

# SUPPLY CHAIN MANAGEMENT-1

## Unit-II

### **Planning Supply and Demand in a Supply Chain:**

#### **What is planning supply and demand in supply chain?**

While **demand planning involves forecasting customer demand, supply planning determines how a business will fulfill that demand while still meeting its financial and service goals.** Therefore, supply planning should factor in various aspects related to inventory production and logistics.

#### **What are the Aspects of Demand Planning?**

Demand planning spans several aspects, with the three primary areas being:

#### **Product Portfolio Management**

Product portfolio management oversees the overall product lifecycle, beginning with the introduction of a new product through to its end-of-life planning. In many cases, product lines are interdependent, and understanding how new products may influence demand for other products is important to understanding the overall product mix required to maximize market share.

#### **Statistical Forecasting**

Using historical data, statistical forecasting creates supply chain forecasts with advanced statistical algorithms. In this area, it is important to determine the accuracy of each model, identify outliers and exclusions and understand assumptions. Seasonal shifts (think the spurt of holiday shopping that occurs between October and December for retailers, or the boost in yard equipment sales in spring months) can also be assessed with statistical forecasting.

#### **Trade Promotion Management**

Trade promotion or marketing events can influence demand, especially in the retail industry. The goal of a trade promotion is to help a brand connect with a customer, often through an in-store giveaway, discount, or promotion, and these events can impact the demand for a product.

#### **Why is Demand Planning Important?**

If product isn't available for customers to purchase because it's out of stock, businesses lose out on revenue, and over time, they could lose the customer to a competitor. On the other hand, sitting on a slew of unused inventory incurs both space and production costs unnecessarily. With demand planning, business leaders can stay in front of market shifts and make more proactive decisions, while being responsive to their customers' needs.

How do you plan a supply and demand?



**Demand planning is a supply chain management process of forecasting, or predicting, the demand for products to ensure they can be delivered and satisfy customers.** The goal is to strike a balance between having sufficient inventory levels to meet customer needs without having a surplus.

**Why demand and supply planning is important?**

**Why Is Demand Planning Important?**

Effective demand planning delivers both profit and customer satisfaction by helping businesses strike the right balance between sufficient inventory levels and customer demand.

What are the steps in demand planning?

**Step by step guide to demand planning strategy**

1. Step 1: Implement inventory technology. ...
2. Step 2: Collect data. ...
3. Step 3: Organize and analyze data. ...
4. Step 4: Select your demand forecasting method. ...
5. Step 5: Forecast demand. ...
6. Step 6: Make decisions & plans based on forecasted demand.

**Managing Predictable Variability:**

**What is predictable variability in supply chain?**

Predictable variability is **change in demand that can be forecasted.**  Can cause increased costs and decreased responsiveness in the supply chain.

What is variability in supply chain management?

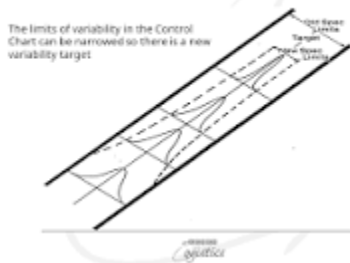
Within the Supply Chain, variability is **a term used to describe the level of inconsistency, or volatility, in the flow of materials from one end thru to the other end of the Supply Chain.**

**What is predictable variability?**

Predictable variability is **change in demand that can be forecasted.**  Can cause increased costs and decreased responsiveness in the supply chain.

## What is variability in supply chain management?

### Reducing Variability in Supply Chains



In supply chains, Variability is **the term associated with the difference between actual and planned lead times, which are not static**. Variability exists at all tiers of a supply chain: supply of materials and components, production through various machines and deliveries to customers. How to manage supply in order to improve balance between supply chain and predictable variability?

### How to Manage Demand Variability and Other Supply Chain Risks

1. Maintaining Healthy Relationships with Suppliers.
2. Utilizing Alternative Supply Sources.
3. Minimizing Lead Times.
4. Updating Inventory Policies.
5. Aligning Supply and Demand Management.
6. Implementing Demand Forecasting Software.

### What are the 5 types of variability?

#### Five Types of Variability

- Arrival variability. ...
- Request variability. ...
- Capability variability. ...
- Effort variability. ...
- Subjective preference variability. ...
- Diagnose the problem. ...
- Design a mutually beneficial operating role for customers. ...
- Test and improve the solution.

### What is predictive analysis in supply chain?

By looking at historical metrics for supply chains such as total shipments versus capacity utilization, traffic volumes along a particular route during peak times, etc., predictive analysis can **predict the future needs of a business based on what has happened previously in similar situations**.

