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How to ace your inventory management

Your guide to moving from inventory management to inventory optimisation

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Traditional inventory management practices

Any organisation carrying stock will face various inventory management challenges. Whether trying to improve inventory turnover, reduce excess stock or prevent stock-outs, inventory management teams are never short of obstacles to overcome!

What often gets overlooked is that most issues are caused by an inability to optimise inventory levels, e.g. balance the need to fulfil orders efficiently while reducing inventory investment.

If you can crack this conundrum, many other inventory KPIs will look after themselves.

Unfortunately, many organisations still use traditional inventory management practices and one-dimensional calculations. These are too basic and linear to provide a solution.

They're also no longer suitable for dealing with the issues brought about by today's volatile global marketplace and disrupted supply chains.

In this eGuide, we will expose the flaws of typical inventory management processes and introduce some new and extremely effective ways to optimise your inventory – using inventory optimisation techniques.

The flaws of using traditional inventory management practices

Traditional inventory management calculations cannot account for supply and demand volatility.

Political, economic, social and environmental factors are increasingly impacting global market demand and supply chains. Consequently, many businesses struggle to fulfil customer demand, in terms of stock availability and delivery expectations, without carrying excess items to protect against increased supply risk, longer lead times and fluctuating sales.

Standard inventory management practices, often used by stock planning teams, enterprise resource planning (ERP) or warehouse management systems (WMS), fail to address this problem. This is because they use linear, rules-based programming to determine how much stock to order and when to order it, and like it or not, today's global markets do not follow linear patterns.

Let's take a closer look at some examples of traditional inventory management calculations.

Forecasting demand with moving averages

For starters, it's very common for businesses (and ERPs and WMS) to use basic, moving-average formulas to forecast demand:

$$\text{Future average demand per month} = \frac{\text{Average demand over x months}}{\text{x months}}$$

Using average historical consumption to calculate upcoming demand is only effective if your item has flat, consistent demand, e.g. you sell or use the same amount of the item during every order cycle. In reality, the demand for most items will fluctuate and be impacted by seasonality or market trends. You will suffer from stockouts or excess inventory unless you consider such factors.

Common reorder point formula

The same is true when calculating reorder points. As shown below, a typical reorder point formula assumes lead times remain consistent.

Reorder point = (Average consumption x lead time) + safety stock

However, as many businesses have experienced in recent years, lead times can be severely impacted by anything from a simple national holiday to bad weather conditions, customs issues, and even global pandemics.

Simple, linear calculations cannot consider these factors, so you'll end up with inaccurate results unless you regularly refresh and update your lead time data.

Safety stock calculations

You may think that safety stock will help ensure sufficient inventory levels to cover unforeseen circumstances. For example, if a customer places a surprise large order or a delivery is delayed.

Many businesses, however, still rely on over-simplistic safety stock calculations that fail to consider demand and lead time variance.

Often, safety stock is calculated by adding a specific number of safety stock days to the reorder point, e.g. an extra week's worth of stock to allow for issues. Calculating safety stock as a percentage of lead time demand is also possible, e.g. adding an extra 20% of stock. It would be more prudent to use an average and max safety stock formula, which accounts for when lead times rise and sales max out.

Safety stock = (Maximum sales + maximum lead) - (Average sales + average lead time)

In reality, these options will result in businesses unnecessarily inflating their safety stock levels or risking stockouts.

In summary, traditional inventory management processes aren't sufficient for today's volatile trading environments. Inventory planning teams need the ability to account for supply and demand variance, and the best way to do this is to use probabilistic formulas that measure risk.

A probabilistic approach accepts uncertainty when predicting future events and accommodates this by covering for a percentage of all possible inventory requirements.

Focusing on stock days will not optimise inventory levels

The output value of many common inventory management calculations is measured in ‘stock days’.

For example, a simple safety stock formula provides a specific number of stock days to cover demand and lead time fluctuations. Stock days is also a well-known inventory KPI that measures the average number of days that stock is held before being used or sold.

$$\text{Safety days} = \frac{\text{Cost of average inventory}}{\text{Cost of goods sold}} \times 365$$

While calculations that use stock days are a simple way to understand when to reorder stock, or how quickly stock is turned, many businesses also mistakenly try to use them to optimise their inventory.

As we mentioned in our introduction, inventory management teams often want to balance the cost of buying and holding stock to satisfy demand. They also want to know how adjusting one will affect the other.

Unfortunately, simple linear inventory management formulas can’t do this as they only provide an output in ‘stock days’, which are disconnected from the customer experience. For example, if you decide to reduce your number of stock days to lower carrying costs, you won’t know how this will affect stock availability and customer service.

