CLTD

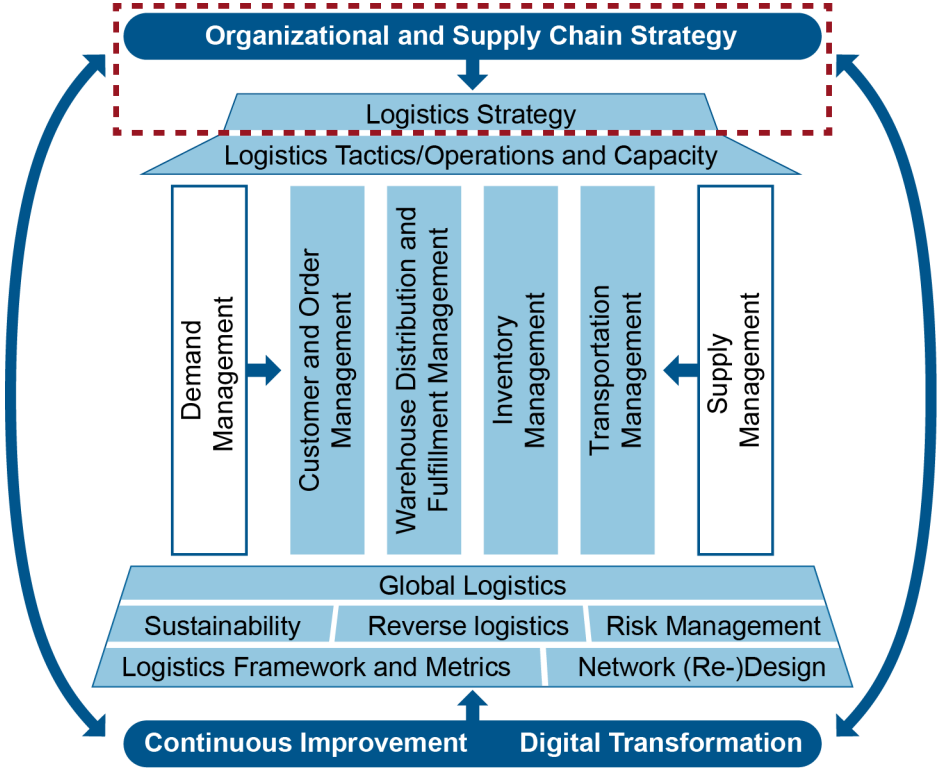
CERTIFIED IN LOGISTICS,
TRANSPORTATION AND DISTRIBUTION

MODULE 1:
LOGISTICS FUNDAMENTALS AND STRATEGY

APICS

ascm

Module 1 Overview



CLTD

CERTIFIED IN LOGISTICS,
TRANSPORTATION AND DISTRIBUTION

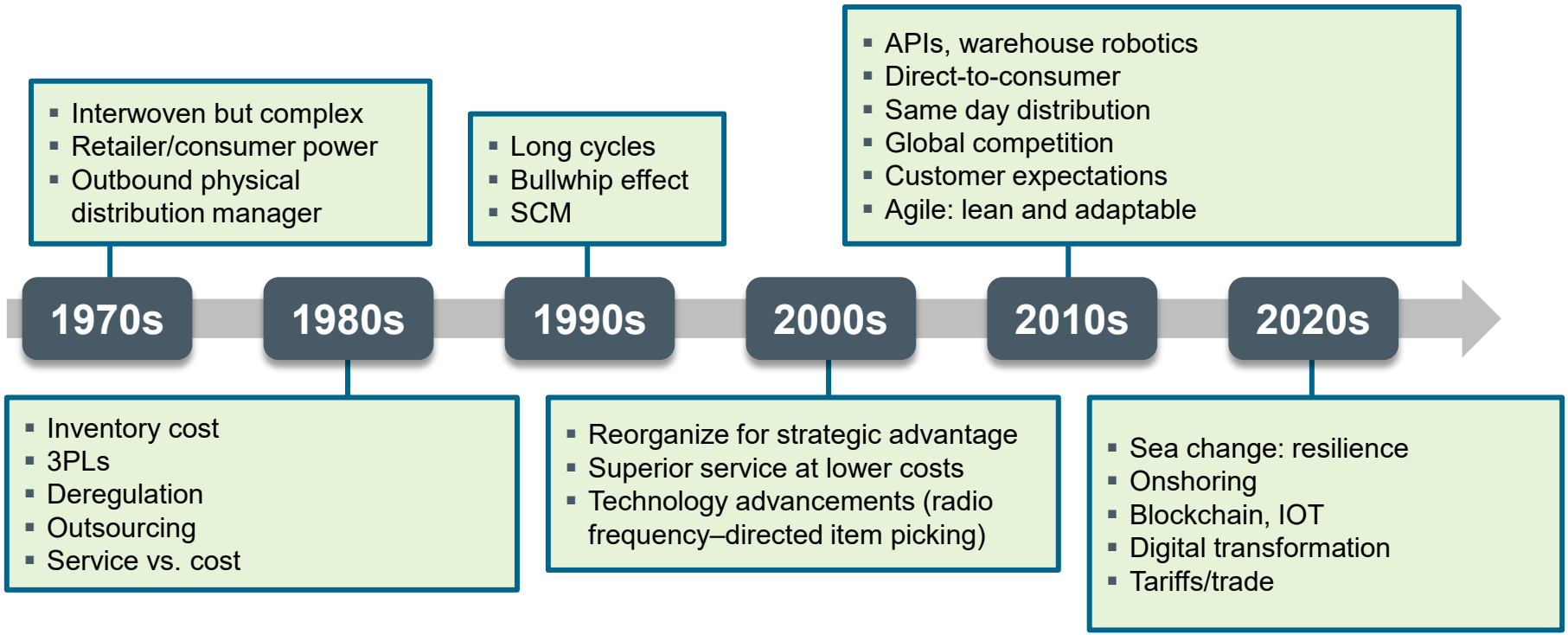
MODULE 1, SECTION A: RECOGNIZE LOGISTICS FUNDAMENTALS

APICS

ascm

Understand Logistics History, Definitions, and Scope

