however, that these circumstances can easily be overstated; think of an established brand that sells business shirts – last year's shirt sales can often be effectively used to predict next year's sales. Even in cases where past performance is no predictor of future outcomes, businesses still need to purchase and replenish on a product basis so Bottom Up decision making must be entered into at some level.

In the majority of situations however, a Bottom Up demand planning methodology offers the potential for far superior business outcomes. Even so, a massively disproportionate number of retailers currently use the Top Down approach. Why is this? It is due in part to historical limitations in technologies and the sophistication of previous processes that did not support the more demanding

(pun not intended!) Bottom Up methodology. However, with recent advancements in these areas, the Bottom Up method is gathering momentum with progressive and savvy businesses looking to reduce their cost to serve, improve service levels and reduce inventories.

As part of a series of articles we will discuss the suitability of Bottom Up demand planning for retail environments, examine challenges and pitfalls in its implementation and assess the benefits it offers over the traditional Top Down method.

Next month we frame some of the demand planning challenges that are common across retail businesses in 'Retail Demand Planning – A Tough Sell'.

## Article Two:

### Retail Demand Planning: A Tough Sell



In last month's article, the first in this series on Retail Demand Planning, I introduced the concepts of Top Down and Bottom Up forecasting and discussed reasons why the Top Down approach is currently more prevalent. This second article, *A Tough Sell*, outlines some of the demand planning challenges that are common across retail businesses. These challenges can be so daunting that they often halt demand planning evolution within a business, preventing the process advancement required to continually improve performance.

In designing demand planning strategies for retailers, it is important to identify and acknowledge the key challenges that demand planners face, rather than accepting them as a *fait accompli* – that is, unresolvable issues that must be lived with. While perfect solutions do not always present themselves, advances in technology and planning processes are creating solutions to problems that were once considered insurmountable.

It is important to note that retail demand planning *is* challenging – more so than many other industries would realise. Retailer challenges stem from both the nature of their sales and the characteristics of a retail business. Listed below are some of the key factors that commonly generate complexity in retail demand planning:

- high Stock Keeping Unit (SKU) counts often with a long "tail" of products,
- large numbers of stocking locations (ie stores and distribution centres),
- stock presentation requirements in stores,
- the impact of "out of stocks" on sales history data,
- frequent and numerous small volume transactions (ie customer sales),
- shorter product life cycles,
- seasonal and / or erratic sales patterns, and
- significant and frequent promotional activity.

These characteristics create a specific set of requirements that any retail demand planning solution must address. These requirements include:

- a sophisticated (as opposed to complex) automated forecasting system requiring minimal user input to generate reliable forecasts,

- the capacity to store, transfer and process large data volumes quickly,
- the facility for significant amounts of 'market intelligence' to be input into the system (eg promotional planning, competitor activity),
- a range of forecast algorithms suited to the wide variety of demand patterns experienced in a retail business (eg seasonal, erratic, slow moving),
- an intelligent performance reporting framework, and
- a demand planning exception management approach that allows planners to identify and target (a) questionable forecasts and (b) focus on high value or critical lines.

It's a tough set of requirements to meet, but with technology improvements and more sophisticated supporting processes, progressive businesses are meeting these challenges successfully and markedly improving performance. Given that this is where industry is headed, businesses that continue to treat the symptoms versus the causes are missing an opportunity to improve service levels whilst reducing cost to serve – an opportunity that could be exploited by a competitor.

Next month I will compare Top Down and Bottom Up demand planning in more detail and explain why each process has a definitive impact on service, inventory and cost performance. I will take a deeper look into the lure of Top Down demand planning and reveal why it is not as simple as it first seems in *Top Down – Simplicity or just Hidden Complexity?*

## Article Three:

### Retail Demand Planning: Top Down – Simplicity or Just Hidden Complexity?



In this series on demand planning, forecasting approaches for retail businesses are being examined. Two approaches were introduced and defined in the first article as Top Down (aggregate level forecasting) and Bottom Up (store level forecasting) demand planning. In the second article I discussed why the Top Down approach is currently more prevalent, and looked at some of the significant challenges inherent in retail demand planning.

In this third article, I examine the Top Down approach and discuss why one of its principal allures - its simplistic approach to demand planning – creates complexity, inefficiencies, and additional workload throughout the distribution network. Specifically, I will look at how Top Down forecasting influences a business' ability to:

- (i) purchase the right stock into the business, and
- (ii) replenish the right stock to stores.

