WHITE PAPER

Your Complete Guide to Inventory Forecasting

What It Is, Why Companies Do It and How to Get Started

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What It Is, Why Companies Do It and How to Get Started

An accurate inventory forecast is invaluable, especially when supply chains and consumer demand are changing rapidly. Getting forecasts right requires a complex mix of statistical and mathematical data analysis, experience with the business and customer insights. It also requires people who can make data-informed predictions based on factors that could cause a dip or spike in future demand. Some factors are major, some peripheral. Some could make an entire season, while some have only a mild effect.

Technically speaking, inventory forecasting, also known as demand planning, is the practice of using data on trends and both past and upcoming events to predict the amount of inventory needed to meet future demand. Accurate forecasting ensures businesses have enough product to fulfill customer orders and that they do not spend too little or too much on inventory.

Forecasting is related to, but not the same as, deciding when to reorder, which is known as replenishment. Replenishment data—factors such as timing, availability and delivery speed, which are collectively known as lead time—is one factor that helps a business ensure it will have enough stock to meet demand when it comes time to order.

Effective inventory forecasting can mean the difference between profitability and piles of unsold goods that eat up your available cash. When used correctly, companies can better plan for potential dips or surges in sales, save money on storage and keep customers happy.

For instance, inventory forecasting provides the strategic insights a company needs to better align stock levels with business goals. It yields more reliable data, improving reporting, and ultimately boosts margins and profitability. Inventory forecasting can make it easier to automate other inventory processes and better manage supply chains and production cycles.

Accurate inventory forecasting also fuels customer and supplier satisfaction by minimizing the risk of stockouts, ensuring “hot” products are available and improving supplier relations. The bottom-line impact of inventory forecasting is clear: less money is tied up in inventory, stock is maintained at a realistic threshold and ordering becomes much more precise.

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CHAPTER 1

Common Inventory Management Challenges (And How Better Forecasting Helps)

Managing inventory can be a daunting task. The process and results impact every aspect of your business, so it's not surprising that a long list of challenges can accompany the effort. Let's take a look at a few common ones, and how accurate inventory management and forecasting can help minimize or avoid them altogether.

Managing Space

The most obvious place to start is in the warehouse. This is where a lot of inventory lives, and it's constantly changing and in motion. Inventory management in the warehouse is a labor-intensive and complex undertaking that involves steps such as receiving, putaway, picking, packing and shipping. The challenge comes from performing each of these tasks as efficiently as possible.

Meanwhile, simply managing the warehouse space itself is challenging. The combination of inventory management and forecasting helps the business optimize its use of warehouse space, and the quantity of each product, based on accurate demand data.

Obsolete Inventory

Also known as "excess" or "dead" inventory, obsolete inventory is stock a business doesn't believe it can use or sell due to a lack of demand. Obsolete inventory can negatively affect a company's overall financial health. As much as 20% to 30% of a business's inventory is obsolete at any given time, according to Manufacturing.net, and most or all of those goods can be written off as losses. That's a big number, and could represent the breaking point for a struggling organization.

What's more, obsolete inventory is often a self-induced problem. The most common causes are things like inaccurate forecasting, defective inventory management systems, poor product quality or design, sloppy purchasing or inaccurate lead times. Simply put, if a business is operating from incomplete or inaccurate inventory data, it will find itself acting based on estimates rather than verifiable information.

The harsh reality is that businesses waste a lot of money on obsolete inventory, and while writing off small amounts of inventory is often unavoidable, an accurate inventory management system that generates trustworthy forecasts can help to reduce obsolete inventory and minimize write-offs.

High Inventory Carrying Costs

Inventory carrying costs arise from keeping products shelved at a warehouse, distribution center or store and include storage, labor, transportation, handling, insurance, taxes, item replacement, shrinkage and depreciation. These costs often represent 20% to 30% of the total inventory value, and that number increases the longer products are held.

