

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	15
Summary	17

Current demand forecasting challenges

Demand forecasting is a critical aspect of inventory management and results in huge rewards when carried out correctly.

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

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. And under-forecasting often leads to stock-out situations and lost sales.

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

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 levels of stock in their warehouses, making their company much 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 of time.

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

01

Improve customer satisfaction

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

02

Optimize 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 for companion items or even future orders too.

04

Optimize purchase orders

Understanding demand improves order efficiency in terms of optimizing 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. With quantitative forecasting you'll use historical demand data, or sales data, and combine it with mathematical formula 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 from opinions and insights both internally and externally to the business.

By utilizing quantitative and qualitative methods, you can create a hybrid forecasting model that considers both historical data and market insights.



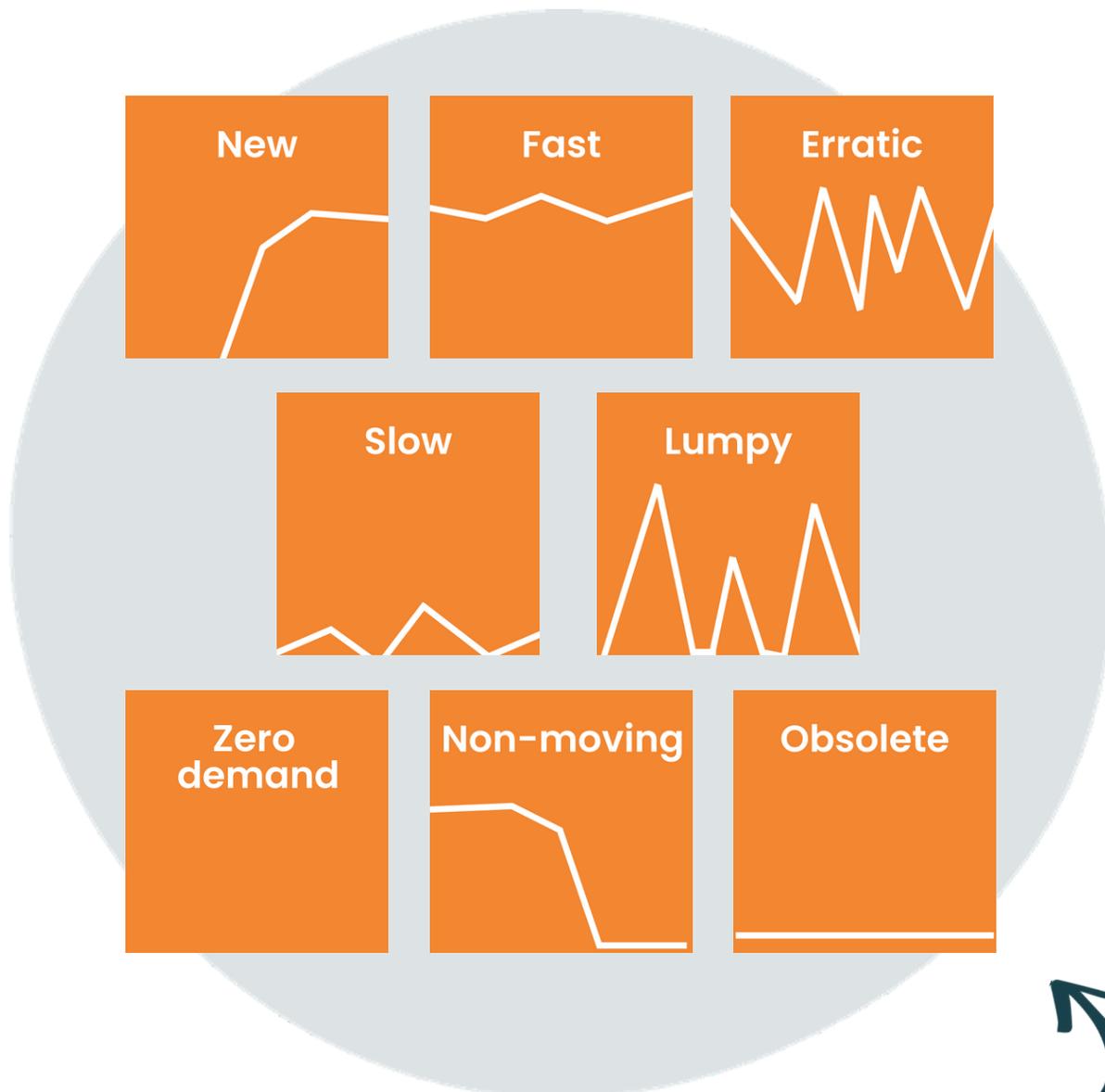
Using historical demand information as a starting point you can then add empirical knowledge to further refine your forecast.