Logistics Through the Decades



What Is Logistics?

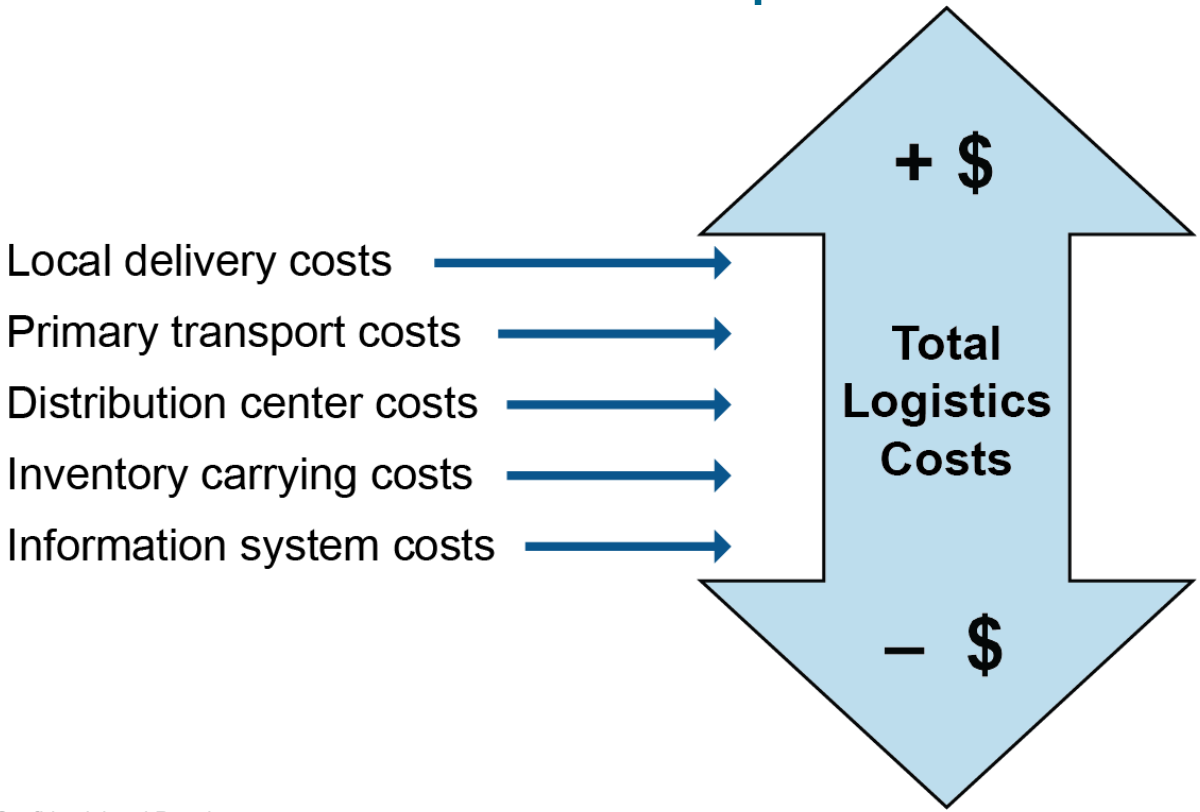
- Designs, plans, executes, and controls forward and reverse movement, storage, and handling of goods
- Optimizes goals:
  - Effectively meet customer requirements
  - Efficiently minimize total system cost
- Logistics = physical supply + distribution
- Coordinates
  - Supply and demand
  - Subsystems and people

