

Module - 3

Supply Chain Management

Introduction to Supply Chain Concepts, significance and key challenges. Scope of SCM-historical perspective, essential features, Drivers of SCM, decision phases–process view, supply chain frame work, key issues in SCM and benefits. Managing uncertainty in Supply Chain, (Bullwhip Effect), Impact of uncertainties, forecasting in Supply Chain, Innovations in Supply Chain. Sourcing Decisions in Global SCM, Key issues in Global sourcing, Outsourcing. Network design in the supply chain, factors affecting the network design decisions.

Introduction to Supply Chain Concepts:

Successful integration or coordination of these three flows produces improved efficiency and effectiveness for business organizations. In theory, supply chains can work as cohesive, singularly competitive units similar to a large, vertically integrated firm, without significant financial investments by the members of the chain. The basic difference between vertically integrated firms and a supply chain is that firms in a supply chain are relatively free to enter and leave supply chain relationships if these relationships are no longer proving beneficial. This poses challenges; supply chains are often very dynamic or fluid, partners can change, each partner will look out for its long term advantage, and this can also cause problems in effectively managing supply chains. While supply chain management may allow organizations to realize the advantages of vertical integration, certain conditions must be present for successful supply chain management to occur. It also creates competition amongst supply chains and supply chain partners, therefore, supply chains can operate more effectively than many vertically integrated conglomerates.



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Supply Chain Concept:

What Is a Supply Chain?

A supply chain is a network between a company and its suppliers to produce and distribute a specific product to the final buyer. This network includes different activities, people, entities, information, and resources. The supply chain also represents the steps it takes to get the product or service from its original state to the customer.

Supply chain refers to the system of organizations, people, activities, information, and resources involved in the movement of goods or services from the supplier to the end consumer. It encompasses all the stages and processes involved in the production, distribution, and delivery of products or services.

(A supply chain is a network between a company and its suppliers to produce and distribute a specific product or service)

or

A supply chain is an entire system of producing and delivering a product or service, from the very beginning stage of sourcing the raw materials to the final delivery of the product or service to end users. The supply chain lays out all aspects of the production process, including the activities involved at each stage, information that is being communicated, natural resources that are transformed into useful materials, human resources, and other components that go into the finished product or service.

Supply Chain Management can be defined as the management of flow of products and services, which begins from the origin of products and ends at the product's consumption. It also comprises movement and storage of raw materials that are involved in work in progress, inventory and fully furnished goods.

Example: For a simple product like soap, the HUL supply chain involves ingredient suppliers, transporters, the company's manufacturing plants, carrying & forwarding agents, wholesalers, distributors and retailers.



According to Handfield and Nichols “SCM is the integration of all activities associated with the flow and transformation of goods from raw materials through to end user, as well as information flows, through improved supply chain relationships, to achieve a sustainable competitive advantage”.

Significance and Key Challenges of Supply Chain Management:

Supply chain management (SCM) plays a significant role in the success and competitiveness of businesses across various industries. It involves the coordination and integration of activities involved in sourcing, procurement, production, logistics, and distribution to ensure the timely delivery of products or services to customers. Here are the significance and key challenges of supply chain management:

Significance of Supply Chain Management:

1. **Cost Efficiency:** Effective supply chain management can help organizations achieve cost efficiencies by optimizing inventory levels, streamlining processes, reducing waste, and minimizing transportation and warehousing costs. It enables organizations to identify areas of improvement, eliminate inefficiencies, and enhance overall operational performance.
2. **Customer Satisfaction:** SCM focuses on meeting customer demands and expectations by ensuring timely delivery, product availability, and responsiveness. By effectively managing the supply chain, organizations can improve customer service, enhance order

fulfillment, and build strong customer relationships, leading to increased customer satisfaction and loyalty.

3. **Competitive Advantage:** A well-managed supply chain can be a source of competitive advantage. It enables organizations to respond quickly to market changes, adapt to customer needs, and deliver products or services efficiently. Organizations with a strong supply chain can differentiate themselves by offering better quality, faster delivery, and superior customer service compared to their competitors.
4. **Collaboration and Integration:** SCM involves collaboration and integration among various stakeholders in the supply chain, including suppliers, manufacturers, distributors, and customers. Effective collaboration enhances communication, information sharing, and coordination, resulting in improved efficiency, reduced lead times, and better overall supply chain performance.
5. **Risk Management:** Supply chain management helps organizations identify and mitigate risks throughout the supply chain. By proactively managing risks related to disruptions, such as natural disasters, supplier failures, or market volatility, organizations can minimize the impact on their operations, maintain continuity, and ensure business resilience.

Key Challenges of Supply Chain Management:

1. **Demand Forecasting and Planning:** Accurately forecasting demand and planning inventory levels are critical challenges in supply chain management. Inaccurate demand

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forecasts can lead to stock outs or excessive inventory, negatively impacting customer satisfaction and financial performance.

2. **Supply Chain Visibility:** Gaining end-to-end visibility across the supply chain is a challenge, especially when dealing with multiple suppliers, manufacturing sites, and distribution channels. Lack of visibility can lead to inefficiencies, delays, and difficulties in managing inventory, demand, and logistics effectively.
3. **Globalization and Complex Networks:** With the increasing globalization of supply chains, managing complex networks of suppliers, vendors, and partners across different regions and cultures becomes more challenging. Language barriers, cultural differences, varying regulations, and long-distance logistics can create complexities in supply chain management.
4. **Supply Chain Disruptions:** Disruptions such as natural disasters, political instability,

supplier failures, or global crises (e.g., COVID-19 pandemic) can significantly impact supply chain operations. Managing and mitigating the impact of such disruptions require robust risk management strategies and contingency plans.

5. **Technological Advancements:** While technology can greatly enhance supply chain management, keeping pace with rapidly evolving technologies can be a challenge. Adopting and integrating new technologies such as automation, artificial intelligence, data analytics, and block chain requires investment, expertise, and change management.
6. **Sustainability and Ethical Practices:** Increasingly, organizations are under pressure to ensure sustainable and ethical practices throughout their supply chains. Balancing economic, environmental, and social factors, such as reducing carbon footprint, ensuring responsible sourcing, and promoting fair labor practices, can be complex and challenging.

Scope of Supply Chain Management:

The scope of supply chain management (SCM) encompasses the end-to-end coordination and integration of activities involved in the flow of products, services, information, and finances from the sourcing of raw materials to the delivery of the final product or service to the end customer. It involves managing the entire network of suppliers, manufacturers, distributors, retailers, and customers to ensure the smooth and efficient functioning of the supply chain. The scope of SCM includes the following areas:

1. Procurement and Sourcing: This involves identifying, evaluating, and selecting suppliers, negotiating contracts, managing relationships with suppliers, and ensuring the timely and cost effective sourcing of raw materials, components, or services.

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2. Inventory Management: This includes optimizing inventory levels to meet customer demand while minimizing carrying costs and stock outs. It involves forecasting demand, managing safety stock, implementing inventory control systems, and monitoring inventory levels throughout the supply chain.

3. Production and Operations Management: This involves managing the production processes, capacity planning, scheduling, quality control, and continuous improvement initiatives to ensure efficient and effective production of goods or delivery of services.

4. Logistics and Transportation: This includes managing the movement of goods, materials, and information across the supply chain. It involves selecting transportation modes, managing transportation networks, optimizing routes, coordinating with carriers, and tracking shipments to

ensure timely and cost-effective delivery.

5. Warehousing and Distribution: This encompasses the management of storage facilities, distribution centres, and fulfilment operations. It involves optimizing warehouse layout, inventory storage, order picking, packing, and shipping to facilitate efficient product flow and order fulfilment.

6. Demand Planning and Forecasting: This involves analysing historical data, market trends, and customer insights to forecast future demand. It includes demand planning, sales and operations planning (S&OP), and collaborative forecasting to align supply with demand and optimize resource allocation.

