Retail Inventory Management
An intricate balancing act

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Retail inventory decisions and their impact on the bottom line

For retailers, inventory management should take a top spot at the executive table, and when it doesn't, you could confidently assume it's a sign of mismanagement.

In recent years, discounters like Aldi and Lidl have been very successful with their clear cost leadership strategy and unique value proposition. At the heart of this strategy is their limited product range of up to 3,000 SKUs, when competing traditional retailers often stock more than 50,000.

The focus on a smaller product range drives efficiency and the benefits are very substantial; large purchase volumes, low purchase costs, lower overall supply chain costs, better stock management and availability, lower inventory and less write-downs caused by shrinkage, aging or obsolescence.
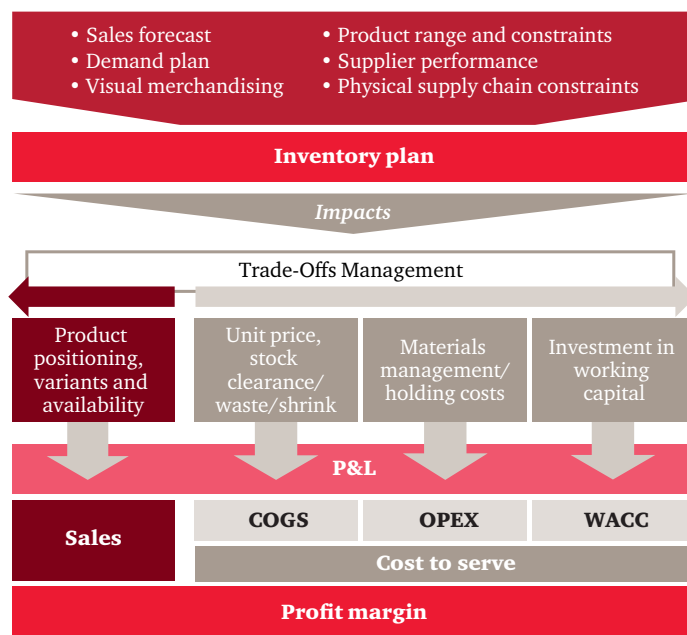
With increasing cost pressures from discounters, traditional retailers have to rethink their strategy, refocus their value proposition and realign their product range accordingly. For full-service retailers, narrowing the product range to exclusively fast movers is not an option but optimising the cost/benefit implications of their product range is key to their fortune.

Expanding a product range typically occurs because commercial teams believe it drives additional revenue; it may do, but sometimes it just cannibalises sales. Most certainly however, it comes at the expense of increased costs driven by COGS, Operating Costs, and Cost of Capital.

The 'Inventory Plan', if done right, contributes significantly to the success of any retail business. Inventory 'shortages' result in lost sales and a drop in customer loyalty, while 'excesses' result in a considerable increase to the 'Cost to Serve'.

To emphasise the importance of the trade-offs between stock availability, range and costs, a recent analysis by PwC's working capital team, found that product range expansion decisions

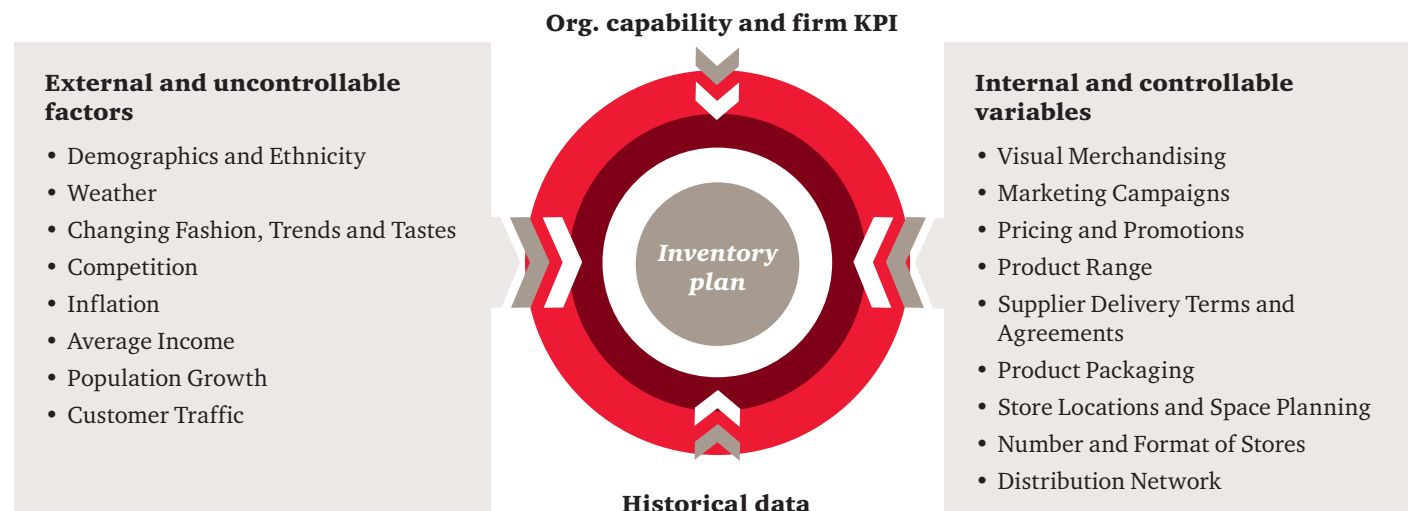*Figure I: Role of inventory management in impacting a Retail business' profitability*

