



SUPPLY CHAIN MANAGEMENT (534E5B) – COURSE MATERIAL

VISION & MISSION STATEMENT

Vision: To be an oasis of knowledge to the seeker, to nurture one's creativity and research acumen, and to instill a unique blend of leadership, innovative spirit, and empathy in response to the ever-evolving business ecosystem.

Mission:

- Provide a pedagogy that blends academic rigor and experiential learning.
- Inculcate an entrepreneurial mindset through curated activities.
- Establish a conducive environment for research.
- Foster a culture of innovation and collaboration to progress in a dynamic business landscape.
- Promote humanistic values to produce socially responsible leaders.

Program Educational Objectives (PEOs)

PEO 1 – Employability:

To develop students with industry-specific knowledge & skills to meet the industry requirements, and also join a public sector undertaking through competitive examinations.

PEO 2 – Entrepreneur:

To create effective business service owners with a growth mindset by enhancing their critical thinking, problem-solving, and decision-making skills

PEO3 – Research and Development:



To instil and grow a mindset that focuses efforts towards inculcating and encouraging the students in the field of research and development

PEO 4 – Contribution to Business World

To produce ethical and innovative business professionals to enhance the growth of the business world **PEO 5 – Contribution to the Society:**

To work and contribute towards the holistic development of society by producing competent MBA professionals

Program Outcomes

PO1: Problem Solving Skill

Application of tools & techniques relevant to management theories and practices in analysing & solving business problems

PO2: Decision-Making Skill

Fostering analytical and critical thinking abilities for data-based decision making

PO3: Ethical Value

Ability to develop value-based leadership attributes

PO4: Communication Skill

Ability to understand, analyse, and effectively communicate global, economic, legal, and ethical aspects of business

PO5: Individual and Team Leadership Skill

Ability to be self-motivated in leading & driving a team towards the achievement of organizational goals and contributing effectively to establish industrial harmony

PO6: Employability Skill



Foster and enhance employability skills through relevant industry subject

knowledge **PO7: Entrepreneurial Skill**

Equipped with skills and competencies to become a global entrepreneur

PO8: Contribution to Society

Strive towards becoming a global influencer and motivating future generations towards building a legacy that contributes to the overall growth of humankind

SYLLABUS

1. Introduction to Supply Chain: Historical perspective Understanding Supply Chain key issues in supply chain management Objectives, importance, Decision phases -Examples of supply chains Supply chain strategies, The supply chain becomes value chain Supply chain as a competitive weapon

2. Supply chain synergies: Collaborate with supply chain partners Supply Chain Drivers and Design Drivers of supply chain performance: Framework for structuring Facilities, including warehouse, Inventory, Transportation, Information, Sourcing, and Pricing – Yield management /Revenue management

3. Sales and Operations Planning: Demand management Demand forecasting, Aggregate Planning and Managing Supply, Demand and Inventory Aggregate Planning in a Supply Chain: role, aggregate planning problems, strategies, role of IT, Implementation Responding to predictable variability in supply chain – Types of supply chains-creating responsive supply chains lean and agile supply chain their characteristics.

4. Leadership and Control:

Customer value and supply chain management: Dimensions of customer value-value added services – customer value measures Push-pull boundary –mass customization and supply chain management outsource - Third and Fourth - Party Logistics providers – managing risk in supply chains Creating a sustainable supply chain.

5. Supply chain analytics: Use of computer software in supply chain problems -Electronic commerce – emerging mega trends supply chain of the future –seeking structural flexibility–The multi-channel revolution 2020 vision.

Unit 1: Introduction to Supply Chain:

Definition of Supply Chain Management (SCM) :The Council of Supply Chain Management Professionals defines supply chain management as follows: “Supply chain management encompasses the planning and



management of all activities involved in sourcing and procurement, conversion, and all logistics management activities”.

Career in supply chain management/logistics

- Supply Chain Analyst:
- Procurement Specialist:
- Logistics Coordinator:
- Inventory Analyst:
- Operations Assistant:
- Warehouse Coordinator:
- Production Planner:
- Customer Service Representative:

History of SCM in Modern Business

- Pallet and pallet lifts mechanization was the research focus of logistics circa 1940 and 1950 to obtain better warehousing space, racking and layout.
- The “unit load” concept and pallet use became popular, extending to transportation management in 1950 by utilizing intermodal containers together with ships, trains, and trucks to transport them.
- Time-sensitive freight transportation steered toward trucking rather than railroad as a trend in the 1960s.
- “Physical Distribution” became a joint need (warehousing, material handling, and freight transportation).
- The late 1970s and early 1980s, this led to the creation at Georgia Tech of the Production and Distribution Research Center, the Material Handling Research Center, and the Computational Optimization Center. Each center focused on different aspects of what could be done with computing technologies.
- During the 1980s, personal computing began a logistics transformation with marked improvements in supply chain management.
- With access to computers, planning surged ahead with unprecedented graphical interfaces.
- An emergence of new technology like flexible spreadsheets and map-based interfaces significantly improved logistics planning and execution technology.