In a world where customer satisfaction is at the heart of many business’s success, inventory management metrics need to be able to relate back to this key KPI. This is why inventory management teams are increasingly ditching linear stock days calculations for probabilistic alternatives.

Introducing inventory optimisation

Inventory optimisation is a relatively new concept and can often be confused with basic inventory management processes.

Inventory management

Inventory management is the business process responsible for ordering, managing, storing and moving inventory. As an element of supply chain management, inventory management supervises the flow of goods from manufacturers to warehouses and onto the relevant sales channels.

Inventory optimisation

Inventory optimisation is the art of balancing high service levels (stock availability) with the lowest possible inventory investment. It allows businesses to fulfil demand, while reducing inventory costs and minimising the risk of excess stock. This uses advanced formulas with multiple inputs to forecast demand and manage supply variables, while adjusting stock rules and inventory parameters dynamically.

Inventory optimisation employs probabilistic, statistical formulas that consider multiple factors impacting demand and supply variability – down to SKU level.

Moving from linear, easy-to-calculate inventory management processes focusing on stock days to more advanced inventory optimisation formulas requires good statistical mathematics knowledge, as many probabilistic formulas are involved. This is why more and more businesses are connecting inventory optimisation software to their ERPs to do their calculations.

Inventory optimisation plug-in tools can easily be integrated with these systems to offer a more comprehensive solution. Even without the software, basic inventory optimisation principles can still be practised.

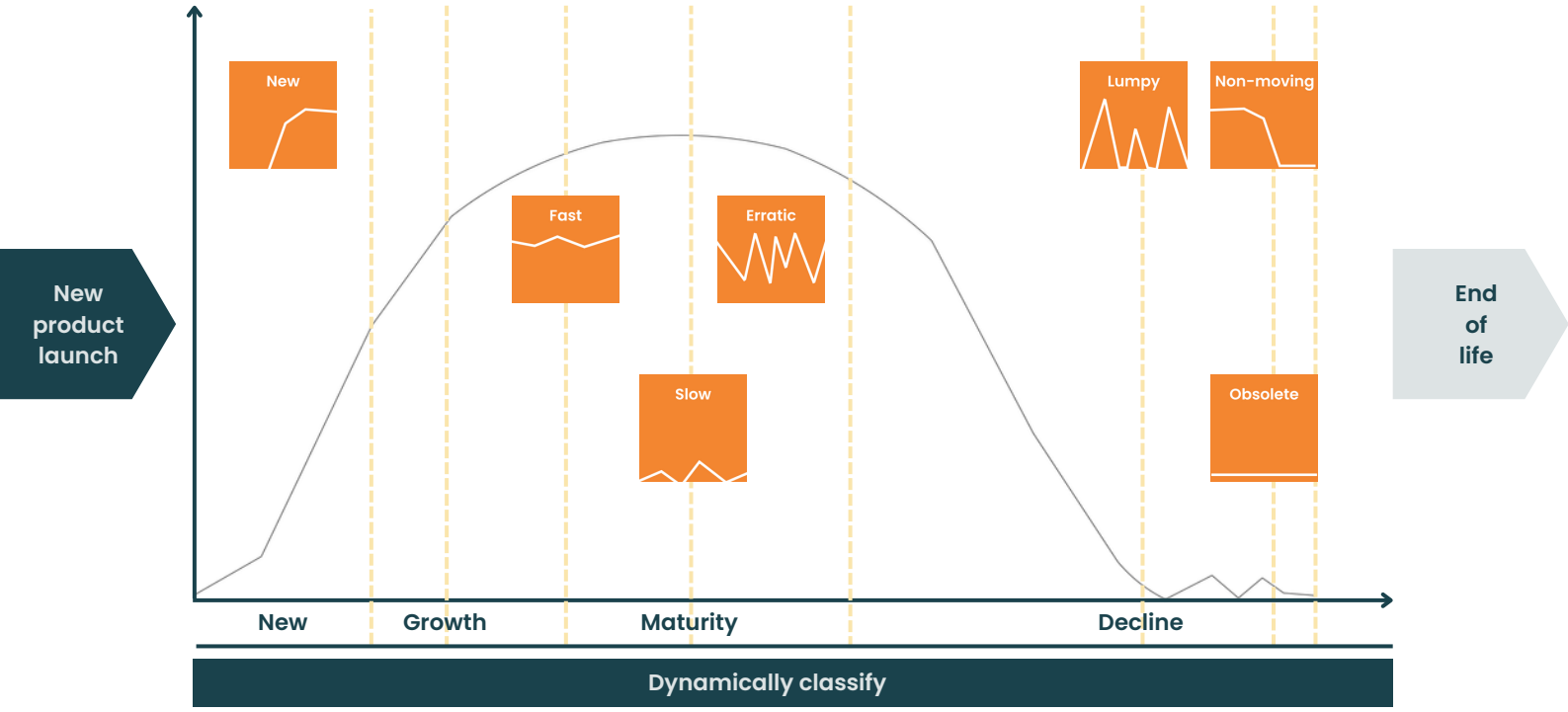
Examples of inventory optimisation in practice

Demand forecasting

As we've already established, any inventory manager using a basic 30-day moving average formula will find it almost impossible to generate accurate demand forecasts.