7. Information Systems and Technology: This encompasses the use of information systems, technologies, and digital platforms to support supply chain operations. It includes enterprise resource planning (ERP) systems, supply chain management software, data analytics, internet of things (IoT), and block chain to improve visibility, collaboration, and decision-making.

8. Sustainability and Corporate Social Responsibility: This focuses on integrating sustainability and ethical practices into supply chain operations. It involves responsible sourcing, environmental management, social compliance, ethical labour practices, and corporate social responsibility initiatives throughout the supply chain.

9. Risk Management: This encompasses identifying, assessing, and mitigating risks that could disrupt supply chain operations. It involves developing risk management strategies, implementing contingency plans, and ensuring business continuity in the face of supply chain disruptions.

10. Collaboration and Relationship Management: This involves building strong relationships and collaboration among supply chain partners. It includes supplier relationship management, customer relationship management, and fostering collaboration, trust, and information sharing across the supply chain.

Historical Perspective:

Following the Second World War, production outstripped demand, resulting in more marketing or selling problems than buying problems.

Also, the World War emphasized the importance of reaching the right products at the right time in the right amount and of the right quality. If the soldiers could not get whatever they wanted at the right time, the consequences could be disastrous. If the enemy was right in front and the soldier started firing at him from his pistol, and if due to quality problems the pistol did not work at that

instant, the less said about the outcome, the better. These requirements and the criticalities associated with them made the defence forces seriously analyse the supply system.

The supply system includes the process of planning, implementing and controlling the efficient, effective flow and storage of goods or services from the organisation from its place of production to the place where it is required.

HISTORY

The history of supply chain management (SCM) spans several decades and has evolved in response to various economic, technological, and business trends. Here is a more detailed timeline of the history of SCM:

1960s-1970s:

- Material Requirements Planning (MRP): In the 1960s, Joseph Orlicky introduced MRP, a computer-based system that enabled manufacturers to plan and control the flow of materials required for production. MRP focused on optimizing inventory levels, managing bill of materials, and synchronizing production schedules.

1980s:

- Just-in-Time (JIT): The JIT philosophy, pioneered by Japanese manufacturers like Toyota, gained prominence in the 1980s. Just-in-time, or JIT, is an inventory management method in which goods are received from suppliers only as they are needed. JIT emphasized reducing waste, minimizing inventory, and achieving smooth production flow by synchronizing processes across the supply chain. Close collaboration with suppliers was essential to JIT implementation.

1990s:

- Supply Chain Management Emergence: In the 1990s, SCM emerged as a strategic discipline aimed at integrating and optimizing the entire supply chain. The term "supply chain management" gained recognition, and organizations began focusing on end-to-end coordination, information sharing, and collaboration to enhance overall supply chain performance.

2000s:

- Supply Chain Integration: The 2000s saw a greater emphasis on supply chain integration, enabled by advancements in information technology. Enterprise Resource Planning (ERP) systems and other software solutions facilitated real-time visibility, data sharing, and process integration across supply chain partners.

2010s:

- Sustainability and Risk Management: Growing concerns about environmental sustainability and supply chain disruptions prompted organizations to incorporate sustainability practices and risk management strategies into their supply chain operations. This included assessing and mitigating risks, ensuring ethical sourcing, and adopting environmentally friendly practices.
- Digital Transformation: The rise of digital technologies, such as the Internet of Things (IoT), big data analytics, artificial intelligence (AI), and blockchain, brought about a new wave of supply chain innovation. These technologies provided enhanced visibility, predictive capabilities, automation, and traceability, enabling organizations to optimize their supply chain operations further.

2020s:

- Resilient Supply Chains: The COVID-19 pandemic highlighted the importance of supply chain resilience. Organizations began reevaluating their supply chain strategies to build resilience, reduce dependencies, diversify sourcing, and enhance agility to withstand future disruptions.
- E-commerce and Omni channel: The growth of e-commerce and changing customer expectations led to the rise of Omni channel supply chains. Organizations needed to adapt their supply chain networks and capabilities to fulfil orders across multiple channels, including online platforms, physical stores, and direct-to-customer shipments.

It's important to note that the evolution of SCM continues, driven by ongoing technological advancements, changing consumer demands, sustainability imperatives, and geopolitical factors. Supply chain management remains a critical discipline for organizations seeking to optimize their operations, drive efficiency, and deliver value to customers in an increasingly complex and interconnected global marketplace.

Essential Features of SCM:

The essential features of supply chain management (SCM) encompass various aspects that contribute to its effectiveness and success. These features are crucial for achieving efficient and coordinated flow of products, services, and information across the supply chain. Here are the essential features of supply chain management:

1. Integration: SCM emphasizes the integration and coordination of activities across the entire supply chain, including suppliers, manufacturers, distributors, retailers, and customers. Integration ensures seamless communication, collaboration, and alignment of processes, goals,

and strategies among all stakeholders.

2. Visibility: Supply chain visibility involves having real-time and accurate information about inventory, demand, and logistics throughout the supply chain. It enables better decision-making, improved forecasting, proactive risk management, and enhanced responsiveness to changes in customer demand or market conditions.

3. Collaboration: Collaboration is a fundamental aspect of SCM, promoting trust, cooperation, and information sharing among supply chain partners. Effective collaboration facilitates better demand forecasting, inventory planning, order fulfilment, and joint problem-solving, leading to improved operational efficiency and customer satisfaction.

4. Demand-driven approach: SCM emphasizes a demand-driven approach, where supply chain activities are aligned with actual customer demand rather than relying solely on forecasts. It involves closely monitoring customer demand, using real-time data, and adopting agile and flexible strategies to quickly respond to changing market dynamics.

5. Efficient inventory management: Effective inventory management is crucial in SCM to strike a balance between meeting customer demand and minimizing inventory carrying costs. It involves optimizing inventory levels, implementing just-in-time (JIT) or lean principles, employing demand-driven replenishment strategies, and leveraging technology to track and manage inventory in real time.

6. Logistics optimization: SCM focuses on optimizing logistics and transportation operations to ensure efficient movement of goods across the supply chain. This includes selecting the most cost effective transportation modes, optimizing routes, consolidating shipments, and leveraging technology to track and manage shipments in transit.

7. Continuous improvement: SCM emphasizes a culture of continuous improvement and innovation. It involves regularly evaluating supply chain performance, identifying areas for improvement, implementing best practices, and embracing new technologies and process enhancements to enhance efficiency, reduce costs, and improve customer satisfaction.

8. Risk management: Supply chain risk management involves identifying and mitigating risks that can disrupt supply chain operations. It includes assessing vulnerabilities, developing risk mitigation strategies, implementing contingency plans, and building resilience to potential disruptions such as natural disasters, supplier failures, or geopolitical events.

9. Sustainability and ethical practices: SCM incorporates sustainable and ethical practices into supply chain operations. It involves responsible sourcing, environmental stewardship, social compliance, fair labour practices, and ethical business conduct throughout the supply chain.

10. Performance measurement and analytics: SCM utilizes performance measurement metrics and analytics to monitor and evaluate supply chain performance. Key performance indicators (KPIs) such as on-time delivery, order accuracy, inventory turnover, and supply chain costs are tracked and analysed to identify areas for improvement, make data-driven decisions, and drive overall supply chain efficiency.

Drivers of Supply Chain Management:

The major drivers of supply chain performance consist of three logistical drivers & three cross functional drivers.

Logistical Drivers:

- **Facilities**
- **Inventory**
- **Transportation**

Cross-Functional Drivers:

- **Information**
- **Sourcing**
- **Pricing**

Company's supply chain achieves the balance between responsiveness & efficiency that best meets the needs of the company competitive strategy.

A) Inventory:

Inventory encompasses all the raw materials, work in process, and finished goods within a supply chain. Changing inventory policies can dramatically alter the supply chain's efficiency & responsiveness.