Definitions of Logistics

- Warehousing
- Transportation
- Imports/exports
- Packaging
- Materials handling
- Inventory management
- Order management
- Warehouse management/ transportation execution systems

Recognize Total Cost Concept and Tradeoffs

Systems or Total Cost Concept



Recognize Total Cost Concept and Tradeoffs

Interrelated: Warehousing, Transportation, and Inventory

One End of Spectrum

- Slower transport: more inventory and warehousing, long lead times
- More warehouses: less transport cost, more inventory carrying cost
- Close to suppliers: cheaper inbound

DC Layout and Capabilities

- Impact transport frequency and inventory

Other End of Spectrum

- Faster transport: less inventory and warehousing, higher transport costs
- Fewer warehouses: more transport cost, less inventory carrying cost
- Close to customers: cheaper outbound

Recognize Total Cost Concept and Tradeoffs

Tradeoffs

Logistics Area	Common Tradeoffs
Import/export	Lean or just in time (JIT): ↓ inventory ↑ transportation (fewer truckloads)
Packaging	Ocean and rail versus air
Demand management and forecasting	Early forecast timely, less accurate
Purchasing	Must consider transportation cost and lead time

Recognize Total Cost Concept and Tradeoffs

Tradeoffs

Logistics Area	Common Tradeoffs
Production planning	Operating environment strongly affects type of inventory.
Materials handling	Equipment, automation impact DC capacity, labor, cost.
Order management	Speeding this up can reduce strain elsewhere.
Logistics information systems	Information replaces inventory (e.g., reroute).
Customer management	Short lead time quotes require more DCs.

Recognize Total Cost Concept and Tradeoffs

Tradeoffs With Other Stakeholders

Finance

- Want to control logistics budget
- Productivity suffers due to low-value units
- Unit-driven budget: more units moved than planned