The Technological Revolution in Supply Chain Management

- In the 1990s, Enterprise Resource Planning (ERP) systems were created during the logistics boom and after the successes of the 1970s and 1980s Material Requirements Planning systems.
- Globalization and Supply Chains
- Globalized manufacturing such as the growth of manufacturing in China in the mid 1990s popularized the term “supply chain”. China’s exports to the U.S. went from \$45 billion per year in 1995 to over \$280 billion per year by 2006. The sheer complexity of global networks spotlighted how critical logistics strategies now coined ‘supply chain management’ were for successful strategic issues and logistics for corporate tactical and operational issues.
- 2000s — As the supply chain became more complex, a distinction occurred between two important concepts. "Logistics" was defined as a supply chain process and "supply chain management" was defined as the strategic coordination of business functions within the company and with outside entities.
- Specialization era (phase II): supply-chain management as a service

Supply chain management Definitions

- A supply chain is a global network used to deliver products and services from raw materials to end customer through information flow, physical distribution and cash.
- Supply chain involved all the stages directly or indirectly in fulfilling a customer request which includes manufacturers, suppliers, transporters, warehouses, retailers and customers. It is the integration of demand and supply.

Key issues in supply chain management

1. Material scarcity
2. Costing
3. Usage of multiple channels to market
4. Exposure to risk
5. Maintaining Quality and sustainability
6. Shortage of qualified personnel
7. Quality customer service
8. Lack of end to end visibility
9. Implementation of technology
10. Inability to forecast demand
11. Supply chain fragmentation
12. Changing customer attitude

Objectives of SCM

- To maximize overall value generated



- To meet consumer demand for guaranteed delivery of high quality and low cost with minimal lead time
 - To fulfill customer demand through efficient resources
 - To maximize efficiency of distribution side
 - Helps in better decision
- Improves Customer Services

Importance of SCM

- Customers expect to receive the correct product mix and quantity to be delivered on time
- Products need to be on hand in the right location
- Follow up support after a sale must be done quickly
- Reduce Operating Costs
- Decreases Purchasing Cost
- Decrease Production Cost
- Decrease Total Supply Chain Cost
- Improves Financial Position

Function of SCM

- Customer Relationship Management: Consistent focus on end customer demands to meet the increasing customer requirements and ensures a high degree of flexibility.
- Flexibility and demand-oriented production: Continuous cost reduction and resource optimization across all stages of the value chain.
- Synchronization of supply and demand: Increasing the adaptability and development capability of the supply chain

Decision phases

Successful supply chain management requires many decisions relating to the flow of information, product, and funds. These decisions fall into three categories or phases, depending on the frequency of each decision and the time frame over which a decision phase has an impact. The design, planning, and operation of a supply chain have a strong impact on overall profitability and success.

i. Supply chain strategy or design

- During this phase, the supply chain is structured and configured.
- It is designed that, how resources will be allocated, and what processes each stage will perform.
- Strategic decisions made by companies include:
- location and capacities of production and warehouse facilities
- products to be manufactured or stored at various locations
- modes of transportation to be made available along different shipping legs
- type of information system to be utilized, Supply chain design decisions are typically made for the long term

Supply chain planning



- During this phase, the time frame considered is a quarter to a year. It starts with a forecast of demand in the coming year.
- As a result, the supply chain's configuration determined in the strategic phase is fixed. The configuration establishes constraints within which planning must be done. Planning establishes parameters within which a supply chain will function over a specified period of time. Companies start the planning phase with a forecast for the coming year of demand in different markets.
- Planning decisions include those regarding markets to which a given production facility will supply and target production quantities at different locations.
- The companies must include uncertainty in demand, exchange rates, and competition over this time horizon in their decisions.

iii. Supply chain operation

- The time horizon is weekly or daily, and during this phase companies make decisions regarding individual customer orders.
- At the operational level, supply chain configuration is considered fixed and planning policies are already defined.
- The goal of supply chain operations is to handle incoming customer orders in the best possible manner. During this phase, the following activities are undertaken:
 - firms allocate inventory or production to individual orders

Each cycle occurs at the interface between two successive stages:

- Customer order cycle (customer- retailer)
- Replenishment cycle (retailer- distributor)
- Manufacturing cycle (distributor- manufacturer)
- procurement cycle (manufacturer- supplier)

Supply chain strategies

The following qualities and attributes are key to building and executing an effective supply chain strategy:

Collaborative: All key stakeholders should participate and share plans and data so everyone is well-informed, plans are synchronized, and disruption and risk are mitigated.

