

How to improve demand forecasting accuracy

Accurate demand forecasting ensures you have the right products in the right place at the right time to meet your demand.



Contents

Current demand forecasting challenges	3
Importance of demand forecasting	4
Demand forecasting techniques	6
Demand types	7
Demand types and the product lifecycle	9
Factors that affect demand	10
Demand fliers	13
Measuring demand forecasting accuracy	14
Summary	16

Current demand forecasting challenges

Demand forecasting is a critical aspect of inventory management and brings huge rewards when done correctly.

Retailers, distributors and manufacturers are continually looking for ways to improve their inventory management processes to optimise efficiency.

Inventory forecasting has massive implications across your business, from sales to logistics to finance.

As an inventory planner, the art of demand forecasting ensures you have the right products in stock at the right time to meet customer demand.

However, if you over-forecast you'll end up with too much capital tied up in excess or obsolete stock. While under-

forecasting often leads to stock out situations and lost sales.

In this eGuide, we'll review specific demand forecasting techniques and how they can help you improve your forecasting practices to make them as accurate as possible.

Inventory planners who master simple demand forecasting techniques drastically improve their chances of consistently maintaining the right stock levels in their warehouses, making their company more competitive in the marketplace and driving higher profits.

Importance of demand forecasting

Demand forecasting is the process of predicting customer demand for an item over a defined period.

Historical data trends and market knowledge of how demand can fluctuate are often used to forecast demand. Accurate inventory demand forecasting enables a company to get optimal inventory control and hold the right amount of stock without over or under-stocking.

01

Improve customer satisfaction

Customers have zero tolerance for stock outs. Ensuring product availability keeps fulfilment rates high and positive reviews flowing.

02

Optimise inventory levels

Setting safety stock levels based on accurate forecasts will prevent stock outs without holding excess stock.

03

Prevent lost revenue

Stock outs lead to lost sales, not only for that product but also for companion items or even future orders.

04

Optimise purchase orders

Understanding demand improves order efficiency in terms of optimising order quantities.

05

Manager supplier lead times

By giving suppliers a forecast of your annual or upcoming inventory needs, they can plan to meet your delivery deadlines.

Demand forecasting techniques

The most common inventory demand planning methods combine **quantitative** and **qualitative** forecasting models.

Quantitative forecasting is statistically driven. You'll combine historical demand or sales data and mathematical formulas to determine future performance.

Qualitative forecasting is far more subjective and relies on educated deductions rather than number crunching. Demand is forecasted based on expert knowledge and experience of how the market works. This could come from one key person or internal and external opinions and insights into the business.

Utilising quantitative and qualitative methods creates a hybrid forecasting model that considers historical data and market insights.