Production

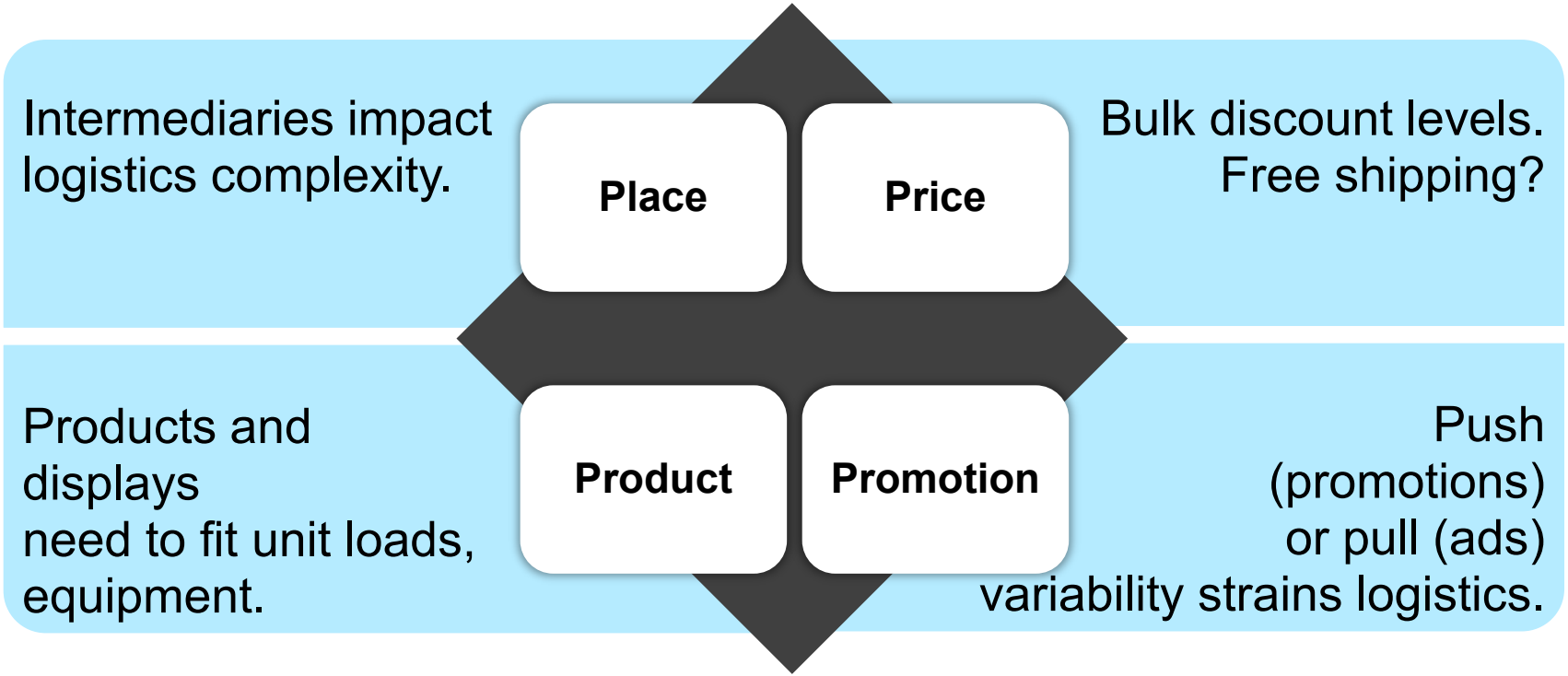
- Want long production runs and few changeovers
- Account for inventory buildup