## **Managing -Economies of Scale in a Supply Chain:**

### **How do you scale supply chain?**

#### **5 Steps to Streamlining Your Scale Up Processes In Your Supply Chain**

1. 1.) Assess Your Risk Profile. ...
2. 2.) Check Your Supply Chain's Capabilities. ...
3. 3.) Implement Real-Time Visibility Whenever Possible. ...
4. 4.) Ignore Channel Distribution at Your Own Peril. ...
5. 5.) Hybridization over Standardization.

### **What is economies of scale and supply chain?**

Economies of Scale - SCM Portal - Demand & Supply Chain Glossary - **The benefits that come from having large or very large operations.** In economics, the term means the reduction in a producer's average cost per unit that results from having large output compared with that of competitors.

### **What is scalable supply chain?**

Scalability refers to a **logistics provider's ability to ramp up – or down – service based on need.** With proper scalability, businesses can adjust their logistics services and control costs based on anticipated volume.

## **1. KNOW THE MANUFACTURER LIFECYCLE STATUS OF YOUR OFF-THE-SHELF COMPONENTS**

The lifecycle of your electrical components can change without warning, leaving you high and dry when it comes time to scale. Know your distributors, and be on the lookout for changes due to regulations, mergers, or new management. Divisions of component manufacturers can get bought and sold frequently, meaning that your components could be assigned a new part number and issued a new specification. And [new regulations](#) (RoHS, REACH, conflict minerals, ISO) force manufacturers to review their product lines and discontinue non-compliant parts.

To make sure that unforeseen events don't seriously stall the development of your product, make sure that you're always aware of the lifecycle status of each component.

## **TIP 2. KEEP COMPLETE DOCUMENTATION FOR YOUR CUSTOM PARTS**

Because custom parts require more detailed instruction and attention in the production process, it's a good idea to err on the side of too much, rather than too little, documentation. Thorough documentation and revision management will satisfy all regulatory, design, operations, production, service, and quality needs. For efficiency sake, this should all be stored in a cloud PLM system.

It also doesn't hurt to familiarize yourself with the steps involved in building your components, since this information could help a new supplier ramp up quickly and successfully.

### **TIP 3. WATCH FOR SIGNS OF SUPPLIER INSTABILITY**

It's never easy to predict when a supplier is becoming unstable, but there are some classic signs that should raise a red flag. For example:

- Have you noticed substantial and/or unexplained changes in part pricing or lead times?
- Are your deliveries usually on time, or do they vary without warning?
- Have you seen any inconsistencies in quality?
- Do you run into problems when you try to communicate with a certain CM?

Once you start paying attention to signs of instability, you will be prepared to correct any problems before a serious disaster hits.

### **TIP 4. DON'T SKIMP ON KEY CONTRACTS**

You likely have contracts with all of your suppliers, but there are certain relationships that you may want to give some added attention. We recommend drawing up a more comprehensive contract with key component providers—one that requires early notification of changes and establishes priority in shortage and backorder situations.

Essentially, your contracts should establish what you are entitled to in your supplier relationships, helping you avoid any last-minute surprises.

### **TIP 5. MONITOR VENDOR HEALTH ON A REGULAR BASIS**

Change can sneak up on you, and what you believe to be true may not always be the case. Even if you thoroughly vetted your suppliers at the time of establishing the relationship, when was the last time you audited any of them? What about calling to check in on how they're doing?

It's a good idea to understand how their business is going and pay attention to any news that could impact your business. So, start at the beginning, with a conversation. Did you miss Part I of this series? If so, [check it out now](#).

### **Cycle Inventory:**

Cycle inventory is the products, materials or raw ingredients that a company keeps to fulfill its minimum production quotas. Cycle inventory is crucial to the company's operations because regular business operations use or "cycle" the inventory frequently.

#### **Why is cycle inventory important?**

Cycle inventory is important because it provides the materials a business needs for its daily operations. The frequent cycling of inventory means that the business must replace the inventory it uses, and the overall success of the business's production efforts can hinge on the organization, management and tracking of cycle inventory.

Both B2B, or business-to-business, and DTC, or direct-to-consumer, businesses track and manage cycle inventory. Many businesses use modern inventory software for greater accuracy, scalability and organization of information.

#### **Factors that impact cycle inventory**

There are several factors that impact the availability, refreshment and organization of cycle inventory. These can include:

##### **Demand**

Demand for the company's products can have a major impact on cycle inventory, as higher demand can drive more frequent cycling and requires better management and organization. When demand is lower, the company might keep less inventory in stock and spend less money on production.