Carrying costs also happen to be one of the biggest inventory challenges companies face, and by tying up excessive resources on products sitting in their warehouse, companies can miss out on unknown opportunity costs.

Investing in an accurate inventory management solution is the most powerful way to reduce carrying costs, because they help companies find the optimal amount of inventory. The visibility the software delivers empowers purchasing, operations and other supply chain staff to make better decisions by establishing more consistent receiving, putaway and fulfillment processes and enabling them to trace every item while they're responsible for it.

Write-Downs

An inventory write-down is an accounting process that's triggered when inventory decreases in value, but does not lose its value completely. When the fair-market value of inventory drops below its book value, a journal entry is made and an inventory write-down reduces the value of the ending inventory for the reporting period, which has implications for both the income statement and balance sheet.

There are some basic strategies to reduce write-downs, such as avoiding ordering excess inventory, regularly reviewing order frequency, and tracking trends in demand and sales. The surest step a company can take is to implement an inventory management system that can automate many of these processes and provide reliable forecasts, thereby helping it to plan inventory purchases more precisely.

CHAPTER 2

Where to Start? Key Inventory Metrics

Meeting the myriad inventory management challenges that arise requires a combination of analysis and methodology. The analysis piece often starts with metrics that can inform and refine your forecasting efforts. Sales, receiving, operational and employee KPIs provide additional insights and a clearer picture of all things inventory-related.

Operational KPIs show how well your business is running. Improved internal business processes and metrics lead to more satisfied customers.

Examples of **operational KPIs** include:

- Average inventory: The amount of inventory a company has on hand during a period. The goal is for companies to keep their average inventory consistent over the course of a year.

Average inventory = (Beginning inventory + Ending inventory) / 2

- Lead time: The time it takes for a customer to receive a product after they order it. This KPI measures the efficiency of the entire supply chain.

Lead time = Order process time + Production lead time + Delivery lead time

- Lost sales ratio: The number of days a specific product is out of stock compared to the expected rate of sales for that product. A higher lost sales ratio is a sign a company is running too lean on its stock.

Lost sales ratio = (Number of days product is out of stock / 365) x 100

- Inventory carrying cost: The percentage of the total inventory value a company pays to store that inventory (as explained earlier). The total cost depends on which products a company carries, the number

of SKUs, the storage location, the inventory turnover rate and whether the company uses a third-party fulfillment provider.

Inventory carrying costs = (Inventory service costs + Inventory risk costs + Capital cost + Storage cost) / Total inventory value x 100

Sales KPIs can help sales teams win deals and collaborate more effectively. They should be set up to mesh with organizational goals and used to optimize sales performance. Examples include:

- Sell-through rate: A comparison of the amount of inventory sold versus that manufactured or received from a supplier. This metric provides an indication of the efficiency of your purchasing.

Sell-through rate = Number of units sold / Number of units received x 100

- Inventory turnover rate: The number of times a company sells and replaces its stock in a period, usually one year. The turnover rate can help to determine if a business has too much inventory relative to how much of that stock is selling.

Inventory turnover rate = Cost of goods sold / Average inventory

- Gross Margin Return on Investment (GMROI): This inventory profitability ratio can help a company gauge its ability to convert inventory into more cash than the inventory's original cost. Evaluating the GMROI of different products when developing inventory forecasts could affect how much of certain items a company stocks.

Gross Margin Return on Investment = Gross margin / Average inventory cost

- Accuracy of forecast demand: This offers a percentage of how close the actual on-hand quantity is to the forecast. It checks on what a company forecasted, ordered and sold in the prior period.

Accuracy of forecast demand = (Actual – Forecast) / Actual x 100

Employee KPIs, or labor KPIs, measure staff performance. The better the outcomes for employee KPIs, the better your business performs overall. These KPIs include:

- Labor cost per item: The total spent to produce one unit of product. This metric includes workers' wages and any additional costs of moving a product through production to sell.