Sales/Marketing

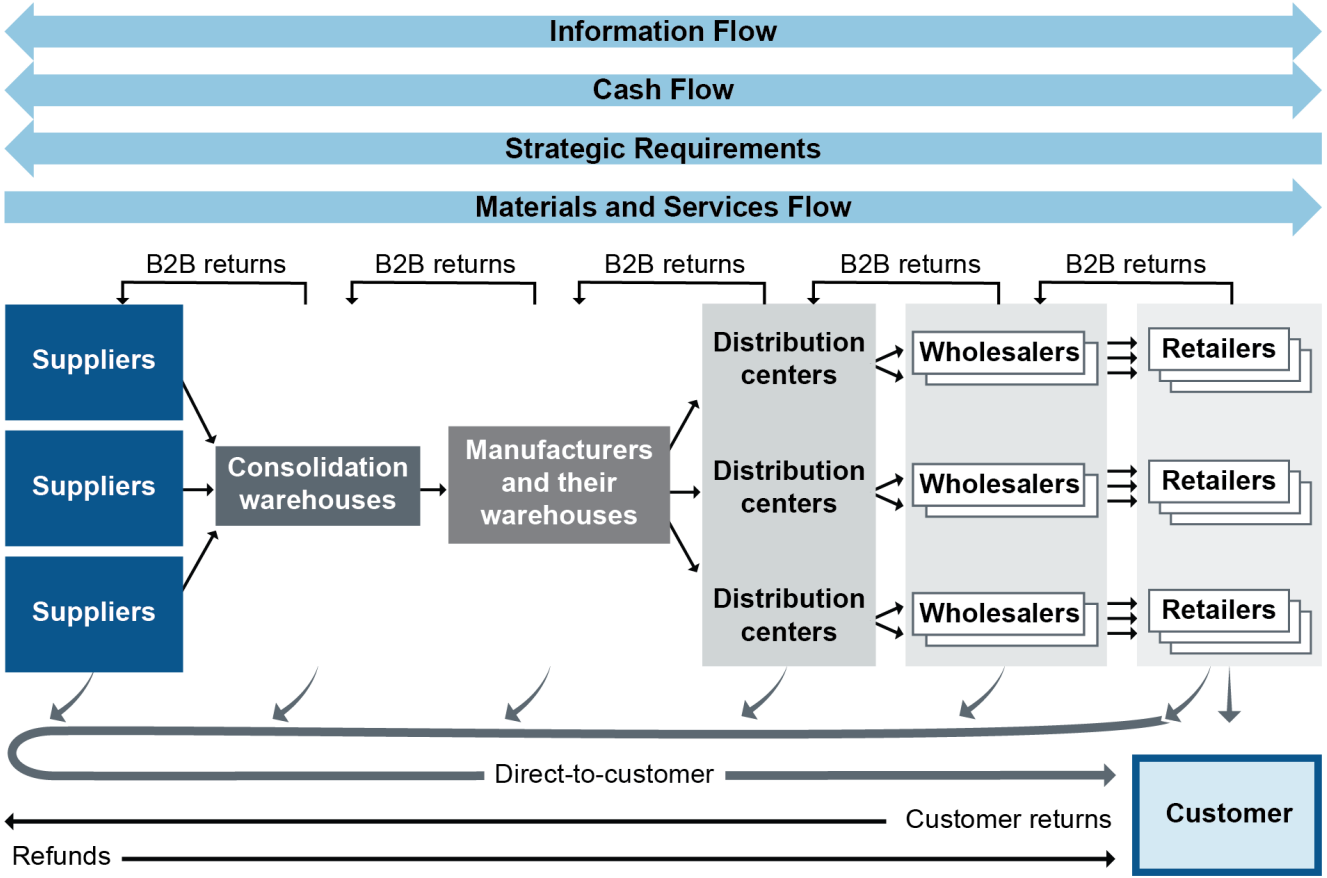
- Want short lead times, no stockouts, no damaged goods
- Add DCs, inventory, and packaging
- Postponement