### Purchasing

Diagram 1 below provides an example of how an aggregate level forecast is often matched to a distribution network.

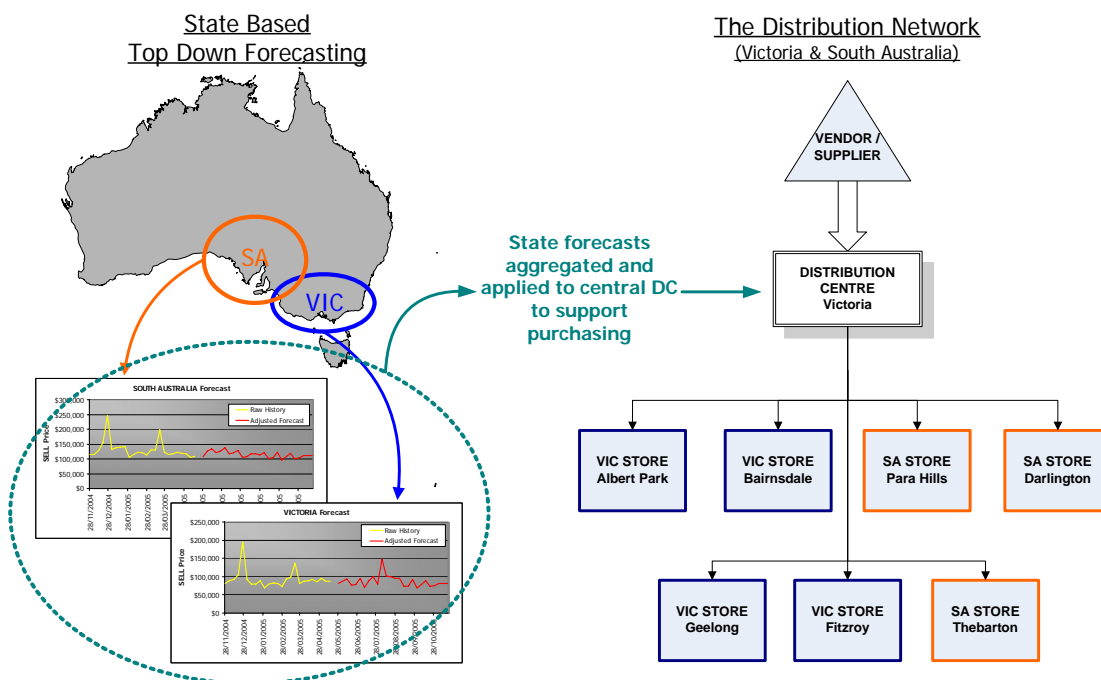


Diagram 1 – Top Down: State Based Forecasting and the Distribution Network

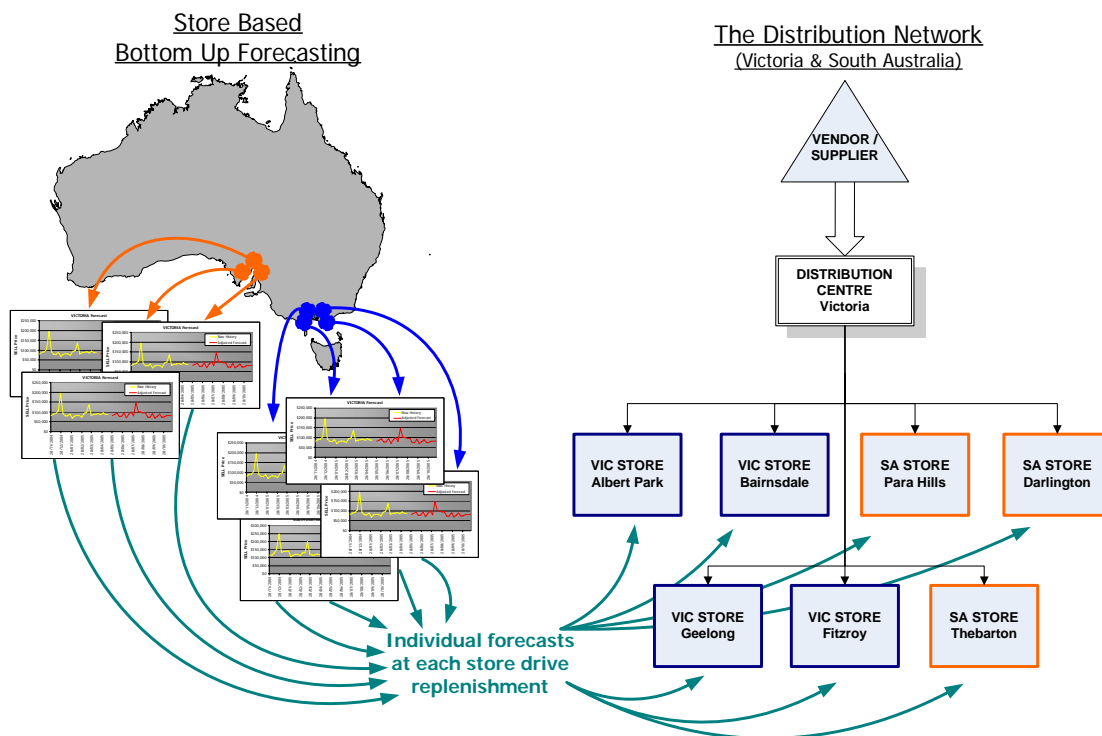
In this example, stores in both states are supplied by a central Distribution Centre located in Victoria. The business aggregates the state sales forecasts and applies it to the central Distribution Centre to drive purchasing. While using aggregate forecasts to assist purchase order creation is useful, it does not paint a complete picture. What the business is going to sell, and what and when it needs to buy is not a one-for-one relationship.