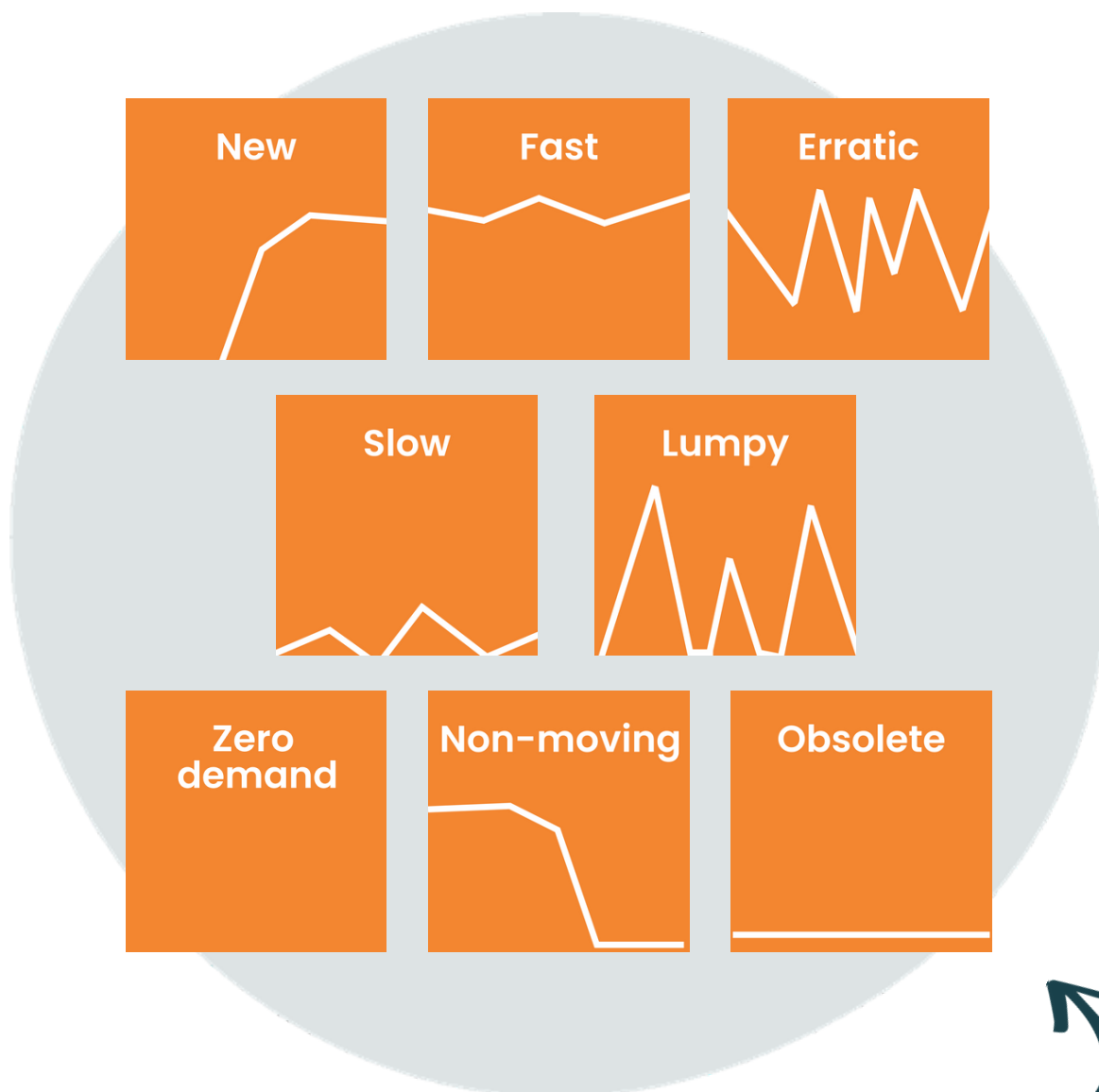
Using historical demand information as a starting point allows you to add empirical knowledge to refine your forecast further.

For example, a curtain manufacturer may use quantitative historical sales data to forecast the base demand for curtains in the coming year but then use qualitative information, such as data about fashion trends and competitors, to adjust the forecast accordingly.

Demand types

If you analyse the historical sales data of every product in your warehouse, you'll find that the demand for different items varies considerably. Some products will have consistently high demand over time; for others, there could be sporadic or low demand.

At EazyStock, we categorise all items into eight different demand types:



8 different demand types

You can see that with each demand type, the demand fluctuates differently, and the standard deviation (variance from the mean demand) is greater or smaller in every case.

An item's demand type is important as it should be used to determine the type of calculation (or algorithm) you use for forecasting. For example, using different algorithms to calculate the demand for a product with an erratic demand type versus one with slow demand makes statistical sense.

Demand types not only drive the techniques needed for accurate forecasting but can also help determine accurate safety stock and service level calculations.

How to use demand types

If you use enterprise resource planning (ERP) software or a basic inventory management tool for your forecasting, take some time to find out how it calculates your products' forecasts and whether it only uses one algorithm for the job.