Recognize Total Cost Concept and Tradeoffs

Tradeoffs Related to the 4Ps of Marketing

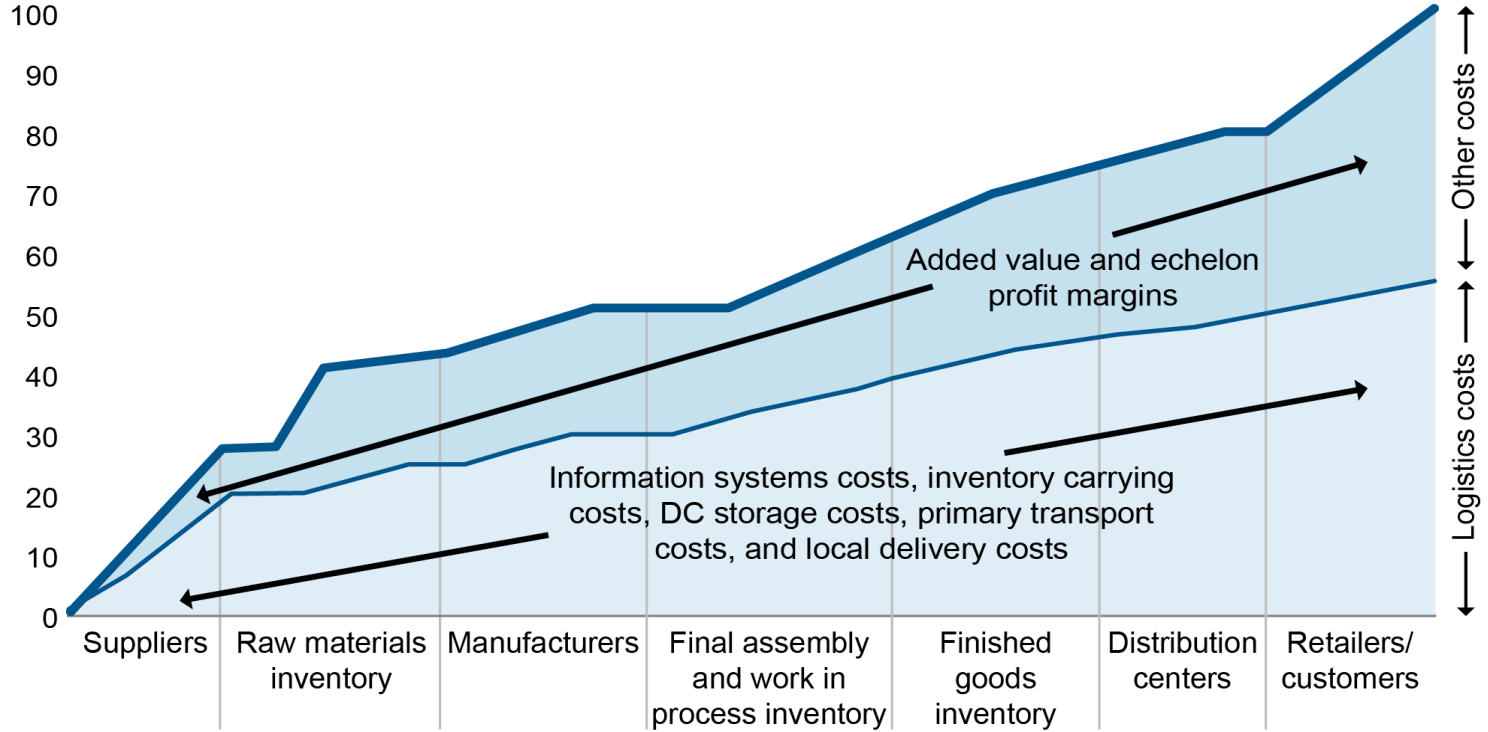


Consider Principles, Components, and Drivers of Logistics



Consider Principles, Components, and Drivers of Logistics

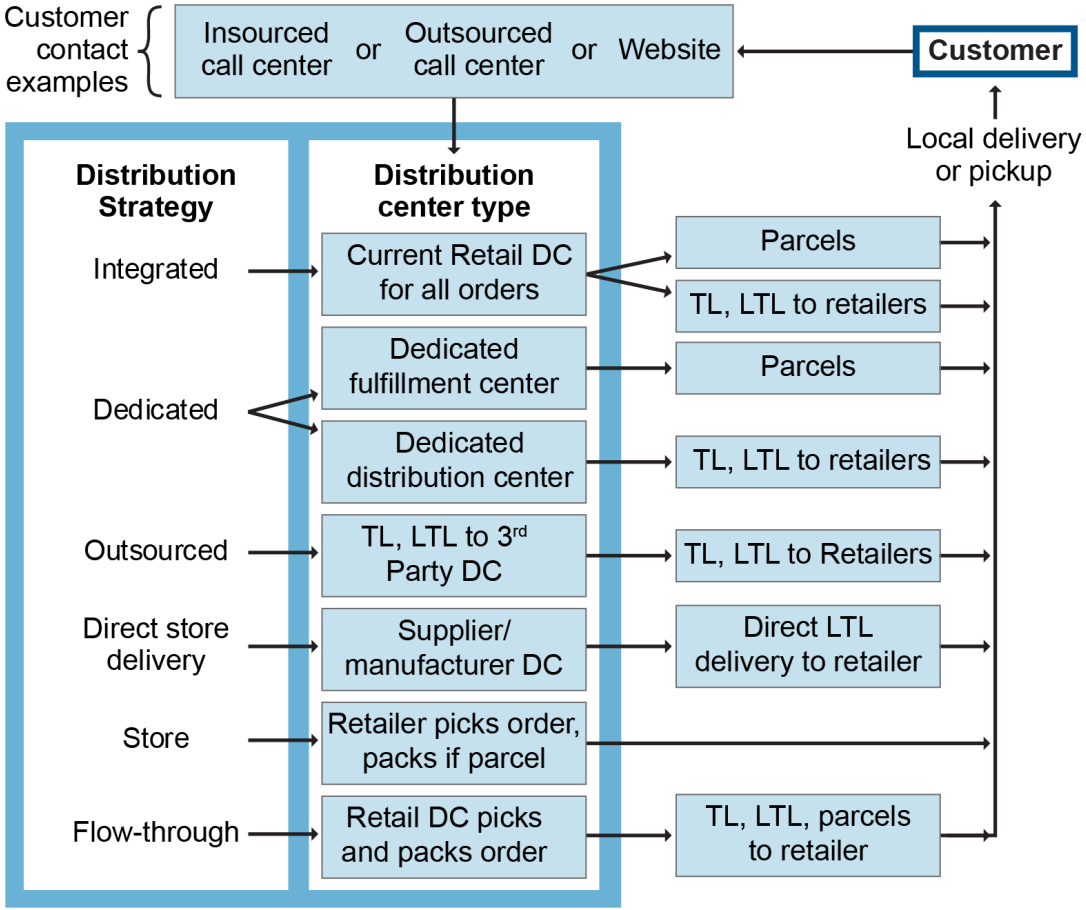
Cumulative Logistics Cost Reveals Waste