Labor cost per item = Total number of units / Total labor expense

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CHAPTER 3

Forecasting Techniques and Methods

After calculating and considering the relevant metrics, businesses need to choose the right analysis technique, method and model based on how each option matches with their company's particular situation and characteristics.

However, at a basic level, the process can be distilled down to four basic steps.

To start, calculate your lead time demand, which is the amount of product you expect to use over the amount of time it takes to receive a replenishment order. Second, review sales trends by using one or a combination of the techniques below to help determine the lead time demand and plan safety stock.

Third, calculate safety stock—the inventory companies carry as a final line of protection against running out of items. The amount of safety stock a company carries will vary depending on its broader strategy. Some may adopt a just-in-time (JIT) approach where they attempt to align inventory deliveries with production schedules to only order inventory as the company uses it; others will keep far more stock on hand.

Safety stock = (Maximum daily usage x Maximum lead time) – (Average daily usage x Average lead time)

As a fourth and final step, you can use all of that information to set the reorder point for different items. When inventory levels fall below the reorder point, it's time to submit a purchase order.

Reorder point = (Number of units used daily x Number of days lead time) + Number of units safety stock

Choosing an Analysis Technique

Selecting an inventory analysis technique, or multiple techniques, that mesh well with the business is essential because it can drive insights that affect your forecasts. Many companies align with one of these common approaches to classifying inventory:

- ABC analysis determines the value of inventory items based on their importance to the business, ranking them according to demand, cost and risk data. A is for your most valuable products, typically the 20% of inventory that accounts for 80% of sales or profits; B represents the number

of mid-range products that do not fit in either A or C; C is for the largest number of products that sell the least or contribute least to profitability. This helps business leaders understand which products or services are most critical to the financial success of their organization and informs their decisions on purchasing and how much to hold.

- FSN analysis classifies inventory items according to their rate of consumption. They are broad classifications: F means fast-moving, S means slow-moving and N means non-moving. This technique helps to more readily identify items as "active," stocked beyond their rates of consumption or stagnant. Fast-moving items might be able to support price increases, while a business owner might consider discontinuing non-moving items. An online retailer could also organize a warehouse so that F products are the easiest and fastest to pick, for example.
- VED analysis looks at inventory based on its importance to an organization. V stands for vital, E for essential and D for desirable. Vital inventory is usually critical to production and must be tracked closely since running out would cause major problems. Not having essential items would have a significant impact on operations, but there may be a temporary substitute or a faster resolution than with vital inventory. Shortages of desirable inventory would cause only minor issues, and these products can be replenished quickly.
- XYZ analysis classifies inventory based on demand variability. Again, the classifications are broad: X indicates regular demand, Y indicates strong variability in demand and Z indicates demand that's irregular and difficult to predict. Companies can even combine the ABC and XYZ systems to segment their inventory for more precise ordering and stocking practices.
- The Economic Order Quantity (EOQ) formula can help companies determine the order quantity that will keep costs as low as possible. EOQ is generally best for organizations that have constant, predictable demand and ordering expenses that are stable over time. It takes into account demand, ordering costs and holding costs (in the formula below, D is demand in units, S represents ordering costs like shipping and H is holding costs, such as storage expenses).

$$\textbf{EOQ} = \sqrt{(2 \times D \times S / H)}$$

Choosing a Method

After selecting a technique that suits your organization, it's time to choose an inventory forecasting method to help your business determine the optimum amount of inventory to order. There are four main methods for successful inventory forecasting—trend, graphical, qualitative and quantitative—each of which relies on a different formula:

- Trend forecasting: This method projects possible trends and excludes seasonal effects and irregularities by using past sales and growth data. More granular sales data helps this forecasting method by showing how likely specific customers, as well as types of customers, are to purchase in the future.
- Graphical forecasting: Though the graphical method uses the same data as trend forecasting, some forecasters prefer this approach because it is visual. They can discern patterns from a series of data points and add sloped trend lines to graphs to examine possible shifts in direction that supply chain leaders might otherwise miss.

