SUPPLY CHAIN MANAGEMENT

UNIT-I

Supply chain:

A supply chain is a connected system of organizations, activities, information and resources designed to source, produce and move goods from origination to a final destination—typically from a supplier to an end customer. Modern supply chains are often very complex, spanning multiple countries and involving many steps

The Key Steps in a Supply Chain:

At their most basic, the key steps in a supply chain include:

1. Original sourcing or extraction of raw materials
2. Refining or manufacturing materials into basic parts
3. Assembling basic parts into finished products
4. Selling finished products to end users
5. Delivering finished products to end users or consumers

Between each of these steps, several activities need to take place, including:

- Documentation, contracts and other information that define expectations throughout the supply chain
- Physical movement of goods from one location or organization to another
- Storage of goods until they are needed
- Stock and inventory tracking and management
- Demand and supply management
- Tracking and authentication of goods
- Onward logistics and distribution of goods to the end customer

The act of creating, managing, tracking and optimizing a supply chain is known as supply chain management (SCM). SCM activities are carried out by a team of specialist supply chain managers.

Effective supply chain management relies on everyone involved in the supply chain network providing timely, accurate and consistent information to identify issues and streamline the process.

What are the 5 basic steps of supply chain management?

Supply management is made up of five areas:
> **supply planning,**
> **production planning,**
> **inventory planning,**
> **capacity planning,**
> **and distribution planning**.

 Supply planning determines how best to fulfill the requirements   created from the demand plan.

What are the four 4 stages of supply chains?

What are the components of your supply chain you should be focusing on right now?

- INTEGRATION. Integration starts at your strategic planning phase and is critical throughout your communications and information sharing and data analysis and storage. ...
- OPERATIONS. ...
- PURCHASING. ...
- DISTRIBUTION.

Supply chain functions:

What are the 7 supply chain functions?

Supply Chain includes
- **purchasing,**
- **manufacturing,**
- **warehousing,**
- **transportation,**
- **customer service,**

- **demand planning,**
- **supply planning and**
- **Supply Chain management**.

What is the function of SCM?

Supply chain management (SCM) refers to the management of operations that are involved in the procurement of raw materials, their transformation into finished goods, and their distribution to the end consumer. The simplest supply chain includes your suppliers, you, and your customers.
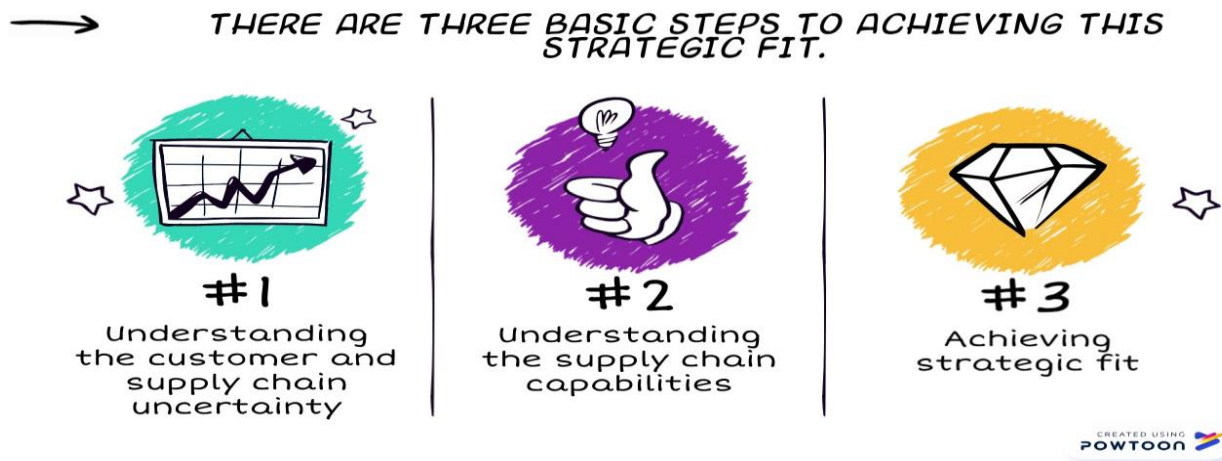
What are the 4 main members in every supply chain?