There are three basic decisions to make regarding the creation and holding of inventory:

- **Cycle Inventory:** This is the amount of inventory needed to satisfy demand for the product in the period between purchases of the product.
- **Safety Inventory:** Inventory that is held as a buffer against uncertainty. If demand forecasting could be done with perfect accuracy, then the only inventory that would be needed would be cycle inventory.
- **Seasonal Inventory:** This is inventory that is built up in anticipation of predictable increases in demand that occur at certain times of the year.

B) Transportation:

Transportation entails moving inventory from point to point in the supply chain. Transportation can take the form of many combinations of modes & routes, each with its own performance characteristics. There are six basic modes of transport that an accompany can choose from;

Road Transport:

- *Description:* Involves the use of vehicles such as trucks, vans, and automobiles for transporting goods on roads.
- *Advantages:* Flexibility, door-to-door service, and the ability to reach remote areas.
- *Considerations:* Limited capacity, potential for traffic delays.

Rail Transport:

- *Description:* Utilizes trains to move goods along railway tracks.
- *Advantages:* Cost-effective for long distances, large capacity, lower fuel consumption.
- *Considerations:* Limited accessibility to specific locations, fixed infrastructure.

Water Transport:

- *Description:* Includes shipping goods via ships, boats, or barges on rivers, seas, or oceans.
- *Advantages:* Cost-effective for large shipments, suitable for bulky or heavy goods.
- *Considerations:* Longer transit times, limited accessibility to inland locations.

Air Transport:

- *Description:* Involves the use of airplanes to transport goods quickly over long distances.
- *Advantages:* High speed, global reach, suitable for time-sensitive goods.
- *Considerations:* Higher costs, limited capacity for large or heavy cargo.

Pipeline Transport:

- *Description:* Uses pipelines to transport liquids, gases, or even solids in some cases.
- *Advantages:* Cost-effective for certain materials, continuous flow.
- *Considerations:* Limited to specific types of cargo, requires infrastructure.

Intermodal Transport:

- *Description:* Combines multiple modes of transport, such as using trucks, trains, and ships in a coordinated manner.
- *Advantages:* Increased flexibility, optimized routes, and reduced transit times.
- *Considerations:* Requires effective coordination, may involve multiple carriers.

C) Facility:

Facility are the actual physical locations in the supply chain network where product is stored, assembled or fabricated. The two major types of facilities are:

- Production sites (factories)

- Storage sites (warehouses)

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Factories can be built to accommodate one of two approaches to manufacturing: · **Product**

Focus: A factory that takes a product focus performs the range of different operations required to make a given product line from fabrication of different products parts to assembly of these parts.

- **Functional Focus:** A functional focus approach concentrates on performing just a few operations such as only making a select group of parts or doing only assembly.

D) Information:

Information serves as the connection between various stages of a supply chain, allowing them to coordinate & maximize total supply chain profitability. It is also crucial to the daily operations of each stage in a supply chain for e.g. a production scheduling system.

Information is used for the following purpose in a supply chain;

- Coordinating daily activities related to the functioning of other supply chain drivers: facility, inventory & transportation.
- Forecasting & planning to anticipate & meet future demands. Available information is used to make tactical forecasts to guide the setting of monthly & quarterly production schedules & time table.
- Enabling technologies: many technologies exist to share & analyse information in supply chain. Managers must decide which technologies to use & how to integrate these technologies into their companies like internet, ERP, RFID.

E) Sourcing:

Sourcing is the set of business processes required to purchase goods & services. Managers must first decide which tasks will be outsourced & those that will be performed within the firm.

Components of sourcing decisions:

- **In-House or outcome:** The most significant sourcing decision for a firm is whether to perform a task in-house or outsource it to a third party. This decision should be driven in part by its impact on the total supply chain profitability.
- **Supplier Selection:** It must be decided on the number of suppliers they will have for a particular activity. They must then identify criteria along which suppliers will be evaluated & how they will be selected like through direct negotiations or resort to an auction.

F) Pricing:

Pricing determines how much a firm will charge for goods & services that it makes available in

the supply chain. Pricing affects the behaviour of the buyer of the good or services, thus affecting supply chain performance.

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- **Fixed Price versus Menu Pricing:** A firm must decide whether it will charge a fixed price for its supply chain activities or have a menu with price that vary with some other attribute, such as response time or location of delivery.

SCM – Decision Phases

Decision phases can be defined as the different stages involved in supply chain management for taking an action or decision related to some product or services. Successful supply chain management requires decisions on the flow of information, product, and funds that fall into three decision phases. Here we will be discussing the three main decision phases involved in the entire process of supply chain. The three phases are described below:

Supply Chain Strategy – Strategic level

In this phase, decision is taken by the management mostly. The decision to be made considers the sections like **long term prediction and involves price of goods** that are very expensive if it goes wrong. It is very important to study the market conditions at this stage.

These decisions consider the prevailing and future conditions of the market. They comprise the structural layout of supply chain. After the layout is prepared, the tasks and duties of each is laid out.

All the strategic decisions are taken by the higher authority or the senior management. These decisions include deciding manufacturing the material, factory location, which should be easy for transporters to load material and to dispatch at their mentioned location, location of warehouses for storage of completed product or goods and many more.

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Supply Chain Planning – Tactical level

Supply chain planning should be done according to the demand and supply view. In order to understand customers' demands, market research should be done. The second thing to consider is awareness and updated information about the competitors and strategies used by them to satisfy their customer demands and requirements. As we know, different markets have different demands and should be dealt with a different approach.

This phase includes it all, starting from predicting the market demand to which market will be provided the finished goods to which plant is planned in this stage. All the participants or employees involved with the company should make efforts to make the entire process as flexible as they can. A supply chain design phase is considered successful if it performs well in short-term planning.

Supply chain framework, key issues in SCM and benefits. Definition and scope of Logistics. Elements of Logistics, types, incremental value delivery through Logistics management. Innovations in Supply Chain. Estimating customer demand, forecasting in Supply Chain.

Supply Chain Operations – Operational level

The third and last decision phase consists of the various functional decisions that are to be made instantly within minutes, hours or days. The objective behind this decisional phase is minimizing uncertainty and performance optimization. Starting from handling the customer order to supplying the customer with that product, everything is included in this phase.

For example, imagine a customer demanding an item manufactured by your company. Initially, **the marketing department is responsible for taking the order and forwarding it to production department and inventory department.** The production department then responds to the customer demand by sending the demanded item to the warehouse through a proper medium and the distributor sends it to the customer within a time frame. All the departments engaged in this process need to work with an aim of improving the performance and minimizing uncertainty.

- Inventory allocation to orders
- Pick list of warehouses
- Shipping mode

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Process View of SCM

[h=ttps://www.youtube.com/watch?v=Fm2Lqhyf89o](https://www.youtube.com/watch?v=Fm2Lqhyf89o)

SCM Framework Model

"SCM Framework" could refer to different concepts depending on the context. Generally, SCM stands for Supply Chain Management, which is the management of the flow of goods, services, information, and finances across a network of interconnected organizations, from the point of origin to the point of consumption.

This framework focuses on five areas of the supply chain: plan, source, make, deliver, and return. These areas repeat again and again along the supply chain. The supply chain council says this process spans from “the supplier's supplier to the customer's customer

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Plan: Demand, supply planning and management are included in this first step. Elements include balancing resources with requirements and determining communication along the entire chain. The plan also includes determining business rules to improve and measure supply chain efficiency. These business rules span inventory, transportation, assets, and regulatory compliance, among others. The plan also aligns the supply chain plan with the financial plan of the company.

Source: This step describes sourcing infrastructure and material acquisition. It describes how to manage inventory, the supplier network, supplier agreements, and supplier performance. It discusses how to handle supplier payments and when to receive, verify, and transfer product.