At a fundamental level, purchase requirements are influenced by three factors:

- future sales,
- current stock position of the stores versus the desired stock position, and
- the store lead-times.

The Top Down approach of applying an aggregate forecast at a DC level misses the last two of these factors, which can lead to too much or too little stock arriving too early or too late. Excess inventory holding or missed sales are the natural consequence.

Businesses need to have future visibility of store replenishment requirements to accurately manage inventory holdings and purchasing. This is only possible using store level, or Bottom Up, forecasting techniques (see Diagram 2 below) and teaming it with Distribution Replenishment Planning logic. This will be discussed in more detail in the next article.



**Store Replenishment**

As discussed, aggregate level forecasting cannot be used to drive store replenishment; another method is required. Most often the “Min / Max” replenishment approach is relied upon - the store requests a fixed quantity once a certain onhand trigger point is reached. With constant sales this results in a neat ‘saw tooth’ stock movement at the store (see the left hand side of the Diagram 3 below). However, when faced with volatile sales patterns (such as seasonal or promotional activity) the result is quite different. The impact of a variable sales pattern on the store stock position is illustrated on the right hand side of Diagram 3 below.

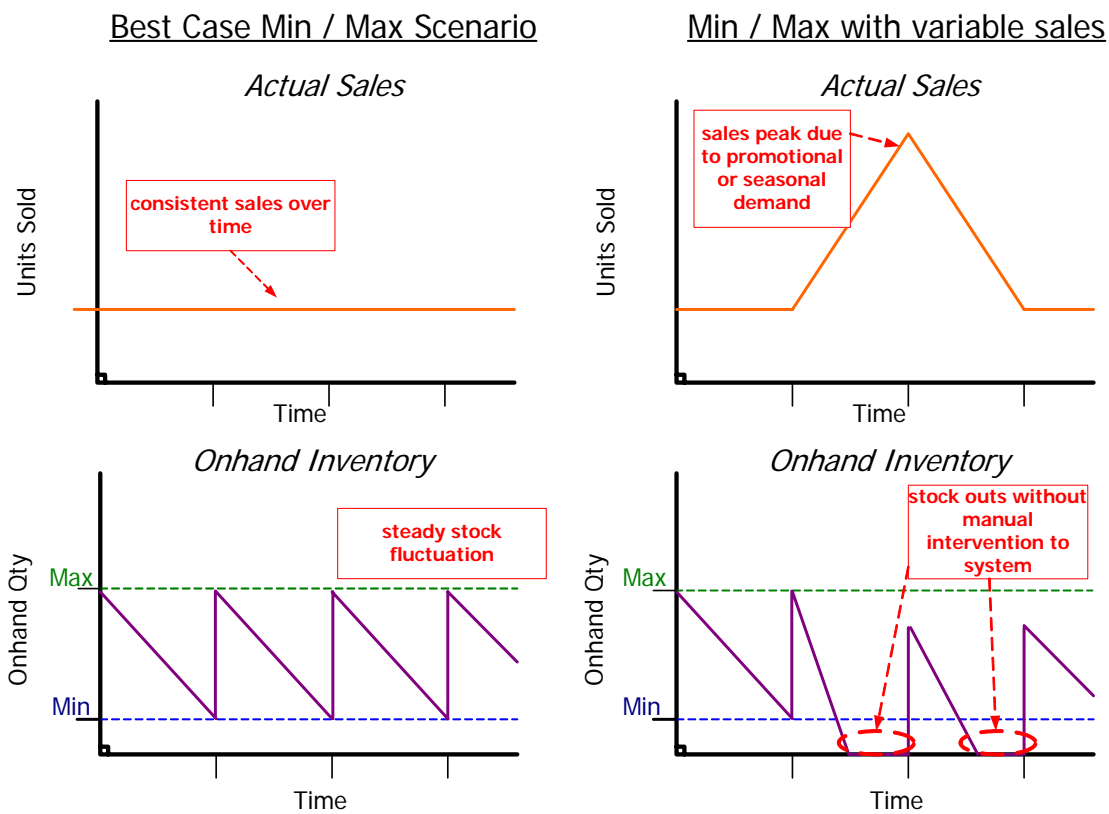


Diagram 3 – Min / Max stock position under different sales conditions

The example on the left provides a ‘Best Case’ scenario, where sales are consistent over time. The example on the right shows the impact of a sales peak on your stock position – a promotional or seasonal peak drives the store to a stockout position and likely missed sales.

In a seasonal or promotionally intensive environment either the Min is set high enough to meet peak demand, and the business carries unnecessary stock throughout the year, or it is set lower than

peak demand (as in the case above) and faces missed sales. Either outcome reduces the profitability of the business.

The Top Down approach provides up front simplicity for demand planning - only an aggregate level forecast is required. But this simplicity creates avoidable costs throughout the rest of the supply chain. Purchasing and store replenishment are not integrated, capacity management is hindered by lack of future visibility, significant inefficiencies exist in meeting seasonal / promotional demand, and stocking requirements at stores do not automatically adjust to changes in sales patterns. Next month's article explores how a Bottom Up demand planning approach can surmount the difficulties discussed here, and support a cost optimised supply chain.