This is because these calculations are only suitable for inventory items with stable demand, where the previous 30 days' consumption is a good indicator of the future forecast period. However, in reality, very few items have stable demand.

Instead, items will experience different demand patterns based on their position in their product lifecycle. For example, when a product is first introduced to the market, its demand will likely follow a positive trend as sales increase until it hits maturity, as sales stabilise. From there, demand might get more erratic and lumpier before moving into a negative trend and becoming a dying and obsolete product.



Therefore, forecasting models must treat items differently depending on their demand type. This is because each demand type has a different deviation from its mean demand, e.g. ‘lumpy demand’ rises and falls with lots of deviation from the mean, whereas ‘fast demand’ has a lot less deviation from the mean.

Demand types, therefore, dictate the statistical algorithm for forecasting demand. For example, a different algorithm should be used for ‘lumpy demand’ products (moving average) to ‘fast demand’ products (double exponential smoothing).

By analysing historical sales and demand data for each item in your warehouse, you can build up a picture of their current demand type, group them accordingly and then apply the right forecasting model.

With base demand calculated, inventory optimisation techniques then seek to identify items that are affected by:

Seasonality

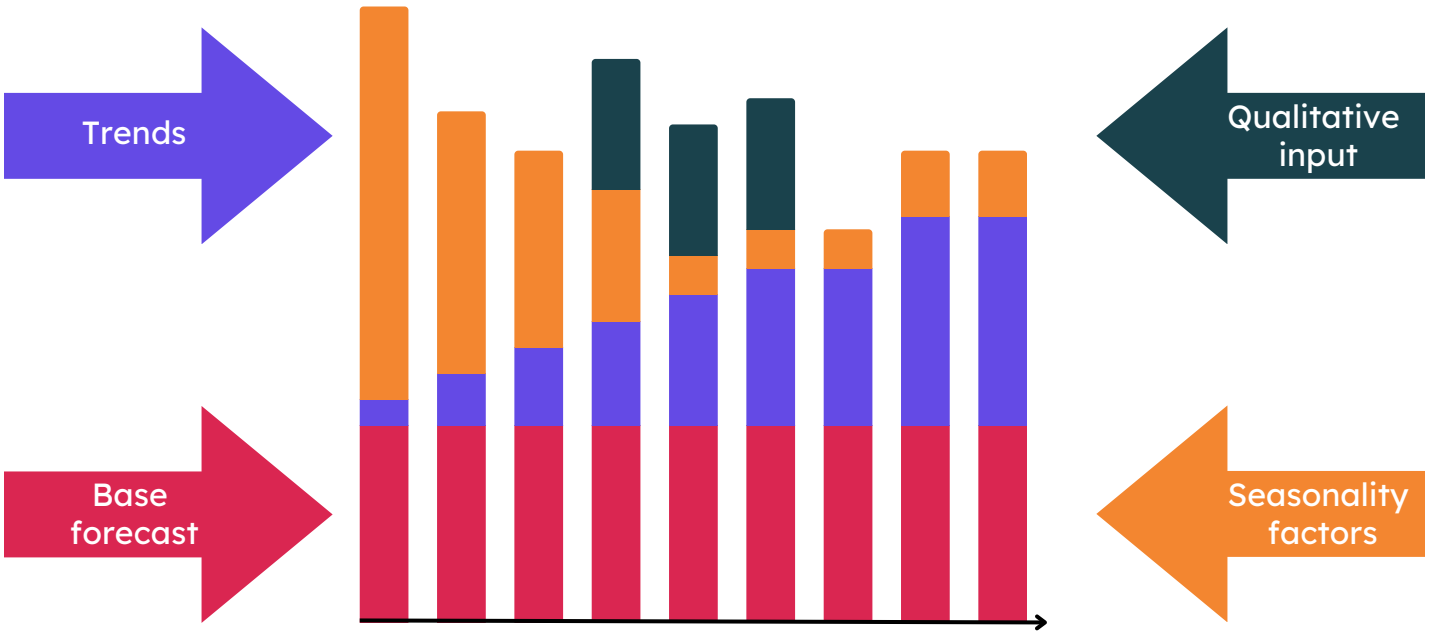
Reviewing historical sales data allows the identification of seasonal patterns to adjust forecasts accordingly. This helps prevent shortages during peak seasons and expensive surpluses as demand tails off.