exponentially increased the Days Inventory On-Hand (DIO) leading to longer periods of tied up cash. Furthermore, the resulting stock increase, from range expansion, has generated inventory holding costs between 30 and 45% due to increased stock losses, distribution and store operations costs.

Any incremental margin expected from product proliferation, has to cover or exceed the marginal costs of funding, holding and clearing the excess inventory created.

Complexity in retail inventory planning

The complexity of inventory planning is determined by the level of uncertainty, input variables and big data. As an industry sitting at the downstream of the supply chain and operating almost exclusively in a sell from stock environment, retailers are exposed to a high number of external and internal factors impacting their business:

Figure II: Factors and decisions influencing the quality of the inventory plan

External and uncontrollable factors

- Demographics and Ethnicity
- Weather
- Changing Fashion, Trends and Tastes
- Competition
- Inflation
- Average Income
- Population Growth
- Customer Traffic

Org. capability and firm KPI

Inventory plan

Historical data

Internal and controllable variables

- Visual Merchandising
- Marketing Campaigns
- Pricing and Promotions
- Product Range
- Supplier Delivery Terms and Agreements
- Product Packaging
- Store Locations and Space Planning
- Number and Format of Stores
- Distribution Network

Even in a perfect world where external factors are known, it is always important to consider the driving or limiting nature of the organisation culture, its structure, and the performance incentives driving behaviours.

Table I: Minimum Capability requirement

Organisational	Process	Technical
• Collaborative teams • Open Communication • Management Incentives • Skilled Workforce	• Integrated Business Planning (S&OP) • Supply Chain Visibility • Non-conflicting Performance Indicators	• Mathematical Modelling • Advanced ERP and Planning System • Performance Measurement • Supply Chain Visibility

Due to the large size of multinational retailers, it is therefore very common for functions and categories to operate in silos and ignore the impact of their decisions on the rest of the business.

The reason why inventory gets out of control can be traced back to the sheer complexity of the retail inventory management process. Business managers can be overwhelmed by the constantly changing product ranges, by the tens of thousands of SKUs to plan for and by the thousands of suppliers to manage.

Drivers of in-store inventory

The most basic role of holding inventory is to help supply meet demand. Traditional retailers hold the majority of their inventory in distribution centres or in stores, with the odd exception of in-transit stock especially in general merchandising and clothing.

Inventory in Distribution Centres (DC) has the main objective to:

1. Reduce transportation and warehousing costs
2. Reduce inventory levels through centralisation
3. Increase economies of scale in purchasing
4. Process flexible store orders (e.g.: mixed pallet, case breakdown)
5. Offer stores a lead time shorter than that of suppliers

In-store inventory has the added requirement to be visible and visually appealing to drive sales. The largest portion of inventory is therefore held in stores; which is the heart of the brick and mortar retail industry. After all a shopping experience is only complete when customers find the right product and quantity on the shelf for them to purchase.

Decisions on what and how much to stock in stores are rarely reversible. It is economically unfeasible to blindly push stock to stores then redeploy or return any unsold excess. Overstocking decisions almost always end up in obsolescence and incur large clearance costs. For that reason, it is critical to get store stock decisions right first time. Optimal store stock levels eventually defer from one product category to the next, but the drivers are similar to some extent.

The best way to explain the drivers is through an example.