Make: Manufacturing and production are the emphasis of this step. Is the manufacturing process make- to-order, make-to-stock, or engineer-to-order? The make step includes, production activities, packaging, staging product, and releasing. It also includes managing the production network, equipment and facilities, and transportation

Deliver: Delivery includes order management, warehousing, and transportation. It also includes receiving orders from customers and invoicing them once product has been received. This step involves management of finished inventories, assets, transportation, product life cycles, and importing and exporting requirements

Return: Companies must be prepared to handle the return of containers, packaging, or defective product. The return involves the management of business rules, return inventory, assets, transportation, and regulatory requirements

Monitor and Control: Throughout the entire supply chain process, continuous monitoring and

control are essential. This involves tracking performance, identifying issues, and making adjustments to ensure the supply chain operates efficiently and effectively.

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Collaboration and Communication: Effective communication and collaboration between various stakeholders in the supply chain, such as suppliers, manufacturers, distributors, and retailers, are crucial for success.

Technology Integration: Modern supply chains heavily rely on technology for data management, analytics, automation, and optimization. Integrating technology solutions can enhance visibility and decision-making.

Sustainability and Risk Management: In today's business environment, supply chain sustainability and risk management have become increasingly important. Organizations need to consider environmental, social, and ethical factors while also preparing for potential disruptions.

Continuous Improvement: Regularly assessing and improving the supply chain process is essential to adapt to changing market conditions, customer demands, and technological advancements.

Key Components of Supply Chain Management

Framework Plan:

Demand Planning: Forecasting customer demand to ensure that the right amount of products or services will be available when needed.

Supply Planning: Planning for the procurement of raw materials, production schedules, and distribution.

Source:

Supplier Management: Identifying, selecting, and managing suppliers to ensure a reliable and cost-effective supply of raw materials or components.

Procurement: The process of acquiring the necessary goods and services from suppliers.

Make:

Manufacturing/Production: Transforming raw materials into finished goods through various production processes.

Quality Control: Ensuring the quality of products at various stages of production.

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Deliver:

Logistics and Distribution: Managing the transportation and distribution of finished goods to distribution centers, retailers, or end customers.

Order Fulfillment: Processing customer orders efficiently and accurately.

Return:

Reverse Logistics: Managing the return of defective or unsold products, recycling, or disposal.

Key Issues in SCM

- **Globalization presents several critical supply chain management challenges to enterprises and organizations:**

First, to reduce costs across the supply chain, enterprises are moving manufacturing operations to countries which offer lower labor costs, lower taxes, and/or lower costs of transport for raw materials. For some companies, outsourcing production involves not only a single country, but several countries for different parts of their products.

- **Quality and Compliance** Aside from influencing consumer behavior, social media highlights the importance of having high-quality products. Reading reviews, comments, and feedback is the top social media activity that influences online shopping behavior. Thus, enterprises are under increasing pressure to create high-quality products and to create them consistently. They can do so by addressing quality at every level of the supply chain, such as raw materials procurement, manufacturing, packaging, logistics, and product handling.

- **Like globalization, the fast-changing consumer market also brings with it supply chain management challenges:** First, products have shorter life cycles due to rapidly changing market demands. Enterprises are under pressure to keep up with the latest trends and innovate by

introducing new products, while keeping their total manufacturing costs low because they understand that trends will not last for a long time. This also demands a flexible supply chain that can be utilized for manufacturing other products and for future projects.

- **Post Covid Situation** has drastically changed the way the world is functioning. SCM has grown exponentially and has also weakened its strength in various ways. Food and Hotel industry through Swiggy and Zomato has found its growth but, tourism collapsed, leading to changes in supply and demand chain.

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Benefits of SCM:

1. Vertically Integrated Partnerships:

- **Coordination and Collaboration:** Vertically integrated partnerships involve collaboration between different stages of the supply chain. This coordination enhances communication, reduces lead times, and improves overall efficiency.
- **Risk Mitigation:** By working closely with suppliers and other partners, organizations can better understand and manage risks throughout the supply chain, ensuring a more resilient and responsive network.

2. Procurement:

- **Cost Savings:** Efficient procurement practices help in negotiating better prices, optimizing supplier relationships, and reducing overall costs.
- **Quality Assurance:** Close collaboration with suppliers ensures the quality and reliability of inputs, reducing the risk of defects and disruptions in the production process.

3. Inventory Control:

- **Cost Reduction:** Effective inventory control helps in minimizing holding costs and reduces the risk of obsolete or excess inventory.
- **Improved Cash Flow:** Optimized inventory levels contribute to better cash flow management, as excess capital is not tied up in excessive stockpiles.

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4. Logistics:

- **Enhanced Efficiency:** Streamlined logistics processes result in faster and more cost-effective movement of goods from suppliers to consumers.
- **Customer Satisfaction:** Timely and reliable deliveries contribute to higher customer satisfaction and loyalty.

5. Product Lifecycle Management:

- **Innovation:** Efficient product lifecycle management allows for quicker development and introduction of new products, fostering innovation.
- **Cost Control:** Understanding the entire product lifecycle helps in managing costs effectively at each stage, from design to disposal.

6. Preferential Pricing & Lead-Times:

- **Competitive Advantage:** Negotiating preferential pricing and lead times with suppliers can provide a competitive edge by offering better value to customers.
- **Responsive Operations:** Shorter lead times enable faster response to changes in market demand, reducing the risk of stock outs and excess inventory.

7. Demand Management:

- **Improved Forecasting:** Accurate demand management facilitates better forecasting, reducing the likelihood of stock outs or overstock situations.
- **Customer Satisfaction:** Meeting customer demand promptly enhances customer satisfaction and loyalty.

The key benefits of supply chain management are as follows:

- Develops better customer relationship and service.
- Creates better delivery mechanisms for products and services in demand with minimum delay.
- Improves productivity and business functions.
- Minimizes warehouse and transportation costs.
- Minimizes direct and indirect costs.
- Assists in achieving shipping of right products to the right place at the right time.
- Enhances inventory management, supporting the successful execution of just-in-time stock models.
- Assists companies in adapting to the challenges of globalization, economic

- upheaval, expanding consumer expectations, and related differences.
- Assists companies in minimizing waste, driving out costs, and achieving efficiencies throughout the supply chain process.

Managing Uncertainties in Supply Chain:

Managing uncertainty in the supply chain is crucial for organizations to adapt to dynamic and unpredictable conditions. Uncertainty can arise from various sources, such as market demand fluctuations, geopolitical events, natural disasters, supplier issues, and technological changes. Here are some strategies to effectively manage uncertainty in the supply chain:

Demand Forecasting:

Use advanced analytics and forecasting models to predict demand more accurately. Implement collaborative forecasting with key partners to share information and insights.

Diversification of Suppliers:

Identify and qualify alternative suppliers to reduce dependency on a single source. Develop strong relationships with multiple suppliers to enhance flexibility.

Inventory Management:

Maintain strategic safety stock levels to buffer against demand variability or supply disruptions. Implement just-in-time (JIT) inventory practices to minimize excess inventory costs.

Risk Management:

Conduct thorough risk assessments to identify potential disruptions and their impacts. Develop risk mitigation plans and prioritize them based on potential severity.

Technology Integration:

Utilize advanced technologies such as Internet of Things, block chain, and AI to enhance visibility and traceability in the supply chain. Implement real-time monitoring systems to identify issues early and respond promptly.

Flexibility in Operations:

Design supply chain processes with built-in flexibility to adapt to changing conditions. Have contingency plans in place for alternative routes, modes of transportation, and manufacturing

locations.

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Continuous Improvement:

Implement a continuous improvement mindset to regularly evaluate and enhance supply chain processes.

Encourage feedback from all stakeholders to identify areas for improvement.

Collaboration and Communication:

Foster strong communication channels with suppliers, customers, and other stakeholders. Establish a collaborative network to share information, insights, and risks.