There are four kinds of participants in every supply chain. They perform the activities that make a supply chain work and provide a reason for it to exist. These participants are:
1) **producers;**
2) **distributors or wholesalers;**
3) **retailers; and**
4) **customers or consumers**.

Achieving strategic fit in supply chain:

Strategic fit **requires that both the competitive and supply chain strategies of a company have aligned goals**. It refers to consistency between the customer priorities that the competitive strat- egy hopes to satisfy and the supply chain capabilities that the supply chain strategy aims to build.

THERE ARE THREE BASIC STEPS TO ACHIEVING THIS STRATEGIC FIT.

#1 Understanding the customer and supply chain uncertainty

#2 Understanding the supply chain capabilities

#3 Achieving strategic fit

CREATED USING POWTOON

Scope in supply chain drivers and metrics :

What are the major supply chain performance metrics?

There are three main categories of supply chain performance metrics; time, cost and quality

What is supply chain drivers and metrics?

Five supply chain drivers,
- ➢ **Production,**
- ➢ **Inventory,**
- ➢ **Location,**
- ➢ **Transportation,**
- ➢ **and Information**, influence the performance of the supply chain. Companies can develop and manage these drivers to emphasize the ideal balance between responsiveness and efficiency, depending on your business and financial requirements.

Production

To achieve a responsive supply chain, ensure your factories have excess capacity and use flexible manufacturing techniques to produce a wide range of items. Flexibility allows production to pivot to meet fluctuations in consumer demand quickly. Additionally, having multiple, smaller production facilities close to distribution centers and customer hubs increases consumer demand responsiveness by decreasing delivery time.

Alternatively, having production facilities with little excess capacity and optimized for producing a limited range of items increases efficiency. Centralizing production in large central plants for better economies of scale furthers efficiency, though delivery times may be longer for some customers.

Inventory

When it comes to inventory as a driver, optimizing responsiveness often dictates stocking higher product levels and at more warehouse locations. Efficient inventory allows for unexpected fluctuations in demand that can be met promptly. However, this approach incurs higher storage costs and must be weighed against the benefit of widespread availability.

Efficiency in inventory management calls for reducing inventory levels of all items, especially those that do not sell frequently. Also, stocking inventory in only a few central distribution centers achieves economies of scale and cost savings.

Location

Prioritizing responsiveness for the location driver often involves maximizing convenience by establishing many locations near customer groups. For example, fast-food chains use location to be very responsive to their customers by opening many stores in high-volume markets. Many sites allow them to respond quickly to consumer demand but increase operating costs by operating many stores.

Efficiency is achieved by operating from a select few locations and centralizing activities. An example of efficiency in location would be how e-commerce retailers serve global markets from only a few central locations, performing a wide range of activities. While this allows each site to be more efficient, it also makes them susceptible to disruptions, as seen with the coronavirus outbreak.

Transportation

Faster modes of transportation, such as air freight–while often more expensive–allow for shorter delivery times and greater response flexibility. FedEx and UPS are two companies that provide high levels of responsiveness in last-mile delivery by using transportation to deliver products often within 48 hours.