Agile: New opportunities arise every day. A supply chain strategy must scale up or down to respond to changing market demands so opportunities are not missed and so productivity is not wasted.

Resilient: In an ever-changing market, organizations must be prepared for any and all disruptions. Supply chains must expect problems, create plans to avoid or mitigate them, and recover from them to full functionality as swiftly as possible.

Digital: A variety of digital solutions can help make your supply chain more connected, controlled and informed. For example, modern enterprise resource planning (ERP) tools orchestrate all supply chain activities and offer real-time information about processes, machine status, inventory and more.



Value chain Perspective

Michael E. Porter, of Harvard Business School, introduced the concept of a value chain in his book "Competitive Advantage: Creating and Sustaining Superior Performance" (Free Press, 1998). "Competitive advantage cannot be understood by looking at a firm as a whole," Porter wrote. "It stems from the many discrete activities a firm performs in designing, producing, marketing, delivering, and supporting its product."

Value Chain

- How does your organization create value?
- How do you change business inputs into business outputs in such a way that they have a greater value than the original cost of creating those outputs?
- This isn't just a dry question: it's a matter of fundamental importance to companies, because it addresses the economic logic of why the organization exists in the first place.

Value Chain

- The value that's created and captured by a company is the profit margin:
- Value Created and Captured – Cost of Creating that Value = Margin
- The more value an organization creates, the more profitable it is likely to be. And when you provide more value to your customers, you build competitive advantage.

A value chain is a set of activities that an organization carries out to create value for its customers

Porters Value chain Perspective

Primary Activities

- Primary activities relate directly to the physical creation, sale, maintenance and support of a product or service. They consist of the following:
- Inbound logistics. These are all the processes related to receiving, storing, and distributing inputs internally. Your supplier relationships are a key factor in creating value here.
- Operations. These are the transformation activities that change inputs into outputs that are sold to customers. Here, your operational systems create value.
- Outbound logistics. These activities deliver your product or service to your customer. These are things like collection, storage, and distribution systems, and they may be internal or external to your organization.
- Marketing and sales. These are the processes you use to persuade clients to purchase from you instead of your competitors. The benefits you offer, and how well you communicate them, are sources of value here.
- Service. These are the activities related to maintaining the value of your product or service to your customers, once it's been purchased.

Support Activities

- Procurement (purchasing). This is what the organization does to get the resources it needs to operate. This includes finding vendors and negotiating the best prices.



- Human resource management. This is how well a company recruits, hires, trains, motivates, rewards, and retains its workers. People are a significant source of value, so businesses can create a clear advantage with good HR practices.
- Technological development. These activities relate to managing and processing information, as well as protecting a company's knowledge base. Minimizing information technology costs, staying current with technological advances, and maintaining technical excellence are sources of value creation.
- Infrastructure. These are a company's support systems, and the functions that allow it to maintain daily operations. Accounting, legal, administrative, and general management are examples of necessary infrastructure that businesses can use to their advantage.
- Companies use these primary and support activities as "building blocks" to create a valuable product or service.

Supply chain as a competitive weapon

- Your supply chain's primary function is to take your products from creation to delivery, but it can also provide you a competitive advantage within your industry and with your customers.
- From start to finish, your supply chain offers opportunities to spearhead innovation, maximize organizational savings, boost company profits, and positively impact your customers' experience with your brand.

Utilize Supply Chain Technology that Adds Value

Enable supply chain automation through robotics: Industry giants like Amazon are using robotics to automate the supply chain, cutting overhead from operations and labor. Amazon "employs" more than 750,000 robots
<https://www.youtube.com/watch?v=Ox05Bks2Q3s>

2. Leverage smart supply chains: Organizations can capitalize on big data sets mined from machines tagged with sensors to move supply chain planning from reactive to proactive.

Applying advanced analytics enables organizations to find and predict issues before they occur, instead of detecting and responding to issues after it's too late.

3. Automate orders: Errors are less likely to occur in automated processes that aren't subject to human delays or errors and automating routine orders can help to avoid financial loss in the form of over- or under-stocking a retailer. For example, P&G leverages a standardized data warehouse that automates commerce between suppliers and retailers.

- Employ artificial intelligence (AI): AI applications can tackle customer service payment processing, IT support, or operations, eliminating overhead costs. P&G is also embracing this application in its payment processing.