Scenario Planning:

Develop and regularly update scenario plans to anticipate and prepare for different possible futures.

Conduct tabletop exercises to test the effectiveness of response plans.

Supplier Relationship Management:

Foster strong relationships with key suppliers, including open communication and regular performance reviews.

Collaborate with suppliers to implement joint risk mitigation strategies.

Employee Training and Development:

Train employees on how to handle unexpected disruptions and crises.

Cross-train employees to ensure flexibility in resource allocation during disruptions.

The Bullwhip Effect

The bullwhip effect is a supply chain phenomenon describing how small fluctuations in demand at the retail level can cause progressively larger fluctuations in demand at the wholesale, distributor, manufacturer and raw material supplier levels. The effect is named after the physics involved in cracking a whip. When the person holding the whip snaps their wrist, the relatively small movement causes the whip's wave patterns to increasingly amplify in a chain reaction.

In supply chain management, customers, suppliers, manufacturers and salespeople all have only partial understanding of demand and direct control over only part of the supply chain, but each influences the entire chain with their forecasting inaccuracies (ordering too much or too little). A

change in any link along the supply chain can have a profound effect on the rest of the supply chain. Given that, there are many contributors and causes of the bullwhip effect in supply chain management.

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A simplified example of the bullwhip effect

The bullwhip effect often occurs when retailers become highly reactive to demand, and in turn, amplify expectations around it, which causes a domino effect along the supply chain. Suppose, for example, a retailer typically keeps 100 six-packs of one soda brand in stock. If it normally sells 20 six-packs a day, it would order that replacement amount from the distributor. But one day, the retailer sells 70 six-packs and assumes customers will start buying more product, and responds by ordering 100 six-packs to meet this higher forecasted demand.

The distributor may then respond by ordering double, or 200 six-packs, from the manufacturer to ensure they do not run out. The manufacturer then produces 250 six-packs to be on the safe side. In the end, the increased demand has been amplified up the supply chain from 100 six-packs at the customer level to 250 at the manufacturer.

This example is highly simplified but conveys the sense of exponentially increasing misalignment as actions and reactions continue up and down the chain. The bullwhip effect also occurs as a result of lowered demand at the customer level (which causes shortages when inaccurate) and can be caused at other places along the chain.

A rise in uncertainty is widely believed to have detrimental effects on macroeconomic, microeconomic, and financial market outcomes and induce responses from monetary, fiscal, and regulatory policymakers,” they wrote.

Theoretical models suggest that rising uncertainty can affect economic activity and decision making in various ways, the authors explained. In particular, they noted:

- Firms may delay investment and hiring.
- Households may reduce spending by increasing their saving rates if they anticipate possible changes in their income or wealth.
- Financing costs may rise if risk premiums increase.

Impact of uncertainties

Most researchers find that uncertainty shocks—or unexpected increases in uncertainty—reduce

economic activity, raise unemployment and reduce inflation for several months after the shock, the authors pointed out.

In their own analysis, which was based on a 2018 working paper they wrote, the authors examined how uncertainty shocks affect variables such as consumer spending on durable goods and businesses' investment in equipment and other fixed assets.

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For their uncertainty measure, they used the Index of Economic Policy Uncertainty (EPU) developed by Scott Baker, Nicholas Bloom and Steven Davis. Jackson, Kliesen and Owyang identified and studied shocks that pushed the EPU above the largest value it had reached over the previous four quarters.

After uncertainty shocks, contractions in investment and consumption contribute substantially to slower growth of real GDP, the authors said.

“In particular, business fixed investment and durables consumption exhibit deep, persistent contractions in growth in uncertain environments,” they wrote.

“Our findings thus support the view that firms and households delay expenditure when faced with spikes in uncertainty,” they concluded. “On the bright side, we also find evidence that monetary policy can help mitigate the adverse effects of uncertainty shocks.”

Impact of uncertainties, forecasting in Supply Chain.

Uncertainties in the supply chain can have a significant impact on the overall efficiency and performance of a business. Supply chain activities involve various interconnected processes, from procurement and production to distribution and delivery. Uncertainties can arise from various sources, including market demand fluctuations, geopolitical events, natural disasters, supplier issues, and changes in regulations. Forecasting plays a crucial role in mitigating the impact of uncertainties in the supply chain. Here are some key points to consider:

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Inventory Management: Uncertainties in demand and supply can lead to challenges in maintaining optimal inventory levels. Forecasting helps in predicting future demand, enabling organizations to adjust their inventory levels accordingly and prevent excess or insufficient stock.

Production Planning: Fluctuations in demand or unexpected disruptions can affect production schedules. Accurate forecasting allows organizations to plan their production activities more effectively, optimizing resources and minimizing the risk of overproduction or stock outs.

Supplier Relationships: Supply chain uncertainties may result in disruptions in the flow of materials from suppliers. Forecasting helps in anticipating potential issues and building stronger relationships with key suppliers. Collaborative forecasting and communication can enable better responsiveness to changes in the supply chain.

Cost Management: Uncertainties can impact costs related to inventory holding, expedited shipping, and production adjustments. Effective forecasting helps in managing costs by aligning resources with expected demand, reducing the need for expensive last-minute adjustments.

Customer Service: Fluctuations in supply chain performance can affect customer satisfaction. Accurate forecasting enables organizations to meet customer demand more reliably, enhancing overall customer service and loyalty.

Risk Mitigation: Forecasting is a proactive approach to risk management. By identifying potential uncertainties and developing contingency plans, organizations can better prepare for disruptions, reducing the impact on the supply chain.

Technology Integration: Advanced technologies, such as artificial intelligence and machine learning, can enhance forecasting accuracy by analyzing large datasets and identifying patterns. Integrating these technologies into supply chain management systems can improve the overall resilience of the supply chain.

Agility and Flexibility: Forecasting allows organizations to build more agile and flexible supply chains. Being able to adapt quickly to changes in demand or disruptions in the supply chain is crucial for maintaining competitiveness in dynamic markets.

Data Visibility: Effective forecasting relies on accurate and timely data. Improving data visibility across the supply chain helps in creating more precise forecasts and better decision-making.

What is Demand Forecasting in the Supply Chain

Demand forecasting in supply chain management refers to the process of planning or predicting the demand of materials to ensure you can deliver the right products and in the right quantities to satisfy customer demand without creating a surplus. Forecast error can result in creating a surplus, which is both wasteful and costly.

Demand Forecasting/Estimating Techniques

Within the sphere of qualitative and quantitative forecasting, there are several different methods you can use to predict demand:

- **Collective Opinion**, which leverages the knowledge and experience of a company's sales team to aggregate historical data on customer demand.
- **Customer Survey Method**, which provide key information on customer expectations, desires, and needs. This data is useful for creating a sales forecast but is harder to predict actual demand.
- **The Barometric Method**, which involves using economic indicators to predict trends and measure current, past and future activity.
- **The Expert Opinion Method**, which involves soliciting expert advice from external contractors to determine future activity.
- **The Market Experiment Method**, which utilizes market experiments carried out under controlled conditions to inform retailers on consumer behaviour.
- **The Statistical Method**, which allows a company to identify and analyse the relationships between different variables; establish performance history over time, identify trends and extrapolate potential future trends.

How to Forecast / Estimating Demand

Demand forecasting is valuable to all businesses but is particularly useful to e-commerce brands and retailers, where accurate forecasting can support inventory management efforts and improve the customer experience.

- **Collect the Right Data**

For your demand forecast to be successful, you must ensure that you have the right kind of data to make informed business decisions. It's important to hone-in on the numbers that give you the information you need to make decisions, like pricing trends and how many people visited on your sales channels in a given timeframe.