- Qualitative forecasting: When they lack historical data, some companies go straight to the source: their customers. Qualitative forecasting often involves complex data collection, such as focus groups and market research. Forecasters then flesh out models from this type of data.
- Quantitative forecasting: Considered more accurate than qualitative research alone, quantitative forecasting uses historical and numerical data. The more historical data a company has, the more precise the forecast usually is.

CHAPTER 4

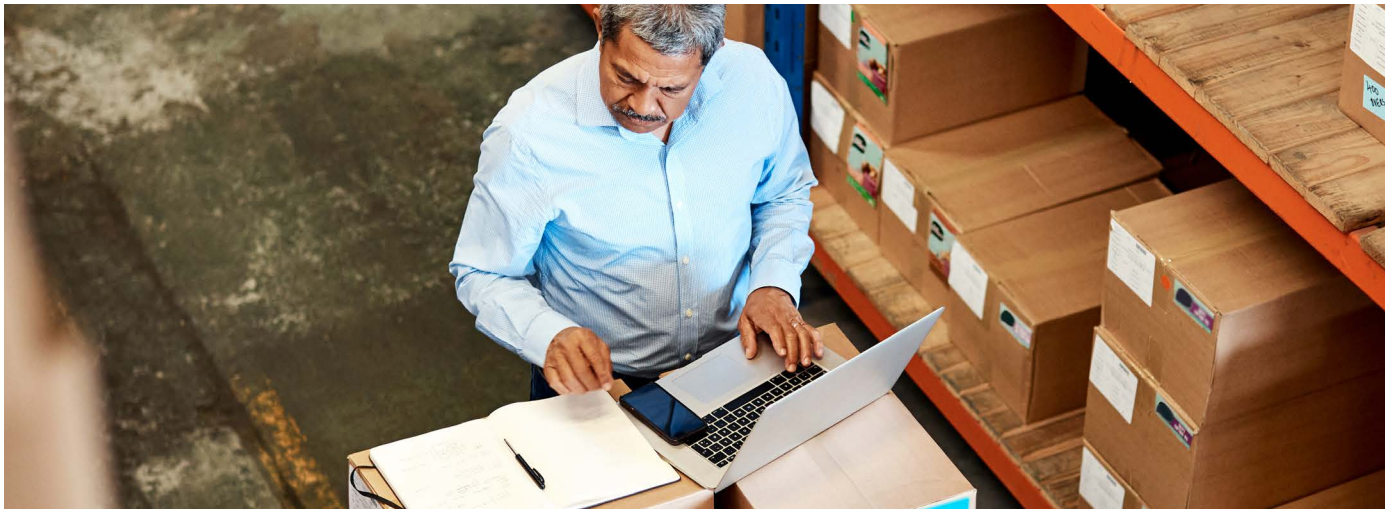
Creating an Inventory Forecast

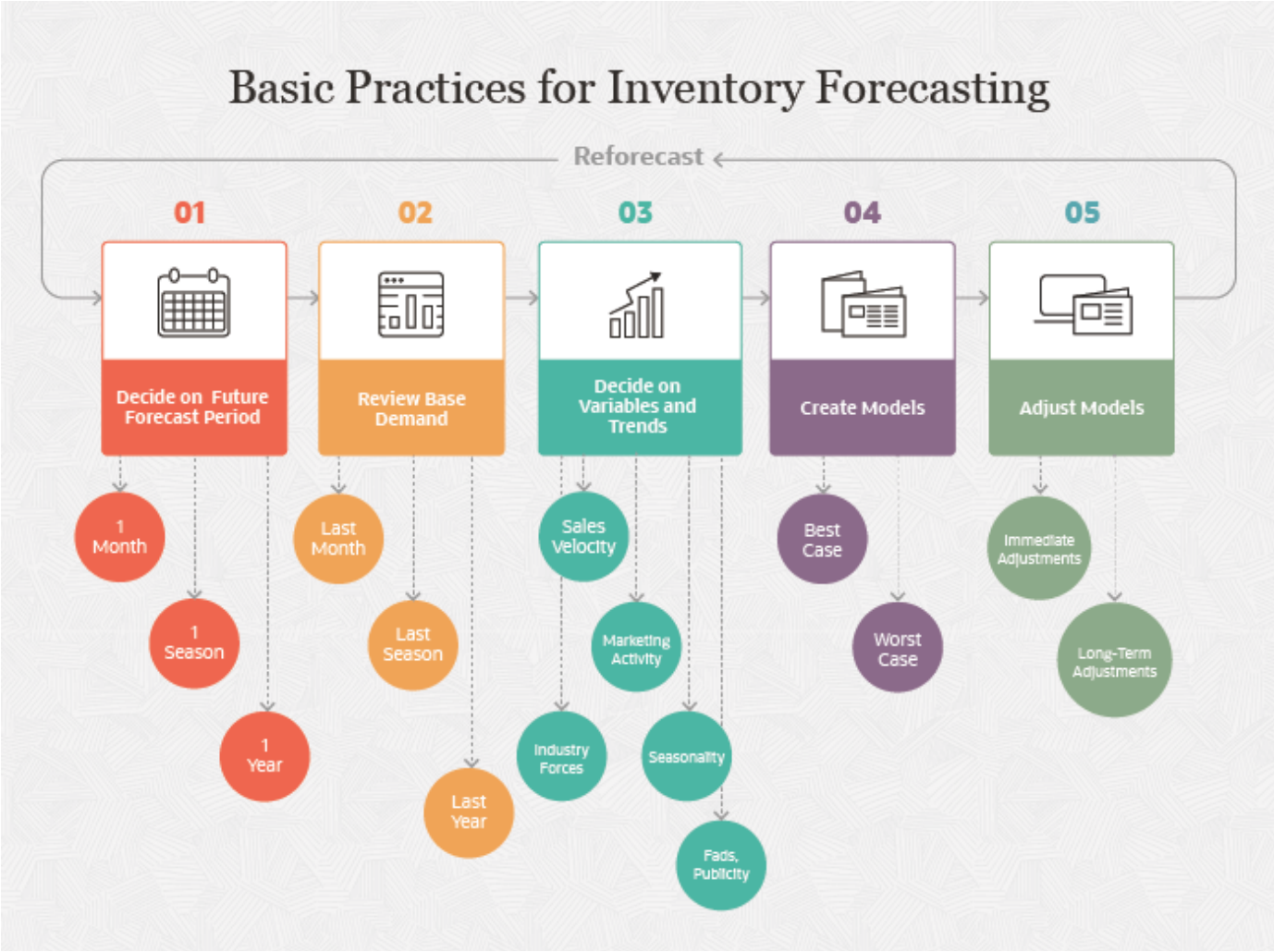
Creating an accurate and useful inventory forecast requires more than powerful software. It requires making a number of critical decisions to help ensure your forecasting efforts are successful. In the previous section, we reviewed the methods, models and analysis techniques to choose from to match your organization with the forecasting strategy that will serve it best.

Start by considering what data you have available and what you can collect. The process won't be the same for all organizations: Established companies should start with historical data and use the quantitative approach. Newer companies may want to—or have to—start by collecting qualitative market information.

From there, here are some recommended steps to help get your forecasting effort off on the right foot:

1. Decide on a future forecast period, typically 30 days, 90 days or one year.
2. Review the base demand for the chosen period; this will become the basis of your forecasting model.
3. Decide on trends and variables (such as promotions) and whether they will result in an increase or decrease in sales.
4. Review your sales velocity, i.e. how fast sales move through the company pipeline, based on the number of leads, average deal value, conversion rate and the metrics noted earlier.
5. Review marketing activity for opportunities that could give products a temporary boost.
6. Consider any pertinent industry forces like new competitors, supplier issues, etc.
7. Review seasonality as it affects each product.
8. Factor in fads or unpaid publicity, including social media activity, and make plans for any additional stock requirements.