- Enable Agile Process Improvement for Supply Chain Advantages

- <https://www.youtube.com/watch?v=hOh6h1zMKLI>

- Maximize Supply Chain Partnerships and Relationships



- Cultivate Team Innovation and Technology

Unit 2: Supply chain synergies:

Supply chain synergies refer to the benefits and efficiencies gained when different parts of the supply chain work together more effectively than they would independently. These synergies can lead to cost savings, improved service levels, enhanced innovation, and competitive advantage. Below are the key areas where supply chain synergies can be realized:

1. Cost Synergies

- **Economies of Scale:** Combining procurement activities across different divisions or companies can lead to bulk purchasing, reducing per-unit costs.
- **Shared Resources:** Pooling resources like warehousing, transportation, and technology can lower operational costs.
- **Process Optimization:** Streamlining processes across the supply chain reduces waste, minimizes redundancy, and cuts costs.

2. Operational Synergies

- **Integrated Planning:** Collaborative planning between suppliers, manufacturers, and distributors can lead to better demand forecasting, production scheduling, and inventory management, reducing lead times and improving service levels.
- **Inventory Management:** Coordinating inventory levels across the supply chain ensures that stock is available where it's needed while minimizing excess inventory and associated costs.

3. Logistical Synergies

- **Consolidated Transportation:** Combining shipments from multiple suppliers or customers into fewer, fuller loads can reduce transportation costs and carbon footprint.
- **Shared Distribution Centers:** Using common distribution centers or cross-docking facilities to serve multiple parts of the supply chain can lead to faster delivery times and lower warehousing costs.
- **Network Optimization:** Optimizing the overall supply chain network design (e.g., location of plants, warehouses, and distribution centers) can improve service levels while minimizing costs.

- ### 4. Innovation Synergies
- **Collaborative Product Development:** Engaging suppliers early in the product development process can lead to innovations in materials, processes, and designs that reduce costs or improve product quality.
 - **Joint R&D Initiatives:** Collaborative research and development efforts across the supply chain can lead to faster innovation cycles and shared knowledge, resulting in better products and services.
 - **Technology Sharing:** Sharing technological advancements, such as automation or AI-driven analytics, across the supply chain can accelerate innovation and operational efficiency.

The competitive strategy defines the set of customer needs which a firm seeks to satisfy through its products



and services. It includes low cost, rapid response, product differentiation etc.

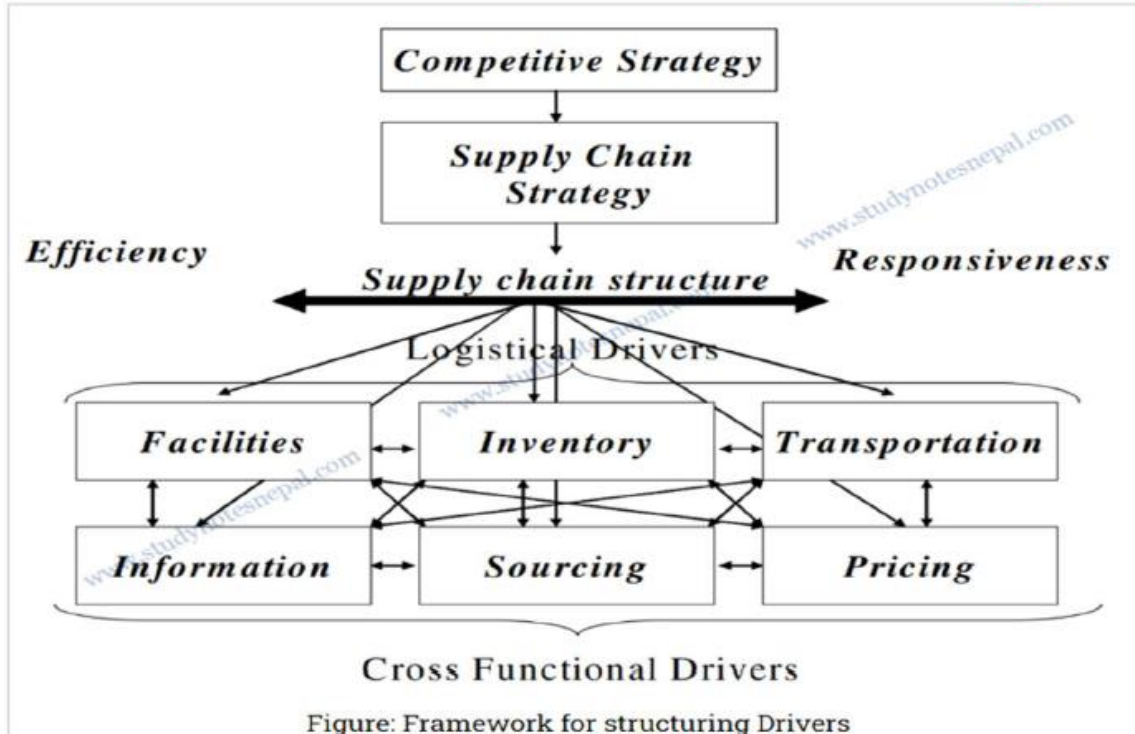
- Supply chain strategy determines the nature of material procurement, transportation of materials, and manufacture of product or creation of service, distribution of product.
- Consistency and support between supply chain strategy, competitive strategy, and other functional strategies is important