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- **Adjust for Variables**

There are many factors that go into the daily interactions that affect sales data. For your demand forecast to be successful, you need to account for any variables that may sway your data one way or another, such as natural disasters or unexpected store closures. Another factor is if the product is seasonal or trendy, as intermittent demand or future demand can make it harder to create an accurate forecast.

- **Document Sales and Demand Trends**

Whichever metric you choose, you'll need a repeatable data analysis process that accurately depicts whether the forecast is getting better or worse; points to items that need the most improvement; measures accuracy at your procurement lead time and provides accurate information by customer, branch, brand, product and category.

- **Budget, Purchase, and Allocate Accordingly**

Once your demand forecast is in place, the only thing left to do is utilize your collected data to draw up a strategy for how, where and when to allocate your resources and purchasing efforts.

- **Flow space Makes Demand Forecasting Easy**

To effectively increase profits and mitigate unnecessary costs, you need to improve demand forecasting and optimize your supply chain.

Innovations in SCM

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8 innovations that are transforming supply chains

Here are eight additional innovations that are transforming supply chains:

- 1. Last-mile delivery:** Last-mile delivery solutions are revolutionizing the final leg of the supply chain, improving efficiency and customer satisfaction. Innovations such as delivery drones, autonomous vehicles, and crowdsourced delivery platforms are being explored to optimize last mile logistics and reduce delivery times.
- 2. Self-service/do-it-yourself logistics:** Self-service logistics platforms allow businesses to manage their own logistics processes, from booking transportation to tracking shipments. These platforms provide greater control, visibility, and flexibility, empowering businesses to handle their logistics needs independently.
- 3. On-demand warehousing:** On-demand warehousing services provide flexible storage solutions, allowing businesses to rent space as needed, instead of investing in dedicated warehouses. These services help optimize inventory management, reduce costs, and accommodate seasonal fluctuations in storage requirements.
- 4. Collaborative mobile robots:** Collaborative robots, or cobots, work alongside humans in warehouses and distribution centres, assisting with tasks such as picking, packing, and sorting. These robots enhance productivity, improve worker safety, and enable efficient handling of diverse products.
- 5. Truck platooning:** Truck platooning involves a group of trucks connected through technology, driving closely together in a convoy. Through vehicle-to-vehicle communication and automation, platooning reduces aerodynamic drag, improves fuel efficiency, and increases road capacity.
- 6. Block chain:** Block chain technology ensures secure and transparent transactions and data sharing across the supply chain. It enhances traceability, authentication, and compliance by creating an immutable record of transactions, reducing fraud, and improving supply chain visibility.
- 7. Tagging, sensors, and geolocation technologies:** These technologies enable real-time tracking and monitoring of products throughout the supply chain. RFID tags, IoT sensors, and geolocation technologies provide accurate and timely information about product location, temperature, and condition, facilitating inventory management and improving supply chain visibility.
- 8. Big data and AI:** Big data analytics combined with AI algorithms empower organizations to analyse vast amounts of data and extract valuable insights. These technologies enhance demand forecasting accuracy, optimize inventory management, enable predictive maintenance, and support data-driven decision-making across the supply chain.

By leveraging these innovations, organizations can achieve greater efficiency, agility, and competitiveness in their supply chain operations, ultimately delivering enhanced customer experiences and driving business growth.

Sourcing Decisions in Global SCM

Purchasing, also called procurement, is the process by which companies acquire raw materials, components, products, services, or other resources from suppliers to execute their operations. Sourcing is the entire set of business processes required to purchase goods and services. For any supply chain function, the most significant decision is whether to outsource the function or perform it in-house. Outsourcing results in the supply chain function being performed by a third party. Outsourcing decisions are important and tend to vary across firms and industries. For example, W.W. Grainger, an MRO distributor, has consistently owned and managed its distribution centers. In contrast, outbound transportation of packages from distribution centers to customers has consistently been outsourced to a third party. What factors can explain Grainger's decisions?

Until 2005, Dell was credited with improving profits by keeping the retail function in-house and selling directly to customers. Since 2007, however, Dell has started to outsource retailing to firms such as Walmart. Dell has also increased the fraction of assembly that it outsources to contract manufacturers. Why was vertical integration into retailing a good idea for Dell until about 2005 but not after 2007? Was Dell right in outsourcing a greater fraction of assembly to contract manufacturers? In contrast to Dell, Apple has significantly expanded the insourcing of retailing during the same period by growing Apple retail stores. Procter & Gamble (P&G) has never attempted to sell detergent directly to customers, and no one is calling on it to bring the retail

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function in-house. What made vertical integration into retailing a good idea for Apple but a bad idea for P&G? Most companies outsource assembly in consumer electronics. In contrast, most companies insource assembly in the automotive industry. What factors may explain this difference?

We address the outsourcing of supply chain activities by a firm based on the following three questions:

1. Will the third party increase the supply chain surplus relative to performing the activity in-house?
2. To what extent do risks grow upon outsourcing?

3.Are there strategic reasons to outsource?

Recall that the supply chain surplus is the difference between the value of a product for the customer and the total cost of all supply chain activities involved in bringing the product to the customer. Our basic premise is that outsourcing makes sense if it increases the supply chain surplus (assuming we get to keep some of the increase) without significantly increasing risks. A sourcing decision should aim to increase the net value created by the supply chain.

For example, P&G has historically outsourced retailing of its products to others. The third parties increase the supply chain surplus by aggregating many products that customers need (not just P&G products) in a single retail store. This aggregation allows them to spread facility costs, selling costs, personnel costs, and transportation costs across many consumer goods manufacturers. This aggregation also allows the retailer to increase customer value by allowing them to purchase many products they need in a single visit to the store. Clearly, outsourcing retailing to a third party increases the value created by the supply chain to a greater extent than if P&G managed its own retailing. Good sourcing decisions grow value by assigning each activity within the supply chain to the party that can add the most value.

Effective sourcing processes within a firm can improve profits for the firm, as well as total supply chain surplus, in a variety of ways. It is important that the drivers of improved profits be clearly identified when making sourcing decisions. The following are some of the benefits from effective sourcing decisions:

- Identifying the right source can result in an activity performed at higher quality and lower cost.
- Better economies of scale can be achieved if orders within a firm are aggregated.
- More efficient procurement transactions can significantly reduce the overall cost of purchasing. This is most important for items for which a large number of low-value transactions occur.
- Design collaboration can result in products that are easier to manufacture and distribute, resulting in lower overall costs. This factor is most important for components that contribute a significant amount to product cost and value.

- Good procurement processes can facilitate coordination with the supplier and improve forecasting and planning. Better coordination lowers inventories and improves the matching of supply and demand.
- Appropriate sharing of risk and benefits can result in higher profits for both the supplier and the buyer.
- Firms can achieve a lower purchase price by increasing competition through the use of auctions.

When designing a sourcing strategy, it is important for a firm to be clear on the factors that have the greatest influence on performance and target improvement on those areas. For example, if most of the spending for a firm is on materials with only a few high-value transactions, improving the efficiency of procurement transactions will provide little value, whereas improving design collaboration and coordination with the supplier will provide significant value. In contrast, when sourcing items with many low-value transactions, increasing the efficiency of procurement transactions will be valuable

Key Issues in Global Sourcing

The ‘Amazon Effect’ has resulted in consumers – and increasingly, businesses – who expect a frictionless shopping experience with virtually instant results. This effect has set fire to a global supply chain arms race.

As Wael Safwat, a senior Procurement thought leader, said, “It’s not the organizations that are competing, it’s the supply chains that are competing.”

The ultimate challenge of global supply chain management is to satisfy demand quicker, cheaper, and with less waste than competitors – all while maintaining quality standards. In other words, to succeed in today’s markets, your business must effectively manage a lot of moving parts.

Here are 10 of the top global supply chain challenges to keep in mind, along with tips on how to best handle them.