## Article Four:

### Retail Demand Planning: Letting Sales at Stores drive the Supply Chain



Last month's retail demand planning article examined some of the implications of aggregate Top Down forecasting in a retail business. In this article, the merits of customer demand driven planning underpinned by store level or "Bottom Up" forecasting are discussed. Three key advantages of this Bottom Up demand planning approach are described below.

#### ***Store replenishment driven by customer demand***

As discussed in last month's article, a "Min / Max" approach is typically relied upon in absence of a store level forecast. The Min / Max approach simply looks at available stock to determine a replenishment requirement. What is going to be sold tomorrow, or even later that day, is not considered. By forecasting at a store level, both stock position *and* future customer demand can be used to determine replenishment requirements. Having future visibility of demand and replenishment requirements by week or day into the future is essential for maximising sales potential and avoiding lost sales, especially for promotional or seasonal lines where sales from one week to the next can vary dramatically. An effective store level or Bottom Up forecasting approach:

- ⇒ *reduces missed sales by pre-positioning stock prior to customer demand, and*
- ⇒ *is essential for seasonal and promotional sales noting that Min / Max techniques do not recognise weekly or daily sales variations into the future.*

#### ***Store inventory holdings unique to each store's demand profile***

The 'one-size fits all' or store grading approach common to store stocking policies in a retail network can be eliminated. Inventory held at each location becomes specific to that store's customer demand requirements, down to a product level. Without this level of precision, it is not possible to deliver consistent service levels across the network, optimally balance inventories and minimise supply chain operating costs. An effective store level or Bottom Up forecasting approach:

- ⇒ *can be used to optimise stock holdings on a store by store basis, and*
- ⇒ *deliver consistent service level performance for all items in all stores.*

#### ***A synchronised supply chain***

By planning demand at a store level, there is no need to forecast at distribution centres, nor estimate purchase order requirements. Distribution Replenishment Planning (DRP) can be used to roll up store level replenishment requirements to the distribution centre or warehouse level, thereby removing assumptions and aligning stocking, replenishment and purchasing through an integrated planning methodology. Error associated with translating a sales forecast at an aggregate level to store replenishment requirements is eliminated. Importantly, alignment of supply chain processes

delivers a 'single set of numbers' for sales, finance and supply chain functions. An effective store level or Bottom Up forecasting approach:

- ⇒ supports full Distribution Replenishment Planning
- ⇒ integrates replenishment, purchasing and forecasting processes
- ⇒ reduces error at each node in the supply chain, and
- ⇒ coordinates management control with greater precision and less effort.