The following example describes the exercise of identifying inventory requirements for one product, sitting on the shelf of one store.

Food for thought: A retailer with 1,000 stores and 10,000 SKUs will have to periodically repeat the following exercise 10 million times.
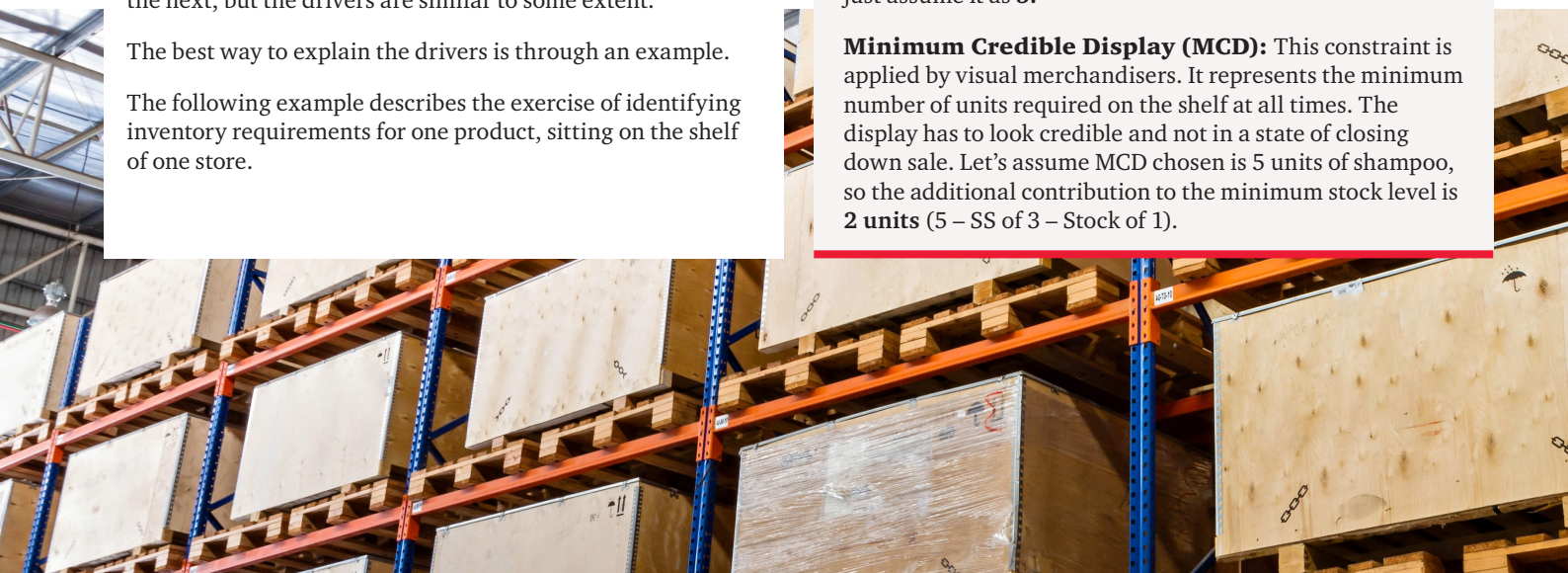
Product: Shampoo bottles
- Case size: **16 units**
- Store replenishment: **Daily**
- Store order lead time: **3 days**
- Average forecast demand: **1 unit/day**
- In-store locations: **2 locations**

Base Stock: Store replenishment is done daily and the daily forecast is one unit then the minimum requirement to meet demand is to have **1 unit** of shampoo at the start of the day.

Safety Stock (SS): Safety stock is a buffer stock needed to deal with uncertainty. Uncertainty is driven by demand forecast errors, variability in supply lead times, variability in quantity, and also driven by inventory inaccuracy, stock losses, waste and shrink. Safety stock calculation combines uncertainty with lead times, replenishment frequency, batch size, and the required service level. Its calculation requires complex maths therefore in this exercise we will just assume it as **3**.

Minimum Credible Display (MCD): This constraint is applied by visual merchandisers. It represents the minimum number of units required on the shelf at all times. The display has to look credible and not in a state of closing down sale. Let's assume MCD chosen is 5 units of shampoo, so the additional contribution to the minimum stock level is **2 units** (5 – SS of 3 – Stock of 1).

