What is Supply Chain Optimization?

Worksheet

Supply chain optimization aligns procurement, manufacturing, warehousing, and distribution to minimize total cost while meeting customer demand. Key levers include network design (location of factories/warehouses), supplier selection, inventory management, and demand forecasting.

Questions

1. Supply chain optimization primarily aims to

A) increase product price
B) minimize total cost while meeting demand
C) eliminate all inventory
D) only focus on speed

2. The bullwhip effect occurs when

A) suppliers are too slow
B) small demand changes amplify upstream
C) warehouses are too far apart
D) no safety stock exists

3. Network optimization (locations of factories/warehouses) affects

A) only product cost
B) only transportation cost
C) both transportation and inventory holding costs
D) customer satisfaction only

4. Demand forecasting in supply chain is critical to

A) set product prices
B) reduce safety stock requirements and plan production
C) eliminate suppliers
D) ignore inventory

5. A company ships 10,000 units annually. Each shipment costs 200, and warehousing costs 0.50/unit/month. How much inventory capital is tied up annually if average inventory is 2,000 units?

6. A supplier is 30 days away. With daily demand of 100 units, what is the minimum safety stock to prevent stockouts?

7. A company consolidates from 5 warehouses to 2. Fixed warehouse cost is 50k/warehouse/year. How much can it save?

8. Define: What is supply chain optimization?

9. Define: Key levers in supply chain optimization?

10. Define: What is the bullwhip effect?

Answer Key

1. B) minimize total cost while meeting demand - Optimization balances cost, service, and flexibility. Eliminating all inventory or only focusing on speed creates inefficiencies.

2. B) small demand changes amplify upstream - The bullwhip effect: retail demand fluctuation larger wholesale swings even larger factory order swings.

3. C) both transportation and inventory holding costs - Location decisions impact transportation distance, delivery times, and the number of warehouses needed to hold inventory.

4. B) reduce safety stock requirements and plan production - Accurate forecasting reduces uncertainty, allowing leaner inventory and better production planning.

5. Annual warehousing cost = 2000 units 0.50/unit/month 12 months = 2000 6 = 12,000 Annual logistics (shipping) = 10,000 units 0.20/unit = 2,000 Total annual supply chain cost 14,000

6. Lead time demand = 30 days 100 units/day = 3,000 units If no safety stock: reorder at 3,000 units With 1-week safety buffer: add 700 units (7 days 100 units) Reorder point = 3,700 units

7. Current annual fixed cost = 5 50,000 = 250,000 New annual fixed cost = 2 50,000 = 100,000 Savings = 250,000 100,000 = 150,000/year

8. Integrating sourcing, production, logistics, and distribution to minimize costs, reduce lead times, and improve service levels.

9. Network design (factory/warehouse locations), supplier selection, inventory management, demand forecasting, and logistics routing.

10. Demand variability amplifies upstream in the supply chain. Small changes in retail demand cause large swings in factory orders.