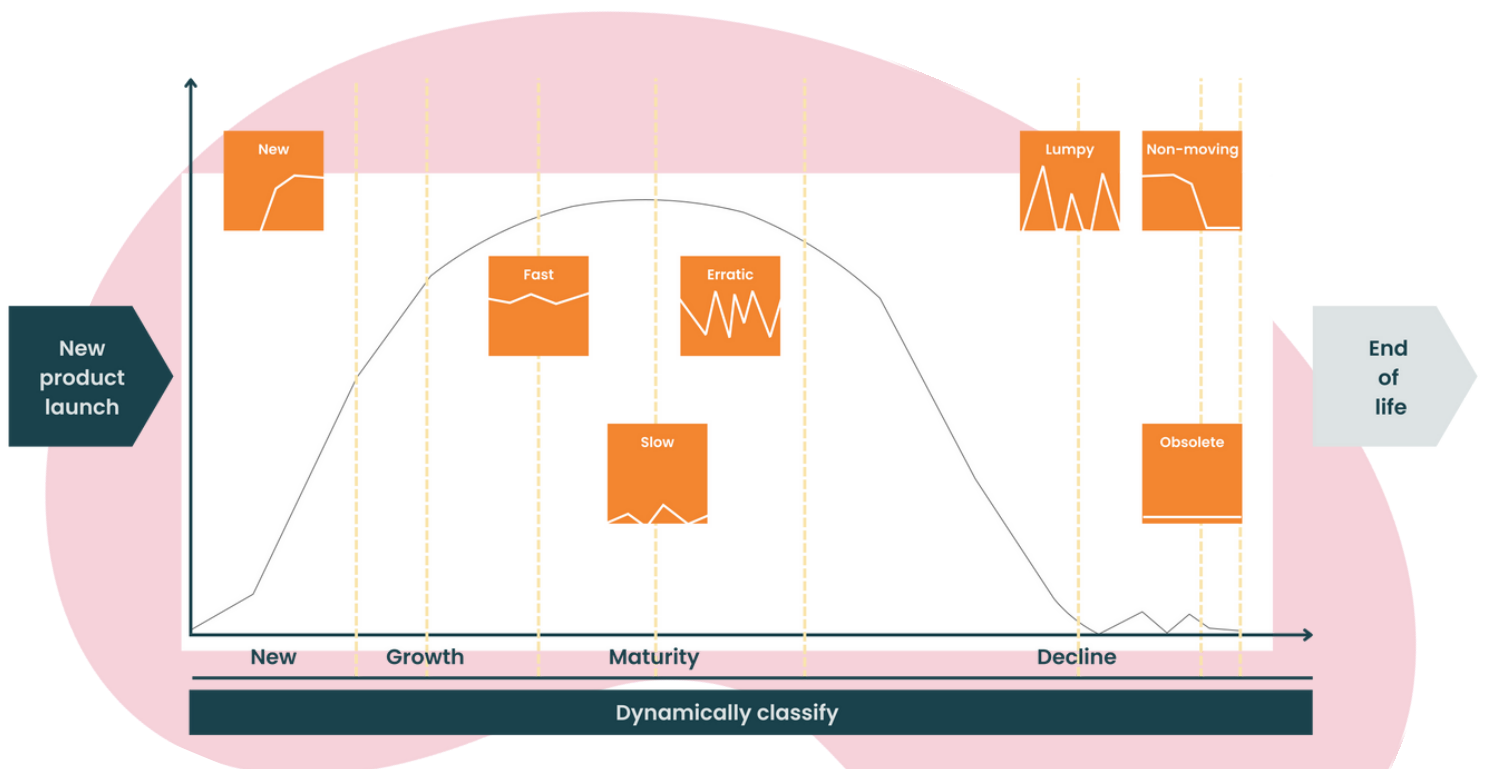
A more advanced inventory optimisation tool like EazyStock uses forecasting algorithms for different probability distributions based on a product's demand type. This offers a much more accurate forecast than an ERP or manual process with a spreadsheet.