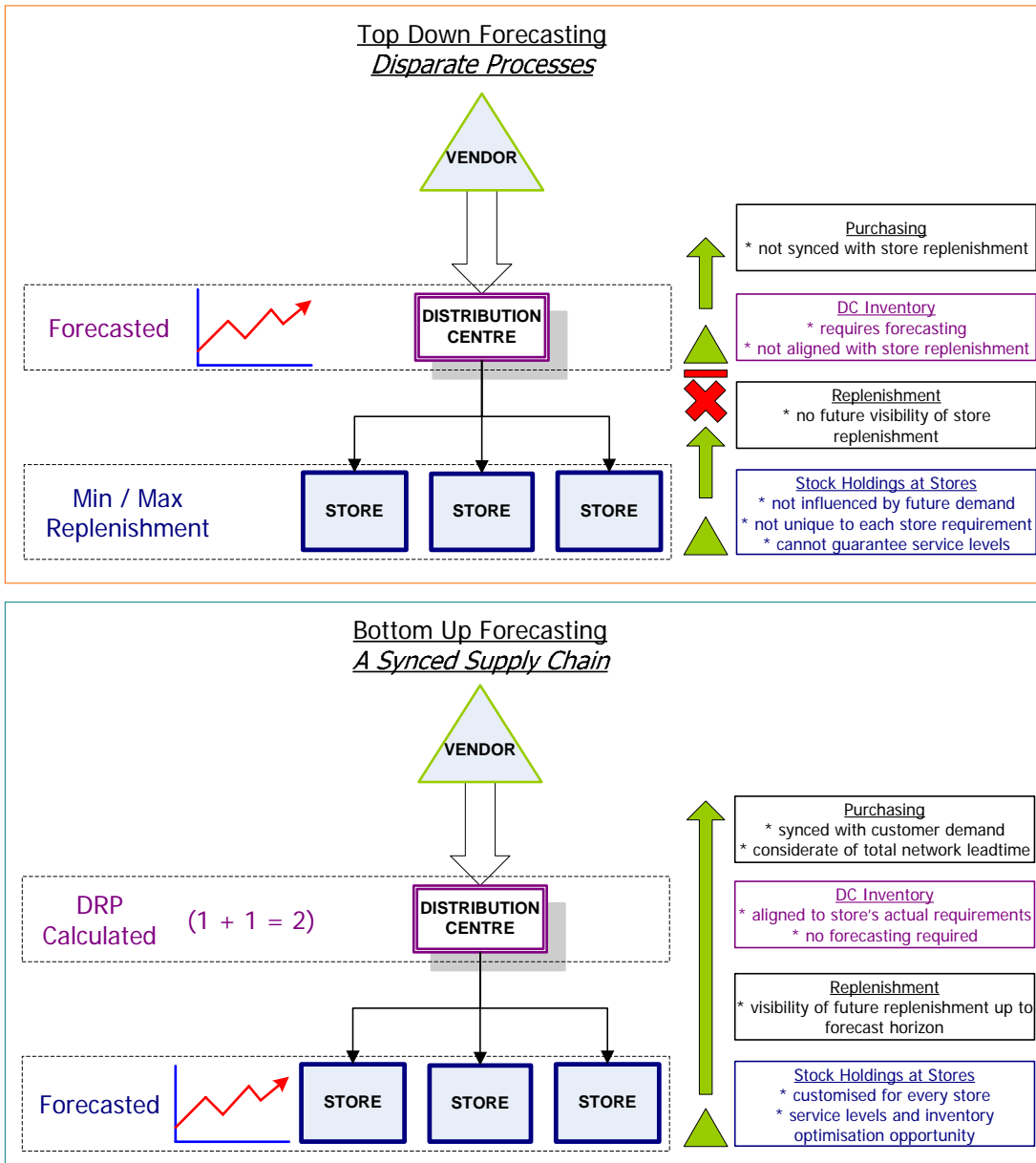


Figure 1 – Supply chain process relationships under Top Down & Bottom Up forecasting techniques

In summary, a Bottom Up supply chain planning methodology creates opportunities to:

- employ true DRP,
- optimise service levels and costs,
- adapt operational plans to different future scenarios,
- manage seasonal, erratic and promotional demand patterns, and
- provide more flexibility in managing to each stores' own sales patterns.