Supply chain drivers

Supply Chain Drivers	Responsiveness	Efficiency
1. Production	<ul style="list-style-type: none">- Excess capacity- Flexible manufacturing- Many smaller plants	<ul style="list-style-type: none">- Little excess capacity- Narrow focus- Few central plants
2. Inventory	<ul style="list-style-type: none">- High inventory levels- Wide range of items	<ul style="list-style-type: none">- Low inventory levels- Fewer items
3. Location	<ul style="list-style-type: none">- Many locations close to customers	<ul style="list-style-type: none">- Few central locations serve wide areas
4. Transportation	<ul style="list-style-type: none">- Frequent shipments- Fast & Flexible modes	<ul style="list-style-type: none">- Few large shipments- Slower and cheaper modes
5. Information	<ul style="list-style-type: none">- Collect & share timely and accurate data	<ul style="list-style-type: none">- Cost of information drops while other costs rise



Framework for structuring drivers





Facility Related Metrics

A manager should track the following facility-related metrics that influence supply chain performance:

- **Capacity:** measures the maximum amount a facility can process.
- **Utilization:** measures the fraction of capacity that is currently being used in the facility. Utilization affects both the unit cost and associated delays.
- **Production cost per unit:** measures the average cost to produce a unit of output.
- **Theoretical flow/cycle time of production:** measures the time required to process a unit if there are absolutely no delays at any stage.
- **Actual average flow/cycle time:** measures the average time taken for all units processed over a specified duration such as week or month.
- **Flow time efficiency:** is the ratio of the theoretical flow time to the average flow time.
- **Product variety:** measures the number of products processed in a facility.
- **Volume contribution of top 20 percent SKUs and customers:** measures the fraction of total volume processed by a facility that comes from the top 20 percent SKUs or customers.

Metrics of Inventory

A manager should track the following inventory-related metrics that influence supply chain performance:

- **Average inventory:** measures the average amount of inventory carried.
- **Products with more than a specified number of days of inventory:** identifies the products for which the firm is carrying high level of inventory.
- **Average replenishment batch size:** measures the average amount in each replenishment order.
- **Average safety inventory:** measures the average amount of inventory on hand when a replenishment order arrives.
- **Seasonal inventory:** measures the amount of both cycle and safety inventory that is purchased solely due to seasonal changes in demand.
- **Fill rate: (order/case)** measures the fraction of orders/ demand that were met on time from inventory.
- **Fraction of time out of stock:** measures the fraction of time that a particular SKU had zero inventories.

Revenue management, also known as yield management, is a crucial strategy in supply chain management that



focuses on maximizing revenue by optimizing the allocation of resources and pricing strategies. Here's how it typically works and its role in the supply chain:

Key Concepts:

1. Dynamic Pricing:

1. Adjusting prices based on demand, supply conditions, and other factors. For instance, airlines and hotels often use dynamic pricing to adjust their rates based on booking patterns, time of purchase, and seasonality.

2. Demand Forecasting:

1. Predicting future demand using historical data, market trends, and other analytics. Accurate forecasting helps in setting optimal prices and managing inventory levels.

3. Inventory Management:

1. Balancing inventory levels to avoid both excess and stockouts. Effective inventory management ensures that resources are allocated where they can generate the most revenue.

4. Segmentation:

1. Dividing customers into different segments based on their willingness to pay or their purchasing behavior. This allows for targeted pricing strategies and promotions.