Demand types and the product lifecycle

Every product moves through the product lifecycle, from being introduced to the market to maturity and decline. During this cycle, demand will traverse the different demand types we have already discussed.

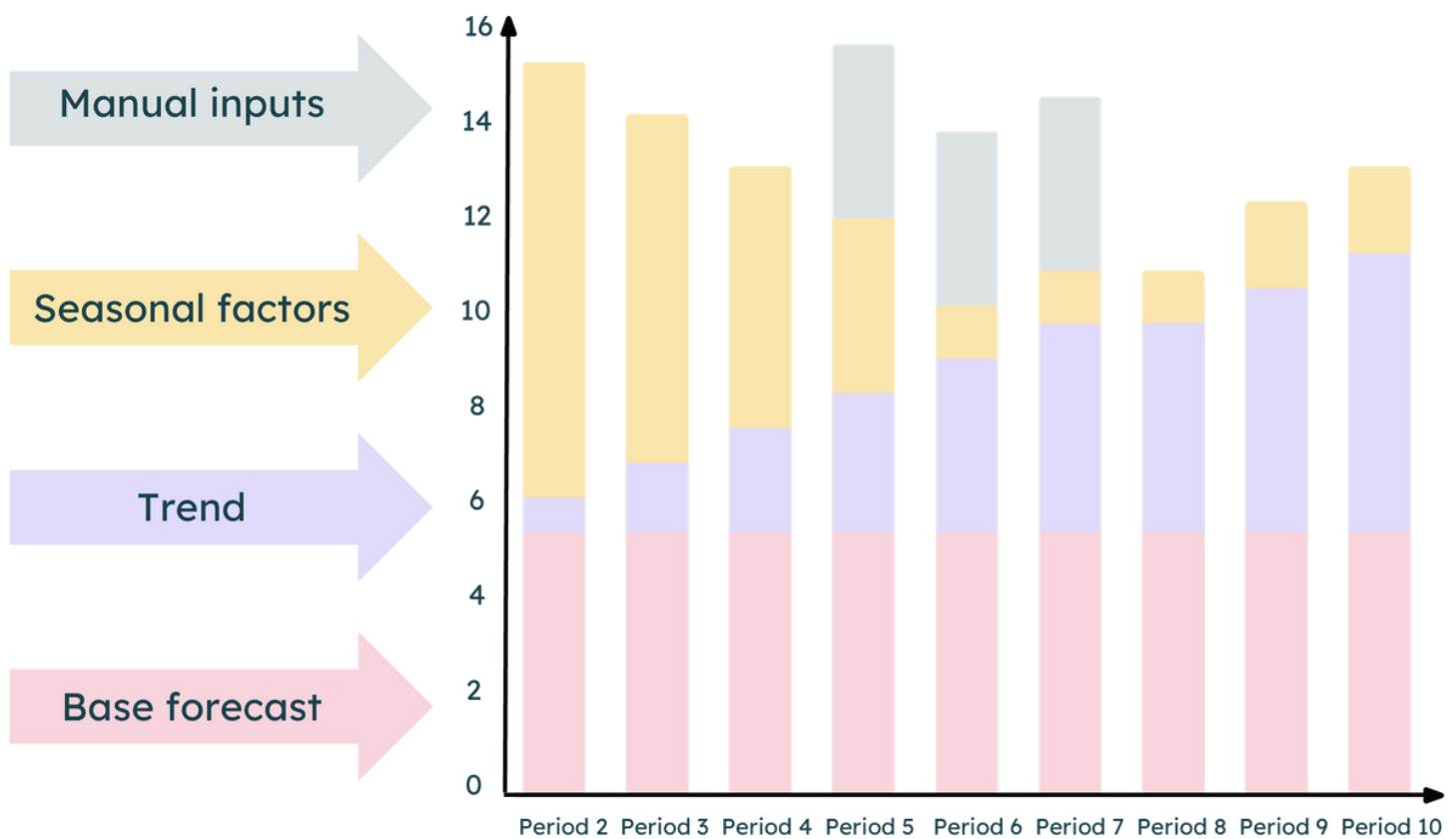
As a product moves through the demand stages, you should use different forecasting algorithms to best exploit the historical data and degree of market knowledge available.