Efficiency in transportation is emphasized by moving products in larger batches, less often, by bulk carriers such as ships or railroads. This type of transportation is more efficient when products originate from a centralized distribution center instead of multiple separate locations.
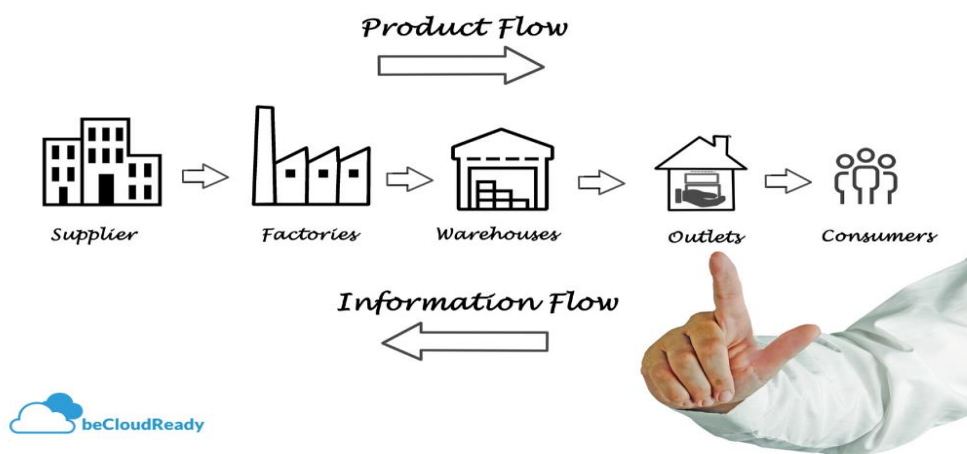
Information

Information's power as a driver is growing as the technology for collecting and sharing information becomes more widespread, easier to use, and more affordable. Software with analytics uses internal and external data to make decisions that enhance the performance of supply chain drivers. Your supply chain should collect and share accurate and timely data generated by the previous four drivers in operation for ultimate effectiveness.

While the cost of the first four supply chain drivers continues to rise, market-leading supply chain solutions enable companies to make the best use of information to increase their internal responsiveness and efficiency through collaboration and end-to-end visibility. Scenarios prepare supply chain managers to respond quickly and make strategic, well-informed decisions based on key supply chain drivers when situations and disruptions like the COVID-19 pandemic arise.

The Right Mix of Responsiveness and Efficiency

Even within a supply chain that emphasizes responsiveness, some segments focus on efficiency and vice versa. Using predictive planning software allows for many variables to be considered. With advanced, AI-driven analytics, companies can realize the ideal balance between responsiveness and efficiency for any supply chain decision.

Demand forecasting in supply chain:

Demand forecasting is important to the supply chain because **it helps to inform core operational processes such as demand-driven material resource planning (DDMRP), inbound logistics, manufacturing, financial planning, and risk assessment**.

Demand forecasting methods:

- **Demand forecasting – macro-level:** Macro-level demand forecasting looks at general economic conditions, external forces, and other broad influences that may disrupt or affect the business. These factors help inform businesses of regional and global risks or opportunities, and keep them be aware of general cultural and market shifts.
- **Demand forecasting – micro-level:** Demand forecasting at the micro level can be specific to a particular product, region, or customer segment. Micro-level forecasting is especially attuned to one-off or unexpected market shifts that might lead to a sudden spike or plunge in demand. For example, if experts are predicting a heat wave in New York and your company makes portable air conditioners, it may be worth the calculated risk of preemptively bumping up your inventory buffers in that area.
- **Demand forecasting – short-term:** Short-term demand forecasting can be at the micro or macro level. It is usually done for a period of fewer than 12 months to inform day-to-day operations. For example, it may involve consulting with the company's sales and marketing teams to see if they're planning any promotional or sales events that might cause a demand spike.
- **Demand forecasting – long-term:** Long-term demand forecasting can also be micro or macro, but typically looks ahead longer than one year. This helps businesses make better-informed decisions about things like expansion, enterprise investments, acquisitions, or new partnerships. When businesses give themselves a year or more to analyze and test markets, they can get a more robust picture of what kind of demand trends they can expect when they set up shop or launch products in new countries or regions.

Why is demand forecasting important in supply chain?

Demand forecasting plays an important role in effective supply chain management, **ensuring timely stock replenishment, enhanced capacity management, and optimal sales and revenue**. It also improves decision-making and management, while accelerating prospective plans for growth and expansion.

How Can Demand Forecasting Benefit Your Business?