5. Capacity Management:

1. Ensuring that production and supply capabilities align with demand forecasts. This involves adjusting production schedules, managing lead times, and optimizing resource utilization

Unit 3: Sales and Operations Planning (S&OP)

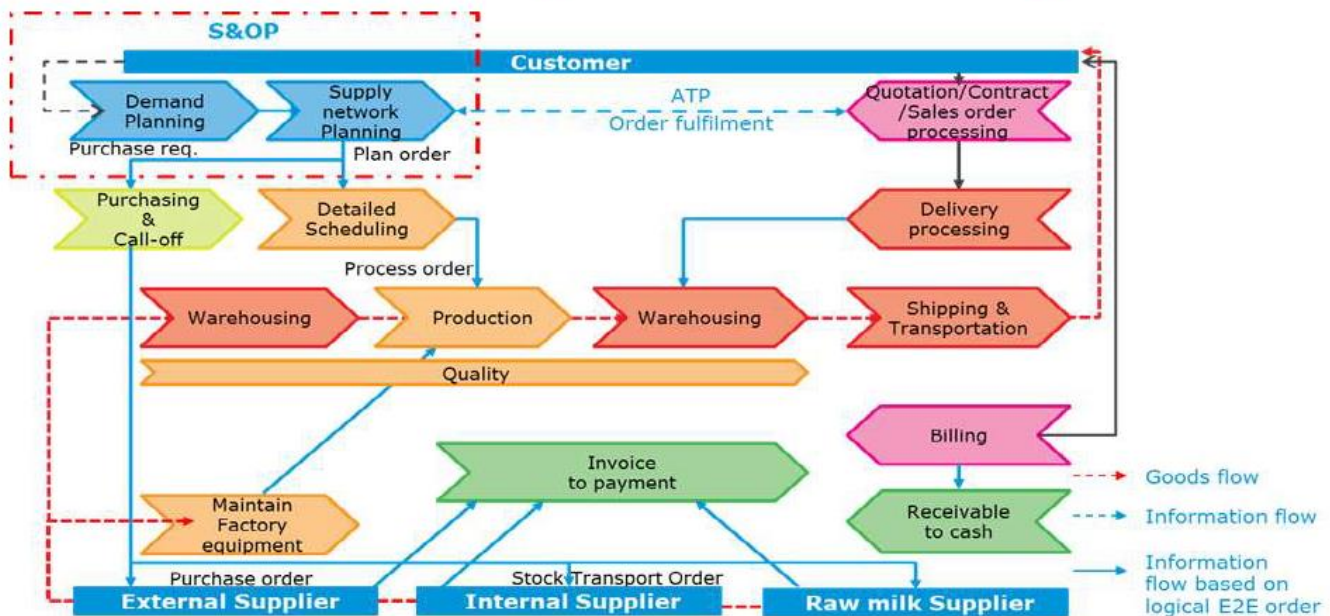
Sales and Operations Planning (S&OP) is a critical process in supply chain management that helps organizations balance supply and demand, align their operational plans with business goals, and enhance overall efficiency.

Here's a detailed look at S&OP and its role in supply chain management

S&OP is an integrated approach to managing supply and demand that involves aligning sales forecasts with production, procurement, and other operational plans. The goal is to ensure that supply chain activities are synchronized with market demand, leading to improved customer service, reduced costs, and optimized resource utilization.



Sales and Operations Planning



Demand management is a method for planning and forecasting demand for your products.

- At its core, demand management creates better relationships between your operations and marketing teams. It also expands capacity to meet customers' needs and adapt to changes in demand.

- The most effective demand chain management strategy considers both marketing and supply chain management (SCM) strategies.

- This way, retailers can analyze demand from several angles. For instance, trends and buying patterns, current (and future) production capacity, and other market competitors

Demand forecasting is the process of predicting what customers' appetite will be for existing products or services, determining what adjustment you should make and what new offerings will spark interest. But predicting what people will want, in what quantities and when is no small feat. For example, timelines can be very specific, "Should we ship more chips on Friday than Thursday?" Or they can span a period of time, such as "between now and a month from now" or "over the course of the next calendar year."

Aggregate Planning in supply chain management within a manufacturing facility is extremely important when attempting to boost operational efficiency within the operation.

- When you attempt to look months ahead to determine your supply chain needs, you can use the techniques of aggregate planning.

- This approach enables you to have a comprehensive view of the supplies you will need in order to meet demand for your products. Through ordering for the entire planning period, you can qualify for bulk discounts and ultimately avoid shortages



- 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.

Lean

Lean supply chain management is all about reducing costs and waste. This method is focused on efficient, streamlined operation. Typically, the supplier has one point of contact across the entire company and one contract governing their relationship. They offer the same price to all a company's locations.

In a lean approach, anything in the process that doesn't add value for customers is eliminated. When implementing a lean supply chain, you're constantly looking for ways to remove layers of waste and only take steps that add value to a product or service.