Understanding and following your products' lifecycles will help you better forecast their demand. It will ensure you don't miss sales opportunities and prevent large quantities of obsolete stock in your warehouse.



Factors that affect demand

The chart below shows several important factors that can affect your demand forecast.

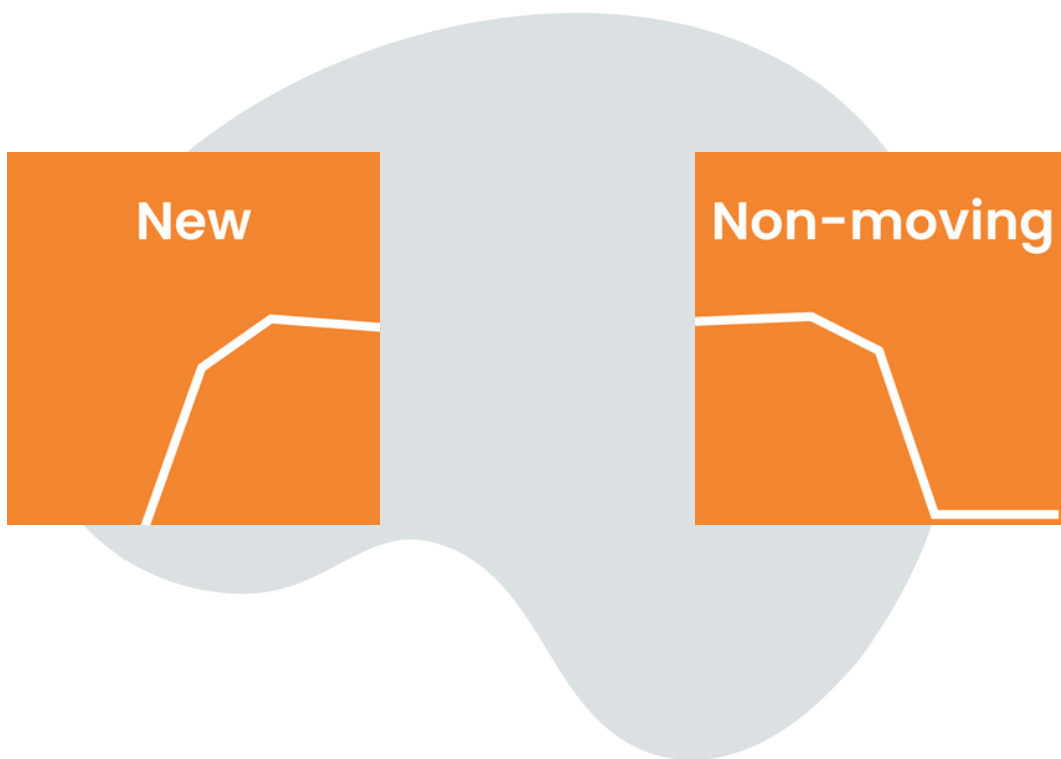


It's best practice to keep all variable factors separated from your base demand calculations to keep the data clean and easy for future forecasting.

1. Demand trends

The demand for your products will ebb and flow as fashions change, new technologies replace old, and social, economic and legal factors influence demand.

Products will also follow demand trends as they move through the product cycle. For example, in the growth phase, the trend in demand will be upward, while in the decline phase, it will be negative.



2. Qualitative inputs

As previously mentioned, while historical data provides an excellent basis for demand forecasting, you may need to consider more qualitative factors. These include future events and external market factors, such as sales promotions and competitor activity. Ensure you input any available sales and marketing insights into your forecasts to make them as accurate as possible.