For example, if a bakery keeps flour in its warehouse for loaves of bread, it requires a certain amount of flour to meet its typical order amount. Tracking this cycle inventory ensures the bakers have enough flour for each batch of bread and that the company can respond to increases or decreases in demand efficiently.

## **Order costs**

The cost of ordering cycle inventory also affects its availability and how much the company keeps in storage. Order costs include the costs of bringing freight in, in addition to tracking and storing it. If shipping costs, like fuel and driver wages, are higher, the cycle inventory price might increase for the company.

For example, if the same bakery requires cane sugar for its bread and fuel prices rise significantly, the company might experience an increase in its order costs. The increase in fuel costs means the shipper or the facility that processes raw sugar might increase its prices to cover rising fuel costs.

**Related:** [Average Cost Method for Inventory Management and Accounting](#)

## **Lead time**

Lead time is the amount of time that passes between the company placing an order and the merchandise arriving. Higher lead times mean the company has to plan ahead more frequently to meet its basic demands. Lower lead times mean the company has more time between orders and might avoid higher shipping costs for expedited merchandise.

For example, if there is a flour shortage, the bakery might need to order its cycle inventory of flour up to a month in advance to meet its demands. The company might find a better supplier locally, but costs may be higher.

## **Holding costs**

Holding costs are any monetary costs associated with the storage of the company's inventory. This can include material handling costs for moving materials in and out of warehouses or production areas, property costs for warehousing space, insurance to protect stored materials and employee wages. Low holding costs for cycle inventory can help the business make its products cheaper and often quicker.

For example, if the bakery stores its eggs in an industrial cooler, the cost of maintaining the cooler is part of its holding costs. The company can reduce the costs of holding eggs by reducing the lead time between egg orders and producing batches of baked goods.

**Related:** [Q&A: Is Inventory an Asset?](#)

## **Product price**

The price of the final product also affects cycle inventory because price fluctuations and demand might create a need for alternative materials or greater production. Companies typically raise product prices in response to increased market demand or increasing raw materials and production prices.

For example, if the bakery's raw cane sugar costs rise by 15% due to a shortage, the company might raise the prices of its baked goods in response. This helps the company cover its basic expenses and still create a profit with the final product.

### Discounts

Sometimes, a supplier or vendor offers a discount to a company for ordering items in bulk. This helps the company reduce its cycle inventory costs and, therefore, the cost of producing the final item. Discounts can make holding more cycle inventory practical, as companies might want to buy raw materials at discounted prices while they last.

For example, if the bakery's vanilla extract supplier offers a limited-time discount of 12% per gallon to reduce inventory, the bakery might take advantage of the discount to reduce future production expenses by buying more than it needs for the month.

### Why is cycle inventory used?

Cycle stock plays an important role in a business's daily operations because it's used **to fulfill most sales orders**. Without it, a company would not have enough inventory available to meet customer demand and the business would not last long. This stock is also critical to businesses generating cash flow.

### What is a cycle stock example?

Cycle Stock Inventory Definition

For example, **a retailer's on-hand inventory would include the items on store shelves as well as most of those in a store room or stock area**. Over time, cycle stock inventory refreshes itself, or turns over, as new items replace older ones that are sold.

What is order cycle in inventory?

Order Cycle is **the number of days required for a seller to use up a vendor's supply to meet the supplier's target order requirement**. It also tells the seller how much stock is used and needed before placing a replenishment request.

### Tips for managing cycle inventory

Here are some tips to help manage your cycle inventory:

- **Maintain good records.** Good inventory records help you account for inventory and determine the company's inventory needs. Keep good records to ensure accuracy and to account for any excess inventory.
- **Use inventory software.** Inventory software can help reduce the manual workload of managing inventory. Consider inventory software for a more efficient management method.



- **Perform frequent calculations.** Prices and vendor rates may change with markets, demand and scarcity of supplies. Perform frequent calculations to determine the most cost-efficient inventory ordering methods.
- **Communicate with vendors.** Communicating frequently with vendors and suppliers can help you learn more about the supply chain and keep you updated on changes in price or material availability. This may help you account for changes in supply chains more effectively and quickly.

### **Managing Uncertainty in a Supply Chain:**

Supply chain uncertainty refers to the change of the balance and profitability of the supply chain caused by potential and unpredictable events, which requires a response to re-establish the balance. An event can be an unexpected order, late delivery from a supplier or a breakdown of critical production equipment.

#### **How do you deal with uncertainty in supply chain management?**

We can **use inventories as a cushion** to deal with unforeseen events and abrupt changes to the offer and demand. Supply chains must respond to real demand, keeping a prominent level of service for clients. However, the best option is for us to continuously optimize the inventory based on a solid forecast.