Lean strategies rely on forecasting to predict how much inventory will be needed to meet demand. In some lean supply chains, products are made on an as-needed basis so there's no unnecessary overproduction. The lean approach is best in markets that don't vary a whole lot. Functional and necessary items like toiletries fit in this category.

Agile supply chain management prioritizes adaptability. It's for organizations that want to quickly adapt to changing situations. This method makes it easier to adjust sourcing, logistics, and sales in response to factors including economic swings, technology changes, and customer demand.

Typically, an agile supply system waits to see what the market demand is before finishing production. Short-term forecasts help companies stay responsive, but a key aspect of agile supply chains is that they respond to demand as it happens. This approach is useful when producing fast-changing and customizable items like fashion wear.

An agile supply chain typically results in short order lead times. It's also quick to respond to customers. And when something unexpected happens, such as a regular supplier not being able to fill an order, the system enables flexibility. You can also respond more quickly to new market opportunities with an agile supply chain.



Unit 4: Leadership and Control- value chain:

Value chain is essential to product-led growth. Having a clear idea of how your solution adds value to your customers' lives is the only way you'll be able to clearly communicate the core benefits and get your value proposition across.

- The customer value chain is a combination of what your customers need, how they use your product, and the ways in which you can make it easier for them to use the product.
- Value chains differ from supply chains because the former focuses on increasing the amount of value a product provides, while the latter centres around the development and delivery process.

Why Value Chain matters

1. Customer-centric businesses. While there's merit to both product-centric and customer-centric business models, it's impossible to fully capitalize on the customer-centric business model if you don't have a welldefined customer value chain.
2. Customer pain points. Insights into customer needs and customer pain points will guide your technology development while helping you refine your marketing strategies — offering a cost advantage over your competitors who'll need to spend more on broad advertising campaigns.
3. Decision-making. It's a lot easier to make good decisions when you understand the needs of your existing customers, understand how most satisfied customers use your product, and go into all business processes with the goal of making it easier to use the product.
4. Competitive advantage. An in-depth comprehension of what new customers (and current customers) are looking for in your product will help you build a more appealing brand with a differentiation advantage that will give your company a competitive edge over other solutions on the market

Push System

- using demand projection
- production decisions are based on long-term forecasts
- much longer to react to the market
- the inability to meet changing demand patterns
- the obsolescence of supply chain inventory as demand for certain products disappears
- inefficient resource utilization
- excessive inventories (large safety stocks)
- larger & more variable production batches
- unacceptable service levels
- product obsolescence
- increase in variability (bullwhip effect)
- production or transportation capacity is based on peak or average demand
- increased transportation costs, high inventory levels and/or high manufacturing costs



Pull System

Using actual demand

- production is demand driven - coordinated with true customer demand, not a forecast
- firms respond to specific orders
- fast information flow mechanisms