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 around fashion trends and competitors, to adjust the forecast accordingly.

Demand types

If you analyzed the historical sales data of every product in your warehouse, you'd 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 categorize 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, it makes statistical sense to use different algorithms to calculate the demand of a product with an erratic demand type versus one with slow demand.

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 an 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 only one algorithm is used for the job.

A more advanced inventory optimization tool like EazyStock uses different probability distributions in its forecasting algorithms, based on a product's demand type, to calculate a forecast. This offers a much more accurate forecast than using an ERP or manual process with a spreadsheet.

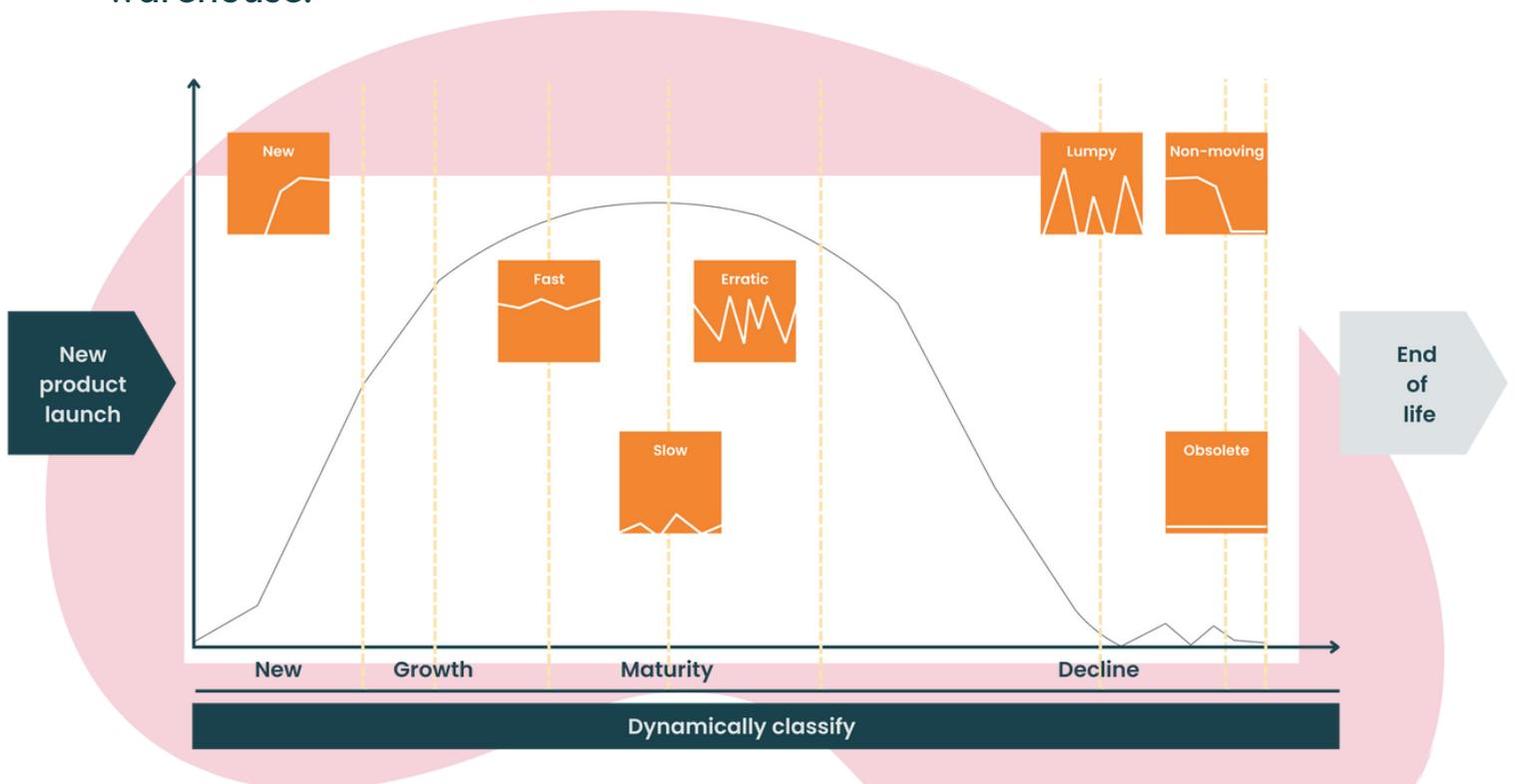


Demand types and the product lifecycle

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

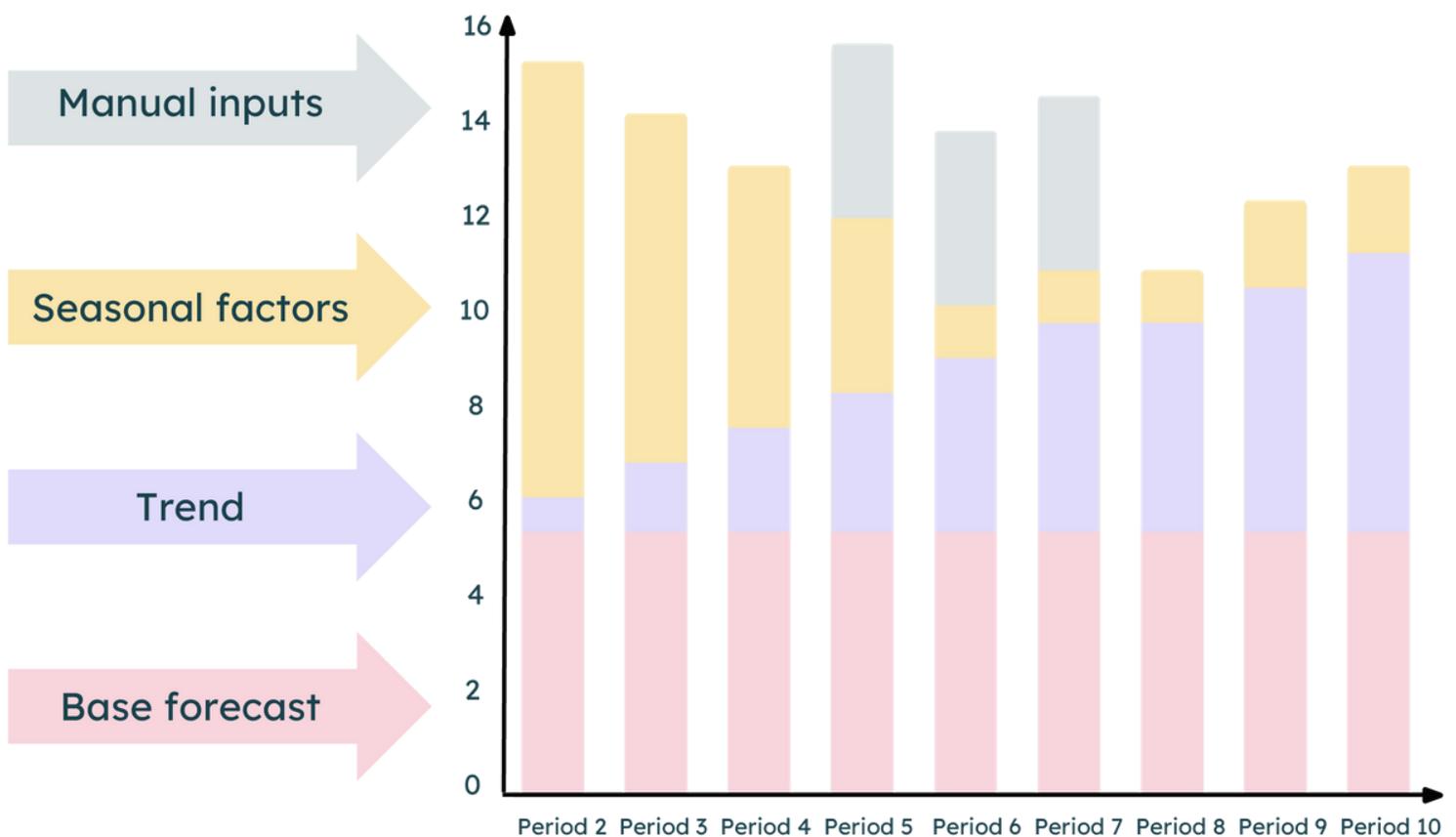
As a product moves through the demand stages, you should use different forecasting algorithms to best exploit the historical data and degree of market knowledge available.