Trends

The demand for inventory items will ebb and flow as fashions change, new technologies replace old and social, economic and legal factors influence the market.

Promotions

Special offers, discounts and long-term price drops all impact the overall demand for products.



Inventory classification and stocking policies

Many businesses make the mistake of carrying excessive amounts of inventory to meet fulfilment targets. In reality, this ties-up large amounts of working capital and warehouse space and increases the risk of excess and obsolete stock.

In contrast, inventory optimisation uses inventory classification and stocking policies to achieve high levels of stock availability with the lowest possible inventory investment.

The simplest way to do this is to using an ABC classification model to segment stock items based on their value to the business.

You can then set different stocking policies to prioritise the availability of category A items (that generate the most money) over B and then C items.

However, ABC analysis is a manual process, meaning inventory segments become outdated quickly, making it unsuitable to help you keep up with today's dynamic marketplaces.

Inventory optimisation software offers a much more advanced solution. It does this by analysing stock at SKU level and grouping items based on several criteria.

Demand forecasting

Firstly, based on how often an item is picked. For example, it makes sense to increase the stock of frequently picked items rather than those that sit on the shelves.

Inventory planning

Secondly, based on demand volatility. For example, it's less risky to stock products with consistently high demand over those with fluctuating demand.

Supplier management

Finally, based on the value a product brings to the business. For example, sales revenue, profitability, sales volume, or annual consumption value.

With every SKU categorised into an inventory matrix, you can set strategic stocking policies to help avoid carrying excess stock while ensuring demand can be met.

Service levels are the expected probabilities of satisfying all possible inventory requirements within a particular period. For example, setting a service level target of 99% means your safety stock levels will cover 99% of all probable requests. In other words, you can give your customers what they want, when they want it, 99% of the time.

The aim is to achieve the highest service levels for products critical to the business with the most regular demand and are relatively less expensive to stock. Service levels can reduce as demand becomes more volatile and stock is more costly to sell.

Replenishment

It's common for many inventory teams to use rules-based, linear methods to calculate their replenishment needs. For example, most will reorder when they hit a fixed date or stock drops to a specified level. The amount they reorder is usually either fixed (often based on a set number of stock days) or variable to meet a minimum or maximum stock capacity.

This 'one-size-fits-all' approach will often fail, as not all inventory items are the same. Consequently, managers will get stock imbalances that result in excessive inventory costs, impeded cash flow and poor or inconsistent service levels simultaneously.

In contrast, replenishment calculations are much more dynamic when using an inventory optimisation approach.

Reordering and safety stock parameters are set by taking a wide range of demand and supply variables into consideration, including:

Target service levels

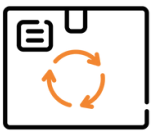
So you can meet your fulfilment targets, without holding excess stock.

Demand forecasts and demand types

To account for different demand types at different stages in a product's life cycle and seasonality, trends etc.

Supplier lead times

So you can ensure you have enough safety stock to cover any variability in lead times. For example, the Chinese New Year, when many Chinese manufacturers shut down production, often causes big supply disruptions for many Western distributors who fail to account for it in their replenishment planning.



Cost-effective order quantities

Allowing you to weigh up whether it's cheaper to buy in bulk with higher carrying and opportunity costs or aim for smaller regular reorders.

Current stock levels, stock on order and in transit

To get a complete overview of your stock levels, you also need to know what's on the way from your suppliers. This may seem obvious, but this information isn't easily retrievable for most systems.

Inventory optimisation is the future of inventory management

Inventory management is about much more than tracking goods along the supply chain.

Businesses that want to be one step ahead should look at inventory optimisation techniques to accurately meet demand with the lowest possible levels of investment. At the heart of this process are supply and demand variables that need to be analysed and accounted for in all inventory management calculations, including forecasting, setting stocking policies or replenishment.

It's fair to say that attempting to introduce inventory optimisation calculations that use probabilistic formulas without the right tools could prove complex and time-consuming. Unfortunately, most ERP systems lack the necessary dynamic capabilities.

One answer is to invest in inventory optimisation software. You can use a simple ERP plug-in to move away from traditional inventory management methods and towards effective, automated inventory optimisation. With efficiency improvements from automation, reduced stock levels, better product availability and cashflow, and enhanced customer service, companies will quickly see a return on their investment.

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Powerful inventory optimisation made simple

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