With those steps taken, it's time to create the model by matching collected trends and historical knowledge with one of the techniques described earlier. Data should be cleaned to determine if there is missing information and whether it's okay to proceed anyway. The organization should choose a statistical approach, and then load the data or put it in a spreadsheet that the model's algorithm can understand. Establish parameters for the model with best- and worst-case data points, and then validate the model using different data than was used to calibrate it.

From there, forecasting becomes an exercise in regularly adjusting the model, especially when events require, and engaging in constant reforecasting. Remember, the model will constantly change; reforecasting is critical to keeping pace with the business.

CHAPTER 5

How Inventory Management Software Can Help

An inventory management system helps organizations account for all incoming and outgoing stock to better meet customer demand and avoid the expense of overstock or loss of business with stockouts. For products-based companies, the system impacts every essential business function, including accounting, purchasing, production, warehouse management, sales and customer service.

At its most basic, an inventory management system provides a way to store, organize, manage and analyze inventory data. Inventory management software should support real-time updates on product quantities and location, enable fast, actionable inventory monitoring and control and be easy to use.

Underneath those core requirements are critical features that can help manage, control, track and plan inventory. Here's what to expect from those features:

1. Inventory Control handles products that are already in stock at the warehouse and plays a key role in supply chain management. Inventory control tools can categorize products by type, location and SKU (or serial number). They also allow users to audit data, generate reports in real time and search, filter and view products.
2. Inventory Management governs the data from other parts of the system, like inventory control. Inventory management also handles business processes that occur before the stock arrives at a warehouse and after it leaves for another destination.
3. Inventory Tracking monitors the status of products and materials in the supply chain, helping to automate manual tasks such as generating tracking numbers after creating a receipt or invoice.
4. Inventory Barcoding functionality helps eliminate data entry errors and automate business functions that require communication with other parts of the system. This feature can speed up back-office processes.
5. Inventory Optimization adds sophistication to a basic inventory plan, replacing standard formulas and processes with tools that provide automated reports, inventory trends and visibility across the entire supply chain. This information leads to better inventory forecasting so you can optimize the amount of inventory on hand.
6. Inventory Alerts trigger notifications via email or text that let employees know of low inventory levels or delays that help to reduce waste, improve inventory financials and manage customer expectations.

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All of the functionality listed above can give you a better understanding of your inventory position and all the information that might factor in to more accurate inventory forecasts. Many inventory management solutions also offer either built-in or complementary demand planning engines that use sales forecasts or historical data to predict your needs.

Whereas in the past inventory management software was really only available to large companies, today, organizations of all sizes can enjoy the benefits of these systems, which are designed for everything from small businesses to enterprises.

Some cloud-based offerings now provide inventory management options for diverse situations, while also presenting lower upfront costs, automatic updates with the latest features, configurable and user-friendly interfaces and simplified integration.

The Bottom Line

Striking a balance between having enough-but-not-too-much stock can mean the difference between success and failure for a business, since inventory is often one the largest expenses for a company. NetSuite offers a suite of native tools for tracking inventory in multiple locations, determining reorder points and managing safety stock and cycle counts. And NetSuite's demand planning application puts inventory forecasting in your grasp, enabling users without extensive data management knowledge to determine order quantities and frequency for various products.

Too many businesses overlook the potential of inventory planning to offer a strategic advantage. Many carry too much stock simply to avoid the potential of running out, but that drags down the bottom line. Others adopt a lean inventory approach and then don't have the goods customers want to buy, which obviously hurts revenue. The techniques and technology required to strike the right balance are widely available, empowering businesses to manage their inventory more effectively. That should inspire business leaders to take action.

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