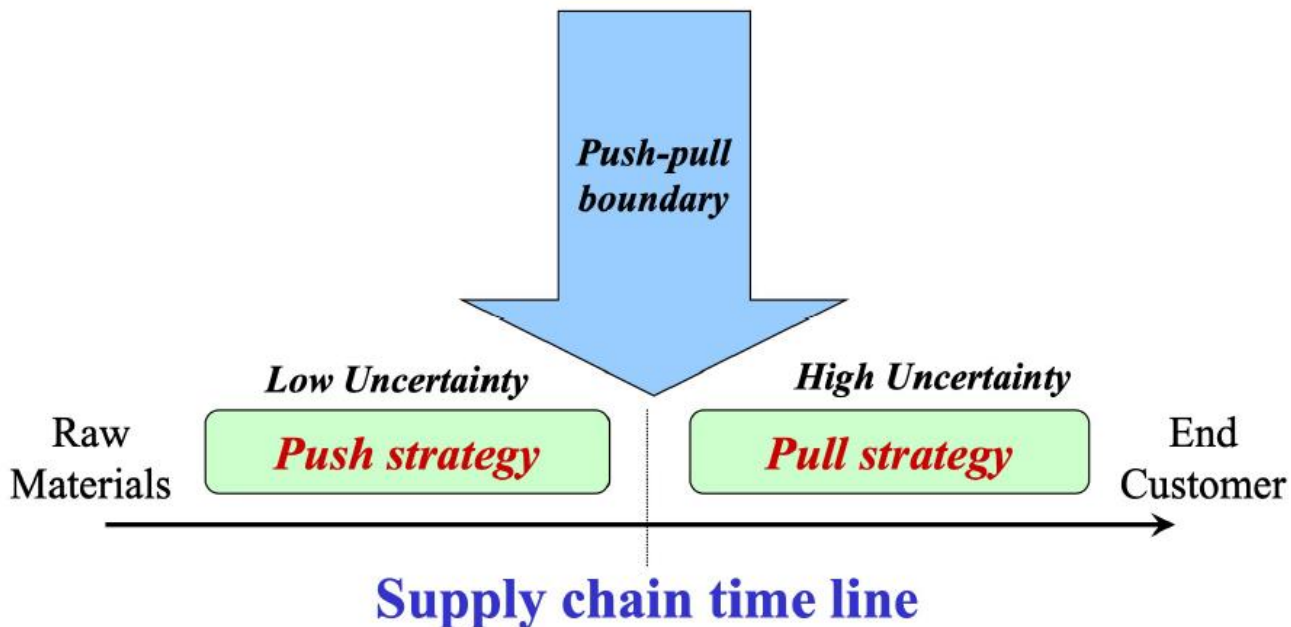
advantages

- decrease in lead times
- ability to better anticipate incoming orders from the retailers
- decreased inventory at the manufacturer due to the reduction in variability
- decrease in inventory (retailers) - inventory levels increase with lead times
- decrease in variability in the system and variability faced by manufacturers due to lead time reduction
- better response to changing markets

disadvantages

- difficult to implement when lead times are so long that it is impractical to react to demand information
- more difficulty to take advantage of Economics of Scale (EOS) in manufacturing & transportation

Push and pull boundary



Managing risks in SCM

- Supply chain risk management (SCRM) is the process of finding and addressing potential vulnerabilities in a company's supply chain. SCRM aims to minimize the impact of these risks on a company's operations,



reputation and financial performance.

- Supply chain management is essential to business operations. But amid globalization, supply chains have become increasingly complex and interconnected. Companies rely on a vast ecosystem of suppliers, manufacturers, distributors and logistics professionals to deliver goods and services to customers around the world.

- Implementing a supply chain risk management strategy is a way for companies to build the resilience to navigate uncertainty and ensure business continuity. With proactive preparedness, companies can avoid or minimize disruptions, reduce costs, improve quality and enhance customer satisfaction. SCRM also helps companies comply with regulations, protect their brand reputation and foster sustainability.

Risks that affect in SCM operations

- Internal and external supply chain risks can come from various sources, including natural disasters, geopolitical events, supplier bankruptcy, quality issues and cyberattacks.

Global events

Natural disasters such as earthquakes, hurricanes or floods can upend supply chains. So can political and economic developments, including war and geopolitical instability, trade disputes, strikes

Supplier risk

Healthy supply chains rely on healthy supplier partnerships. Weaknesses in a provider's financial stability, capacity constraints or other issues could create instability. If a supplier's reliability is in question, companies that rely on it may decide to diversify their sources or investigate backup options to ensure a steady flow of materials or components.

Cybersecurity threats

Digital systems and communication technologies are often employed to manage orders, inventory and distribution, leaving supply chains increasingly vulnerable to cyberattacks. Ransomware attacks and malware can halt production, delay distribution and prove costly. Breaches of sensitive supply chain data can expose proprietary information or customer data, leading to reputational damage and legal consequences.

Creating a sustainable Supply chain

A sustainable supply chain is the result of a holistic application of environmental, social, economic, and legal concerns to the entire supply chain.

In creating a sustainable supply chain, a supply chain manager will consider factors such as:

- waste
- carbon emissions and carbon footprints
- labour conditions
- health and safety
- worker exploitation



Unit 5: Supply chain analytics:

Supply chain analytics is the process of using data to gain insights into the supply chain and improve its performance:

Data collection: Data is collected from various sources within the supply chain, including suppliers, manufacturers, distributors, retailers, and customers.

Data analysis: The data is analyzed to identify patterns, trends, and opportunities for improvement.

Data visualization: The data is visualized in the form of graphs, charts, and other means.

Decision making: Data-driven decisions are made to improve the supply chain

Supply chain analytics can help organizations:

- Improve efficiency: Reduce costs and enhance efficiency
- Mitigate risks: Identify and evaluate risks that may impact the supply chain, such as transportation bottlenecks and geopolitical uncertainties
- Improve customer satisfaction: Improve the quality, delivery, and customer experience of products
- Forecast demand: Use predictive analytics to forecast demand and anticipate potential bottlenecks
- Maintain optimal stock levels: Use predictive analytics to forecast and replenish inventory

Types of Supply Chain Analytics

Descriptive
Analytics

Diagnostic
Analytics

Predictive
Analytics

Prescriptive
Analytics

Cognitive
Analytics

What happened? ▶

Why it happened? ▶

What will happen? ▶

What should I do? ▶



Emerging Trends in Supply Chain Management