1. Lead time

*** Buyers increasingly expect faster deliveries.**

“The effect of Amazon is heightened expectations,” says C. John Langley, a clinical professor of supply chain management. “Next week is no longer good enough. It’s got to be on its way now and arrive at its destination within a day or two.”

However, global supply chains often measure shipping times in weeks and months. These long lead times make it challenging to balance supply and demand effectively.

*** Effective planning is the solution.**

Although air freight is more expensive than ocean freight, it’s a lot faster. Consider using land or ocean freight day-to-day, but having air freight agreements in place that you can use quickly to capitalize on sudden increases in demand.

You could also follow Amazon's lead and set up a small network of warehouses close to your target market's locations to store inventory so you can deliver to buyers faster.

2. Delays

Unfortunately, long lead times can expose your shipments to even longer delays. With so many steps in the global supply chain and such large distances for goods to travel, there's many opportunities for things to go wrong.

As a result, it's crucial to have firm completion dates and shipping times. It's also vital to have agreements in place with your partners that outline what happens when things don't go according to plan.

3. Cash flow

Cash flow management is a serious issue in every business, but it's a particularly complicated task in global .

Businesses must keep track and plan for a complex web of expenses. But with so many entities operating simultaneously, it's hard to know where and when to allocate your resources.

For example, if you spend £10,000 on materials, you need to know how much it will cost to turn them into products and get them into customers' hands. This process might include shipping, storage, manufacturing, packaging, freight forwarding, distribution, marketing, sales, and more.

Again, plan ahead. Create a detailed calendar of future expenses and take measures to ensure you'll be able to afford them when the time comes.

4. Data management

By now, you may have realized that there are so many data points to take into account, data management itself is an issue.

“Organizations can quickly become overwhelmed by the vast amount of data today's enterprise systems, connected devices and social networks create,” said Allan Dow, president of the leading AI-based supply chain planning solution Logility.

This is why a survey by Logility and APICS, the association for supply chain management, found that:

- 36% of respondents see the opportunity to balance supply and demand as a top driver for their analytics initiative.
- 19% of companies want to leverage machine learning to improve their business's forecast accuracy.

In short, to manage the global supply chain effectively, businesses must use and customise a suitable data management solution.

5. Exposure to risk

Many countries providing relatively inexpensive labour and manufacturing costs also typically have less stable governments and currencies. Local changes in leadership and policy can often affect the global supply chain.

What's more, global supply chains are exposed to risks that local supply chains aren't, such as international policy changes, for example, Brexit.

Companies have very little control over these factors, so it's best to 'hope for the best and prepare for the worst.'

Set up prospective agreements with suppliers, manufacturers, and freight forwarders in another region or country to fall back on. You may also want to secure appropriate insurance policies to cushion potential blows.

6. Accountability and compliance

Companies have to consider social compliance when doing business internationally.

Unfortunately, modern slavery, child labour practices, unacceptable working conditions and unfair compensation are just some of the unethical practices present in global supply chains.

As time goes on, there are more and more ways to verify supply chain partners to ensure ethical standards are followed. However, there's often no way to be certain that everything is above board.

Companies must manage the risks associated with these issues: potential brand damage, legal action, and most importantly, the irreparable harm caused to individuals in exchange for profit.

Signing up to schemes such as the Certified B Corporation and Amfori's Business Social Compliance Initiative (BSCI) is a great way to handle these risks.

7. Quality control and defects

Quality issues can also be challenging to manage. For example, businesses must consider the differences in acceptable defect levels in different countries.

It's essential to clarify the quality level expected and the percentage of acceptable defects ahead of time. It's also best to define who is responsible and what happens should there be a disagreement in the future.

8. Language barriers

Another drawback to consider is that many countries will conduct day-to-day operations in a different language.

You can manage these types of issues by employing professional interpreters with specialist industry knowledge. Plus, it's always worth clarifying expectations and responsibilities in writing.

9. Time zones

Time zones can also make communication difficult. For example, the time difference between the centre of America and central China is a whopping 15 hours.

When there's no overlap in working hours, you can't just pick up the phone.

Instead, communication often happens via email and messaging platforms. In this situation, you'll usually have to wait until the next day to receive an answer. This can make it very challenging to oversee technical aspects of the production process.

For this reason, many companies set up small outposts of company representatives to manage things locally in each region of the global supply chain.

10. Exchange rate and foreign transaction costs

Exchange rate fluctuations matter little when taking a holiday abroad. However, even the smallest changes in foreign exchange rates can increase costs significantly when managing a global supply chain.

Developing countries may offer the cheapest labour rates globally, but they often have relatively unstable currencies that are susceptible to regional influences.

Another consideration is the high cost of international transactions when using a bank. These fees can quickly add up and hurt your margins. Try to make large purchases when your domestic

currency is strong and avoid hefty international banking fees with an innovative global payment provider.

5 Benefits of Global Supply Chains

If there are so many global supply chain management challenges to overcome, why don't companies use a local supply chain? Here are five key benefits of global supply chain networks that you can use to grow your company.

1. More options

Global supply chain networks can offer significant sourcing advantages.

When using a global supply chain, businesses gain access to a more extensive selection of suppliers and manufacturers than they would if they limited themselves to a local supply chain. You can see the endless options available for yourself on online B2B marketplaces like Alibaba or IndiaMart.

As a result, businesses can select the highest-quality suppliers, labour, and products in the world. They can also find materials, products, and manufacturing facilities that aren't available domestically.

2. Savings

Perhaps the most critical advantage of global supply chain networks is the many chances to save money. More sourcing options means more opportunities to cut costs, ensuring economic viability and increasing margins.

This may seem counterintuitive at first – surely, moving goods around the world costs more than keeping things local? When it comes to the total shipping and distribution costs, this may be true. However, savings on sourcing, manufacturing, and labour can easily outweigh increased shipping and distribution costs.

3. New markets

Another critical benefit of global supply chain networks is that they create opportunities to expand your business internationally.

For example, say that your company sells products in Europe, but has a presence in China to oversee product sourcing and manufacturing. In this instance, it would be relatively easy to start selling your products in China and other south-east Asian countries.

4. Risk mitigation

As noted above, global supply chains can expose companies to additional risks. However, the opposite is also true.

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If you use a domestic supply chain, all of your eggs are in one basket – your country’s basket, that is. If there was a natural disaster or economic recession, it’s possible that your entire business could ground to a halt.

However, if you were to position each of your global supply chain stages in different countries, the diversification can help minimize the effect of local interruptions.

Plus, it’s likely that you would already have connections and relationships with alternative entities in other countries. So, should disaster strike, you would be in a better position to redirect your supply chain and keep the company turning a profit.

5. Opportunities to learn

A surprising benefit of global supply chain networks is their effect on learning and development

Companies operating globally can learn valuable lessons for different business cultures, practices, and perspectives.

Plus, innovative new practices and processes that haven’t reached your home country can quickly find their way into the global supply chain, providing another competitive advantage over companies using a local supply chain.

Global supply chain management challenges

Global supply chain management involves administering and directing many different entities to source materials, manufacture products, and distribute them to customers.

In 2021, supply chains are working furiously to deliver goods and services faster, cheaper, and with less waste than competitors – all while maintaining quality.

In summary, here are 10 top supply chain challenges to overcome:

1. Cash flow
2. Lead times
3. Delays

4. Data management
5. Exposure to risk
6. Accountability and compliance
7. Quality control and defects
8. Language barrier
9. Time zones
10. Exchange rate and foreign transaction costs

Remember, although global supply chains present several complex challenges, they also provide compelling advantages, such as more sourcing options, lower labour costs, and opportunities to expand internationally.

Outsourcing:

Outsourcing is a business practice in which a company contracts out certain tasks or functions to external service providers rather than handling those tasks in-house. The primary motive behind outsourcing is to improve efficiency, reduce costs, and focus on core business activities.