The business gains the ability to manage to specific service, inventory and cost outcomes, as all processes – forecasting, replenishment and purchasing – are linked.

Next month we examine some of the considerations made when implementing store based forecasting in a retail business.

## Article Five:

### Retail Demand Planning: Delivering the Benefits of Store Level Forecasting



In the previous article on retail demand planning, the advantages of bottom-up forecasting (i.e. forecasting at the lowest possible level, or store level forecasting) versus aggregate level forecasting was compared. The benefits identified included:

- reduced missed sales due to the pre-positioning of stock prior to customer demand,
- seasonal, erratic and promotional demand pattern management,
- consistent service level performance for all items in all stores,
- full Distribution Replenishment Planning, and the integration of replenishment, purchasing and forecasting processes,
- reduced error at each node in the supply chain, and
- the opportunity for superior management control with greater precision and less effort.

They are all worthwhile outcomes. Their attainment however, requires a solid implementation approach that delivers a combination of an appropriate planning system and a well designed business process tailored to the retail environment. This article briefly details some of the key requirements of these two factors in successfully delivering bottom-up demand planning.

It is the characteristics typical to retail businesses that drive many of the system and process requirements. These characteristics were discussed in some detail in the second article of this series 'A Tough Sell' and include:

- high Stock Keeping Unit (SKU) counts often with a long "tail" of products,
- large numbers of stocking locations (i.e. stores and distribution centres),
- stock presentation requirements in stores,
- the impact of "out of stocks" on sales history data,
- frequent and numerous small volume transactions (e.g. customer sales),
- short product life cycles,
- seasonal and / or erratic sales patterns, and
- significant and frequent promotional activity.

As a result of these characteristics, the emphasis on planning system capabilities and business process structure can differ widely to other industries (which often have a longer tradition of using such demand planning approaches, such as manufacturing and distribution).

### System capabilities

On the system requirements side, a store level retail demand planning systems should:

- use a sophisticated automated forecasting system requiring minimum user input to configure and maintain,
- have the capacity to store, transfer and process large data volumes quickly,
- enable significant amounts of 'market intelligence' to be incorporated into plans (e.g. promotional planning, pricing impacts),
- utilise a range of forecast algorithms suited to the wide variety of demand patterns experienced in retail (e.g. seasonal, erratic, slow moving),
- incorporate an intelligent performance reporting framework, and
- support a 'by exception' approach to demand planning management (the larger the product range and number of stocking locations, the more critical this element becomes).

### Process Design

On the process side, the demand planning process should be designed with the business's bottom line front of mind. Process should focus on maximising profitability and achieving the stated customer service promise. When initially developing a demand planning process, it is important to guard against a tendency to concentrate on forecast precision at the expense of other considerations (such as the relative importance of a 'C' class line versus an 'A' class line) that potentially have a greater impact on business outcomes.

Store level retail demand planning processes should:

- sync seamlessly with purchasing and replenishment activity, and have a traceable and auditable impact on these activities and associated inventory policies,
- be cognisant of the '80/20 rule' (or even a '95/5' rule that can be more appropriate for some businesses with 'long tails') and focus activity on the highest value adding activities,
  - forecast exception management techniques should allow planners to target (a) questionable forecasts and (b) focus on high value / critical lines. History exception management needs to address out of stock impacts and promotional activity on sale results,
- consider the suitability of aggregate level forecast management in circumstances of mass promotional activity and, if implemented, proportionately apply aggregate adjustments to the store level forecast

- cover all the key retail demand planning activities, including Out of Stock history adjustments, promotional planning, statistical forecast review, new product introduction, new store forecasting, and forecast accuracy reviews, and
- include a combination of outcome KPIs (measuring the results of activities, such as forecast accuracy and service levels) and process KPIs (measuring the execution of processes, such as the number of forecast adjustments performed). KPIs should relate to stated business objectives.

Listing the requirements for a retail demand planning system and process is one thing; finding a suitably equipped bottom up demand planning system and developing a process tailored to a retailer's needs is a much greater challenge. It is imminently possible however, as a number of retailers in the vanguard of this approach demonstrate, and the potential rewards are significant.

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