Understanding and following the lifecycle of your products will help you to 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 a number of important factors that can affect your demand forecast.

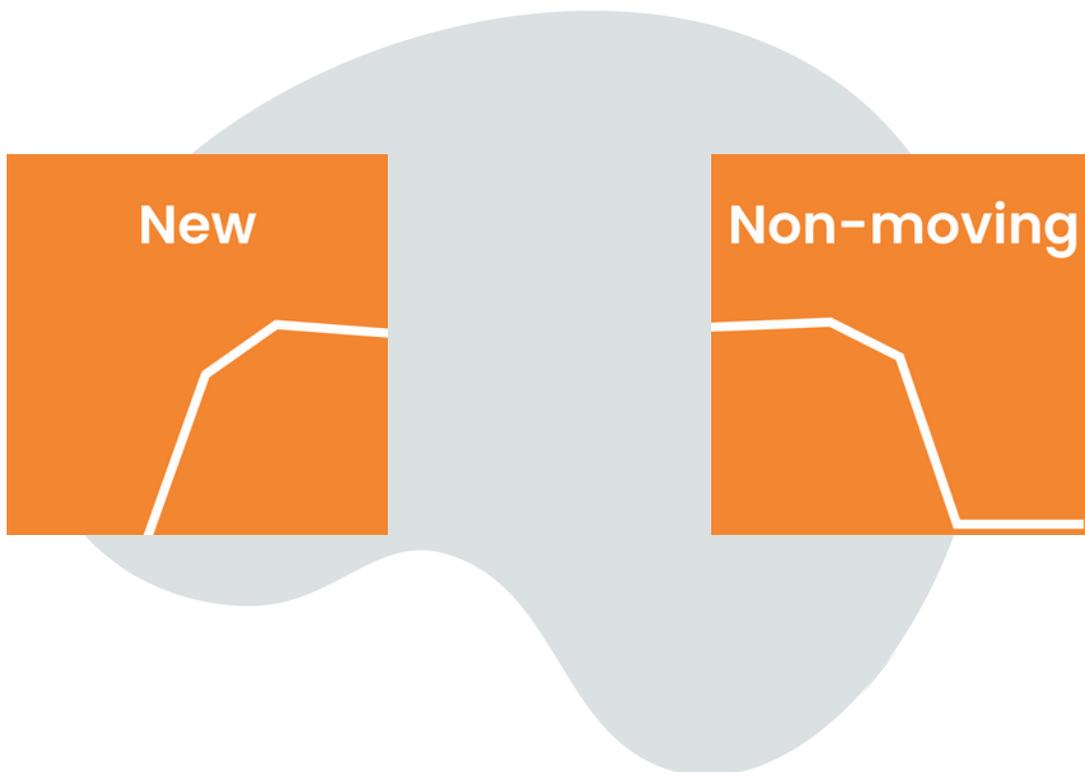


It's best practice to keep all variable factors separated from your base demand calculations in order to keep the data clean and easy to use for forecasting going forward.

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 upwards, while in the decline phase it will be negative.



2. Qualitative inputs

As previously mentioned, while historical data provides a great basis for demand forecasting, sometimes you'll also need to consider more qualitative factors. These include future events and external market factors, such as sales promotions and competitor activity. Make sure you input any sales and marketing insights you have 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 levels of stock 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 that is 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 that you have no knowledge of like a customer going out of business, natural disasters, etc.

There are different ways to detect fliers, but the important thing is that you 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.