#### **What are the 5 supply chain levers to deal with uncertainty?**

**Capacity, inventory, time, information, and price** are the five levers that a supply chain can use to deal with this uncertainty.

#### **Why demand uncertainty is very important in supply chain management?**

Demand uncertainty refers to the external factors that cause demand to unexpectedly increase or decrease. This situation can be caused by a public health crisis or even a sudden shift in the customers' tastes. **Many software help companies to forecast demand and develop relevant production and supply chain strategies.**

#### **What are the major sources of uncertainty in this supply chain?**

The major sources of uncertainty are **fluctuations in demand and price.**

#### **What is the impact of uncertainty in supply chain?**

In supply chain planning, uncertainty **causes dynamic tension**: do all the right things to improve the forecast, and hit a ceiling on the way to accuracy. The fact is, inherent in supply chain planning are volatility and randomness of thousands, if not millions, of individual buying decisions and supplier activities.

### **Safety Inventory:**

What is safety stock in supply chain? Safety inventory is carried to satisfy demand subject to unpredictable demand fluctuations and to reduce product shortages. This type of inventory cushion is also called safety stock or buffer inventory.

### **What is the purpose of safety inventory?**

Safety stock inventory, sometimes called buffer stock, is the level of extra stock that is maintained **to mitigate risk of run-out for raw materials or finished goods due to uncertainties in supply or demand.**

### **How do you use safety inventory?**

To calculate safety stock, work out your average daily use for a product and multiply it by its average lead time – how long it takes, in days, to arrive once you place an order. Then subtract this number from your maximum daily use times your maximum lead time. The result is the safety stock number for that product.

### **What are the factors affecting the level of safety inventory?**

Recalling that safety stock is a function of three main factors: **uncertainty in the forecast, the number of days to cover (order period), and the confidence factor of the product.**

### **What are the 3 main objectives of inventory control?**

Objectives of Inventory Control

**To keep inactive, waste, surplus, scrap and obsolete items at the minimum level.** To minimize holding, replacement and shortage costs of inventories and maximize the efficiency in production and distribution. To treat inventory as investment which is risky.

### **What are the 4 ways to reduce safety inventory?**

**As explained by Supply Chain Management Review, leaders should utilize data and follow these tips to reduce safety stock:**

- Gain better visibility into your inventory.
- Consider upgrading your WMS.
- Track all inventory by SKUs and bin location.
- Optimize slotting practices.
- Connect all systems.

### **What are the four 4 categories of inventory?**

There are four different top-level inventory types: **raw materials, work-in-progress (WIP), merchandise and supplies, and finished goods.** These four main categories help businesses classify and track items that are in stock or that they might need in the future.

## **4 primary reasons for carrying safety stock**

Safety stock inventory is more than just a “nice thing to have”; it’s a necessity. These are the top four reasons why even small- and mid-sized businesses should carry safety stock inventory.

### **1. Protect against unforeseen variation in supply**

For example, if your supplier is unexpectedly closed for a week or if there is a disruption of your order in transit, you don’t waste time fulfilling orders to your customers with safety stock. Supply chains are longer and more globalized, with more forces causing disruptions than ever before.

### **2. Compensate for forecast inaccuracies (only when demand exceeds the forecast)**

Perhaps you have a consistent demand for a certain item but one month you sell more than you forecasted; with safety stock inventory in place, you don’t sacrifice your customer service level while you replenish.

### **3. Prevent disruptions in manufacturing or deliveries**

The purpose of safety stock is to make sure your customer service levels stay high – and your supply chain runs smoothly. With safety stock in place, your workers are not running around trying to constantly locate and reorder parts – they’re fulfilling orders to your customers.

### **4. Avoid stock outs to keep customer service and satisfaction levels high**

The real goal of safety stock? Keeping customers happy. While safety stock also helps to keep your warehouse and supply chain running smoothly, the end goal is to make sure that your customers will be satisfied and keep coming back.

But it's important to keep in mind that, like the rest of your inventory, safety stock requires more than just a "one size fits all" approach. With rule-based approaches, the safety stock inventory determinations are relatively static and not linked to other important factors, such as service level, forecast accuracy and lead time variability. Since each SKU in your inventory has a unique demand pattern, you need to adjust your safety stock levels accordingly.

Rule-based approaches are proven to be less effective in determining optimal inventory levels for many operations. Plus a sound, mathematical approach to [safety stock calculations](#) will not only justify the required inventory levels to business leaders, but also balance the conflicting goals of maximizing customer service and minimizing inventory cost.