Demand forecasting brings a wealth of benefits to retail businesses whose long-term health and continuity depends on accurate stock predictions. And the benefits aren't limited to maintaining excellent customer service levels; they can drive improvements across multiple functions, bolstering business confidence and helping a firm realise its ambitions for growth.

Below, we take a closer look at some of the benefits you could enjoy by embracing demand forecasting.

- **Reduced uncertainty** – Uncertainty is always a negative when it relates to supply chain management. It hampers decision-making, causes delays, and impacts stakeholder confidence. Demand forecasting can remedy uncertainty, ensuring that supply-related functions are adequately resourced, and that managers are better informed to make effective decisions that encourage growth and progress.

- **Enhanced supply infrastructure** – Anticipating highs and lows in demand is essential for the health of your supply infrastructure. Demand forecasting supports enhanced supply chain management by optimising capacity, stock replenishment, and the streamlined management of warehouse personnel.

- **Increased revenue** – Understanding when products are likely to sell, and in what volumes, can lead to significant increases in revenue. Demand forecasting also means optimal product availability, so you never miss a sale.

- **Reduced need for safety and surplus stock** – The more inventory in your warehouse, the slower the turnaround of stock and the greater the impact on your bottom line. Demand forecasting reduces the need for safety stock, so you can cut inventory costs while focusing on the most profitable products.

- **Improved fulfilment = better long-term customer advocacy** – Demand forecasting means more of your products are available more of the time, which can be a huge boon from a customer advocacy perspective. Improving order fulfilment through accurate demand forecasting can encourage repeat customer and word-of-mouth recommendations, boosting your revenue and customer base.

What Internal and External Factors Have the Greatest Impact on Demand?

When forecasting demand, it's necessary to consider a broad range of factors that directly and indirectly affect supply. These include both internal and external variables, which together have a significant impact on sales volumes and required stock at different times throughout the year.Let's take a closer look at the factors you should consider when forecasting demand.

Internal Factors:

- **Promotional sales periods** – Consider how sale periods and markdowns could result in a spike in demand.

- **Ongoing marketing activity** – From SEO and paid media to display ads in local newspapers or billboards; how might ongoing marketing activity affect supply and lead to a rise in demand in the coming weeks and months?

- **Price changes** – Are product prices scheduled to change in the coming months? How might this affect demand in the short and long term?

- **In-store promotions and displays** – If you manage a physical store, how might promotional campaigns, displays, and POS promotions affect demand for certain products?

- **Expiration and best before dates** – Do you stock perishable items? Consider how expiry dates can lead to fluctuations in demand, and plan promotional periods accordingly to limit stock wastage within your supply chain.

External Factors:

- **Customer trends and buying habits** – How might changing customer trends and buying habits affect demand? This is particularly important when assessing future, long-term demand.

- **Competitor activity** – What are your competitors doing to attract sales and drive demand? Perhaps they've recently launched a promotional period, or expanded their product range? Or maybe a new business has joined your market with plans to disrupt the sector? Assessing your competition's state of play can help you identify gaps in your supply and introduce new initiatives to help drives sales and revenue.

- **Calendar events** – Over the course of a 12-month trading period, there are a handful of events that cause a peak in demand. Historic sales data can confirm when to anticipate these seasonal uplifts, giving you the opportunity to plan ahead and bolster your supply accordingly.

- **Seasonal changes** – Seasonal variations can have a huge impact on demand for certain products and services, so factor this into your supply chain management strategy. Season, weather, and amount of daylight can each drive or lower demand for specific products, so be sure to account for these general factors as part of your forecast.

Aggregate planning in supply chain management:

Aggregate planning, a fundamental decision model in supply chain management, refers to the determination of production, inventory, capacity and labor usage levels in the medium term

What is meant by aggregate planning?

Aggregate planning is **a method for developing an overall manufacturing plan that ensures uninterrupted production at a facility**. Aggregate production planning typically is applied to a 3- to 18-month period.

Why aggregate planning is important in supply chain?