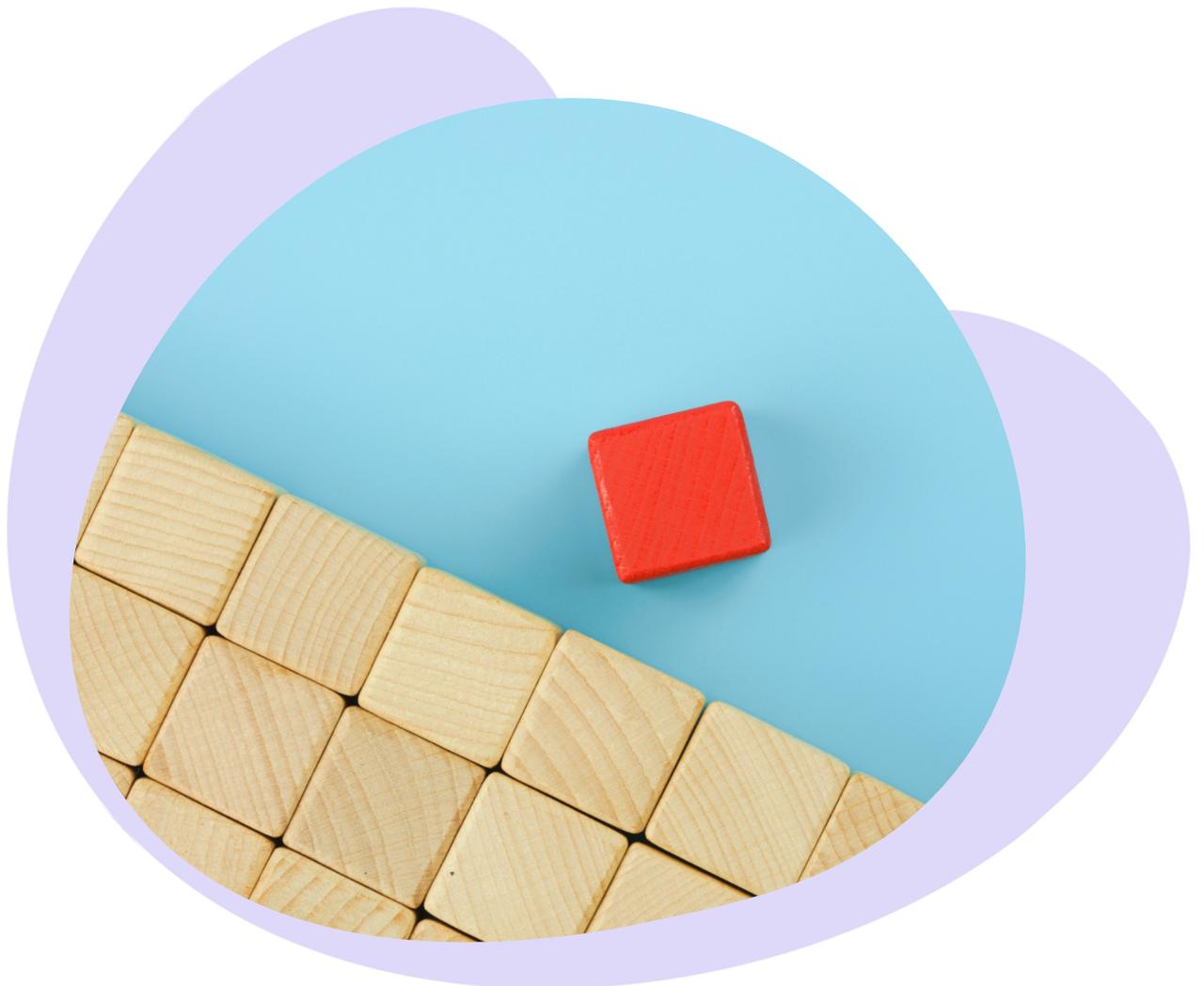
If you have an ERP or Warehouse Management System (WMS), investigate whether this functionality is available to you. With a proper system in place, you can track and flag unusually high or low inventory demand outliers to remove the risk of negatively impacting your demand forecasting accuracy.



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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.

Prioritize products

Prioritize 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 the demand forecasting technique you're using needs to be reviewed and improved.

Investigate whether your ERP or WMS has the functionality to automatically calculate demand forecasting errors. 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, maximize sales during peak seasons, prevent stockouts 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, there are many techniques and methodologies you can use 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.

To really boost your inventory forecasting accuracy, consider robust inventory optimization software like EazyStock.

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



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**Get started with
automated inventory
optimization**

Book a demo