When a company decides to outsource, it typically involves hiring another company or individual to perform specific functions, such as information technology services, customer support, manufacturing, or other business processes. This can be done domestically or internationally, depending on the cost-effectiveness and expertise of the outsourcing partner.

Outsourcing has become a widespread practice in various industries, enabling companies to access specialized skills, lower labour costs, and increase flexibility in their operations. However, it also poses challenges such as communication barriers, quality control issues, and potential risks associated with depending on external entities for critical business functions.

The seven outsourcing factors to consider are:

1. Savings.
2. Pricing and Quality.
3. Technology and Resources.
4. Meeting Deadlines.

5. Visiting Your Vendor
6. Service Level Agreement
7. Communication.

Factors influencing Outsourcing

Factors to Consider for Outsourcing Decisions

1) Savings: Outsourcing must reduce operational costs and therefore improve your bottom line. To see if outsourcing will be cost-effective, analyze whether it will reduce the capital you need to spend on purchasing equipment and hiring employees. Make sure you take into account the quality as well as the quantity of services provided by the outsourcing firm.

2) Pricing and Quality: Outsourcing can give you access to a number of different vendors who can offer products and services at a competitive price. But don't just go for the least expensive vendor: compare vendors to see what you will get from each by price as well as quality and additional services.

3) Technology and Resources: Make sure you check the technologies and other tools each vendor plans to use on your project. Are the employees appropriately trained for your assignments and capable of handling your needs? Asking this will help you assess vendors to determine who has the technology and resources to handle your business functions in a seamless manner.

4) Meeting Deadlines: Timeliness is another important factor to consider in addition to cost. Missed deadlines on the part of the vendor can generate major bottlenecks for you that could reduce your cost savings. Inquire about a vendor's quality control and backup measures in the case of missed deadlines before signing a contract.

5) Visiting Your Vendor: Visit the vendor's site before finalizing the contract, and do additional due diligence research to learn as much as you can about the reliability of your vendor, as well as the safety practices of the team and the vendor's infrastructure. If possible, contact past clients of the vendor to gather references.

6) Service Level Agreement: The Service Level Agreement, or SLA, is a critical document for outsourcing partnerships. Make sure that each detail in the document is clearly spelled out so that there is no ambiguity. Consider hiring a lawyer to review and possibly amend this document.

7) Communication: Make sure that your vendor is able to reply promptly to any questions or concerns, especially if you are working with an offshore team in a different time zone. The

vendor's communication skills also need to be up to par to ensure that they are able to understand and address your business requirements.

4 Non-price Factors to Consider when Choosing Outsourcing Destination

1) Geopolitical Risk: Assess the political environment of the outsourcing destination, including whether the government supports the outsourcing industry through investment or other means. A sudden change in the destination country's political arena could lead to significant disruptions in your business.

2) Resource Quality: The quality of the workforce will directly affect the success of your outsourcing initiative. Assess whether the talent pool is adequately certified and trained to meet your requirements, while keeping in mind the potential to meet growing staffing requirements in the future.

3) Technology Infrastructure: The reliability of any technology infrastructure will be critical for continuity in the case of unexpected equipment failures. Take factors like security, including continuity solutions and backup infrastructure, as well as availability and connectivity into consideration.

4) Legal Considerations: Legal protections vary by jurisdiction and national legislation. Research legal protections for your specific outsourcing initiative. It is especially important to consider regulations regarding preserving client confidentiality and other sensitive information.

Supply Chain Network Design (SNDC)

Supply Chain Network Design (SNDC) also known as 'strategic supply chain planning' is the process for building and modelling the supply chain to understand the costs and time to bring goods and services to market within an organisation's available resources.

Factors affecting the network design decisions:

1. Strategic Factors

A firm's competitive strategy has a significant impact on network design decisions within the supply chain. Firms that focus on cost leadership tend to find the lowest cost location for their manufacturing facilities, even if that means locating far from the markets they serve.

2. Technological Factors

Characteristics of available production technologies have a significant impact on network design decisions. If production technology displays significant economies of scale, a few high-capacity locations are most effective. This is the case in the manufacture of computer chips, for which factories require a large investment and the output is relatively inexpensive to transport. As a result, most semiconductor companies build a few high-capacity facilities.

3. Macroeconomic Factors

Macroeconomic factors include taxes, tariffs, exchange rates, and shipping costs that are not internal to an individual firm. As global trade has increased, macroeconomic factors have had a significant influence on the success or failure of supply chain networks. Thus, it is imperative that firms take these factors into account when making network design decisions.

4. Infrastructure Factors

The availability of good infrastructure is an important prerequisite to locating a facility in a given area. Poor infrastructure adds to the cost of doing business from a given location. In the 1990s, global companies located their factories in China near Shanghai, Tianjin, or Guangzhou—even though these locations did not have the lowest labour or land costs—because these locations had good infrastructure. Key infrastructure elements to be considered during network design include availability of sites and labour, proximity to transportation terminals, rail service, proximity to airports and seaports, highway access, congestion, and local utilities.

5. Competitive Factors

Companies must consider competitors' strategy, size, and location when designing their supply chain networks. A fundamental decision firms make is whether to locate their facilities close to or far from competitors. The form of competition and factors such as raw material or labour availability influence this decision.

6. Customer Response Time and Local Presence

Firms that target customers who value a short response time must locate close to them. Customers are unlikely to come to a convenience store if they have to travel a long distance to get there. It is thus best for a convenience store chain to have many stores distributed in an area so most people have a convenience store close to them. In contrast, customers shop for larger quantity of goods at supermarkets and are willing to travel longer distances to get to one. Thus, supermarket chains

tend to have stores that are larger than convenience stores and not as densely distributed. Most towns have fewer supermarkets than convenience stores.

7. Logistics and Facility Costs

Logistics and facility costs incurred within a supply chain change as the number of facilities, their location, and capacity allocation change. Companies must consider inventory, transportation, and facility costs when designing their supply chain networks.

Inventory and facility costs increase as the number of facilities in a supply chain increase. Transportation costs decrease as the number of facilities increases. If the number of facilities increases to the point at which inbound economies of scale are lost, then transportation costs increase. For example, with few facilities, Amazon has lower inventory and facility costs than Barnes & Noble, which has hundreds of stores. Barnes & Noble, however, has lower transportation costs.

"HUB & SPOKE" and "Distributed Warehouses"

"HUB & SPOKE" and "Distributed Warehouses" are two different approaches to organizing the storage and distribution of goods in a supply chain. Each approach has its advantages and disadvantages, and the choice between them depends on various factors like the company's size, the nature of its products, geographical distribution, and customer demand patterns.

Hub and spoke is a term used to describe any process that resembles the wheel of a bicycle, where paths (spokes) shoot out from a central location (the hub). In the logistics industry, a hub and spoke distribution model is used to disperse inventory to multiple fulfillment centers from a large distribution center.

Here are some examples of companies or industries that commonly use the HUB & SPOKE model in their supply chain and distribution operations:

- Package Delivery Companies
- Airline Industry
- Retail Chains
- E-commerce Fulfillment

- Postal Services
- Beverage Companies

V/S

Distributed Warehouses

The term "distributed warehouse" refers to a distribution strategy where a company maintains multiple warehouses or distribution centers in different geographic locations. Each warehouse acts as a regional or local hub for receiving, storing, and distributing products to customers in its vicinity. This approach allows the company to have a decentralized network of storage and distribution points rather than relying on a single central hub.

Hub and Spoke

- Inventory is concentrated in a central hub and then distributed to the spokes as per demand.
- Longer lead times for customers farther from the central hub.
- Vulnerable to disruptions at the central hub, which can impact the entire supply chain.

V/S

Distribution Warehouse

- Inventory is dispersed across multiple warehouses, each catering to a specific region or customer base.
- Shorter lead times for customers due to warehouses being closer to their location.
- More resilient as disruptions at one warehouse have a limited impact on the rest of the network.