Case Size: a case size of 16 (in this simple example) will dictate the cycle stock that fluctuates between 0 and 16 and averages 8, therefore this case size adds **7 additional units to the average stock** (8 – the base stock of 1 unit)
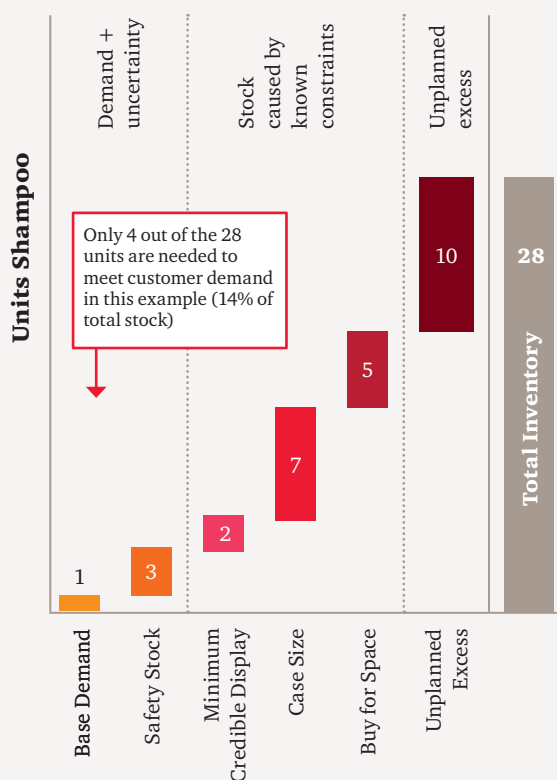
Allocated Space: if visual merchandisers decide to place this product in two different locations in-store, the excess stock this decision creates is equal to at least the minimum credible display of **5 units** (assuming a case can be broken in-store).

Note: These decisions can also be driven by suppliers

If the reported Average Stock Level of the Shampoo product is 28 units then there are **10 units of unplanned excess stock on average** (28-5-7-5-1) this requires further investigation and can be caused by:

- Promotions Stock Overhang
- Damaged/not fit for sale
- Forecast Errors
- Service Override: This is when a store manager overrides the system and orders extra stock.
- Excess space allocated to the product

Figure III: Retail inventory drivers and baseline for in-store stock improvement

> Only 4 out of the 28 units are needed to meet customer demand in this example (14% of total stock)

Units Shampoo

| Base Demand | Safety Stock | Minimum Credible Display | Case Size | Buy for Space | Unplanned Excess | Total Inventory |

Values: 1, 3, 2, 7, 5, 10, 28

Demand + uncertainty | Stock caused by known constraints | Unplanned excess

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Understanding the inventory breakdown by driver helps companies make better decisions to optimise their stock. Any change to the drivers requires the involvement of a large number of stakeholders:

Table II: Spread of Stakeholders by inventory driver

		Sales and marketing	Buyers	Category management	Distribution/supply chain	Suppliers development	Store operations	Planners	IT	Merchandising	Property	Finance
Base	Demand forecast	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
	Store replenishment freq.			✓	✓		✓	✓	✓			✓
Safety stock	Supplier lead time		✓		✓	✓		✓	✓			✓
	Store order batch size		✓		✓		✓	✓	✓			✓
	Service levels	✓	✓		✓			✓	✓			✓
	Supplier performance		✓		✓	✓		✓	✓			✓
	Store replenishment freq.				✓	✓	✓	✓	✓			✓
	Forecast accuracy	✓	✓	✓	✓	✓	✓	✓				
Credible display	Shelf size		✓	✓			✓	✓		✓	✓	✓
	Product type	✓	✓	✓			✓	✓		✓		✓
	Product size	✓	✓	✓			✓	✓		✓		✓
	Packaging	✓	✓	✓	✓	✓	✓	✓				✓
Case Size	Unit per case		✓		✓	✓	✓	✓	✓			✓
	Packaging		✓		✓	✓	✓	✓	✓			✓
	Single pick		✓		✓		✓	✓	✓			✓
Space	Category sales targets	✓	✓	✓		✓						✓
	Space available to fill					✓					✓	✓
	Usage of freed-up space	✓	✓	✓			✓	✓		✓	✓	✓

Retail inventory optimisation is a highly integrated process. Decisions impacting inventory are strategic, functional as well as operational. It is not uncommon to see inventory trade-offs skewed in favour of the strongest stakeholder. Therefore, only a robust senior sponsorship and governance can help moderate and resolve conflicting objectives while solely focusing on value creation.

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