Why is aggregate planning important? Aggregate planning is vital to a business' ability to schedule production, allocate resources, and adjust staffing. It **allows businesses to minimize costs and keep production running consistently**.

What are the features of aggregate planning?

Aggregate planning is the process of developing, analyzing, and maintaining a preliminary, approximate schedule of the overall operations of an organization. The aggregate plan generally contains **targeted sales forecasts, production levels, inventory levels, and customer backlogs**.

Aggregate Planning in Supply Chain Management :

Aggregate planning in supply chain management include the following:

- **Solid Demand Forecast** - It is important to anticipate demand for your product before you can plan your supply ordering. Using historical data as well as industry trends and forecast, you are able to accurately predict demand for your products for upcoming months. Your forecast will tell you how much you need to product in order to meet demand in order for you to know that quantity of supplies you will need to maintain productivity.

- **Production Capacity** - The ability to produce depends on machinery, work staff and efficiency. You are able to evaluate your production department to accurately determine how many products you can reasonably produce during the period that you are planning for. This could end up being less than demand. Utilizing your production ability to set goals for producing products that are realistic. Allow for personnel shortages and machinery maintenance.

- **Limitations on Capital** - No matter what quantity of supplies you would like to order, you need to take your cash into account. You may be limited by what you can afford. If you plan to borrow to buy supplies, include the interest costs in your estimates of the profits you will make from the products you manufacture. In short, make sure you have the capital to purchase the supplies you need.

What's the Purpose of Aggregate Planning?

As stated, the goal of aggregate planning is figuring out the level of production, inventory and workforce required to respond to fluctuating demand in the medium term. With this information, a business can assess when demand will spike or wane, and ensure it has enough product to meet the moment. Aggregate production planning also lets manufacturers know what staff, materials, output rates, timeline estimates and budget costs they need.

Making forecasts saves the company from changing its production schedule quickly, which is not only expensive but also creates insecurity and uncertainty. With aggregate planning, you can make a fairly accurate forecast of demand and capacity in the medium term.

Resource Management

In other words, you're working on short-term resource allocation. This reduces the risk of overproduction, which wastes resources, depresses prices and can lead to oversaturation of your

product in the market. By reducing production during periods of weak demand, you save money on labor and materials.

Cost Savings

Aggregate planning helps companies achieve their financial goals and improve the bottom line. It allows for maximum utilization of the available production capabilities while meeting customer demand and reducing their wait time, as well as reducing the cost of stocking excess inventory.

Good Data is Required

Aggregate planning forecasting is not a magic bullet, though. It's only as good as the data you collect (and the people you use) to forecast. People have biases, and they can misread economic indicators or use faulty forecast models. There are always unknowns, too, such as material price spikes, implementation of new policies, changing interest rates. Not to mention labor; alterations in labor conditions can cause unrest in your workforce.

Importance of Aggregate Planning

Aggregate planning plays an important part in achieving long-term objectives of the organization. Aggregate planning helps in:

- Achieving financial goals by reducing overall variable cost and improving the bottom line
- Maximum utilization of the available production facility
- Provide customer delight by matching demand and reducing wait time for customers
- Reduce investment in inventory stocking
- Able to meet scheduling goals there by creating a happy and satisfied work force

Factors Affecting Aggregate Planning

Aggregate planning is an operational activity critical to the organization as it looks to balance long-term strategic planning with short term production success. Following factors are critical before an aggregate planning process can actually start;

- A complete information is required about available production facility and raw materials.
- A solid demand forecast covering the medium-range period
- Financial planning surrounding the production cost which includes raw material, labor, inventory planning, etc.
- Organization policy around labor management, quality management, etc.

For aggregate planning to be a success, following inputs are required;

- An aggregate demand forecast for the relevant period
- Evaluation of all the available means to manage capacity planning like sub-contracting, outsourcing, etc.
- Existing operational status of workforce (number, skill set, etc.), inventory level and production efficiency

Aggregate planning will ensure that organization can plan for workforce level, inventory level and production rate in line with its strategic goal and objective.