3. Seasonal demand

Almost every business can expect to experience seasonal fluctuations in their demand. Religious festivals such as Christmas or Ramadan and seasonal weather patterns, like snow in winter, can all lead to seasonal variances.

It's important to understand how seasonal factors affect your customers' purchasing habits and take this into account when forecasting so you can:

- Ensure you have sufficient stock levels available to take advantage of increases in product demand at peak times of the year and ensure products are never out-of-stock.
- Prevent having excess stock at the end of a season with the dilemma of selling it off at a discounted rate or taking on the burden of inflated carrying costs until demand picks up again.

Remember that seasonality only refers to the portion of demand fluctuation accounted for by a reoccurring pattern. Therefore, you only need to identify demand patterns that repeat systematically over time.

If seasonality is relevant to an item, you should adjust the demand accordingly before using it in a forecast calculation to ensure the integrity and accuracy of the forecasts.



Demand fliers

The accuracy of a demand forecast can be seriously affected by ‘fliers’ (or ‘outliers’) in your data. A flier is a data point considered to be overly high or low compared to others in a data series.

Whereas seasonal fluctuations are tracked as patterns over time, outliers are one-time events and less predictable. For example, sales transactions that result from a flash clearance sale do not represent typical demand for a given period.

Fliers can be caused by known events like large, one-time orders or sales promotions. Or they can be caused by events you have no knowledge of, like a customer going out of business, natural disasters, etc.

There are different ways to detect fliers, but it is important to flag and consider them as they can affect and skew the accuracy of your demand forecasting data.

Sometimes it’s necessary to discard them from your overall forecasting calculations. However, this isn’t always the case, and on closer inspection some fliers may turn out to be a genuine demand pattern.

If you have an ERP or Warehouse Management System (WMS), investigate whether this functionality is available. With a proper system, you can track and flag unusually high or low inventory demand outliers to remove the risk of negatively impacting your demand forecasting accuracy.

Measuring demand forecasting accuracy

Measuring the accuracy of a demand forecast allows you to account for potential errors in your data and refine your purchasing processes accordingly.

One way to check the quality of your demand forecast is to calculate its forecast error. Forecast error is the deviation of the actual demand from the forecasted demand.

These calculations provide a quantitative estimate of the expected quality of your forecast. Methods to calculate forecast error include the Mean Absolute Percent Error (MAPE) and Mean Absolute Deviation (MAD) calculations.



The benefits of **calculating forecast error**

Estimating the level of error in your demand forecast allows you to:



Factor in risk

Factor in a level of risk so you can make the necessary adjustments, such as increasing safety stock levels and adjusting reorder points to cover uncertain periods of demand.

Prioritise products

Prioritise monitoring products with a high forecast error and adjust stock levels accordingly.

Improve your forecasts

Check out products that have consistently high error rates. This indicates that your demand forecasting technique need reviewing and improving.

Investigate whether your ERP or WMS has the functionality to calculate demand forecasting errors automatically. Every system will have a different level of complexity, so be sure to understand yours and account for its limitations.

Summary

Accurate demand forecasting is critical to most businesses that hold and sell stock – whether you're a manufacturer, wholesaler, or retailer.

With the right products in stock to meet demand, you can please your customers, maximise sales during peak seasons, prevent stock outs and avoid carrying excess inventory.

However, demand forecasting is much more complex than simply calculating a three-month running average and using this to predict upcoming demand. As this eGuide has shown, you can use many techniques and methodologies to improve your forecast and enhance its accuracy.

Additionally, inventory forecasting using basic ERP functionality, inventory management tools or manual spreadsheets is too simplistic and can lead to inaccurate forecasts and stocking issues.

Consider using robust inventory optimisation software like EazyStock to boost your inventory forecasting accuracy.

EazyStock helps SMEs automate their demand forecasting and inventory planning, ensuring the right products are in the right places at the right time for delivery while minimising inventory investment.



eazystock

**Get started with
automated inventory
optimisation**

Book a demo