Source: Adapted from *The Handbook of Logistics and Distribution Management,* Rushton, Croucher, and Baker.

Consider Principles, Components, and Drivers of Logistics

Direct-to-Consumer or Omni-Channel Strategies



Consider Principles, Components, and Drivers of Logistics

Logistics Utility

Time

Place

Possession

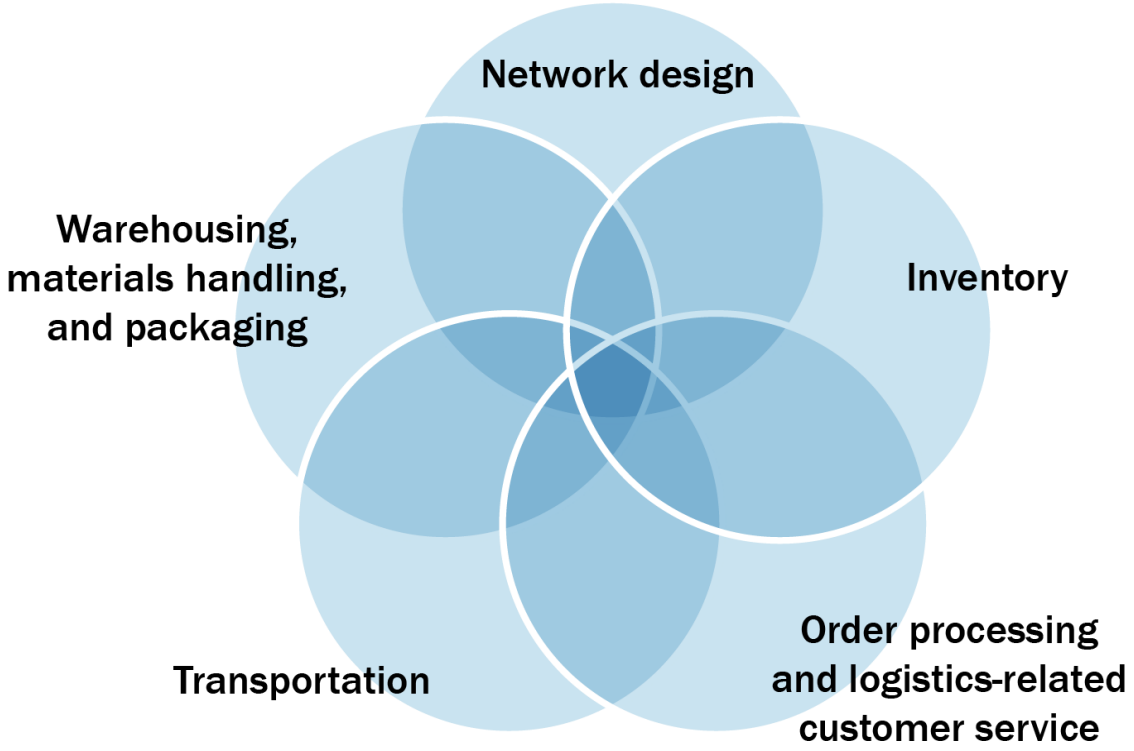
Form

Quantity

Information

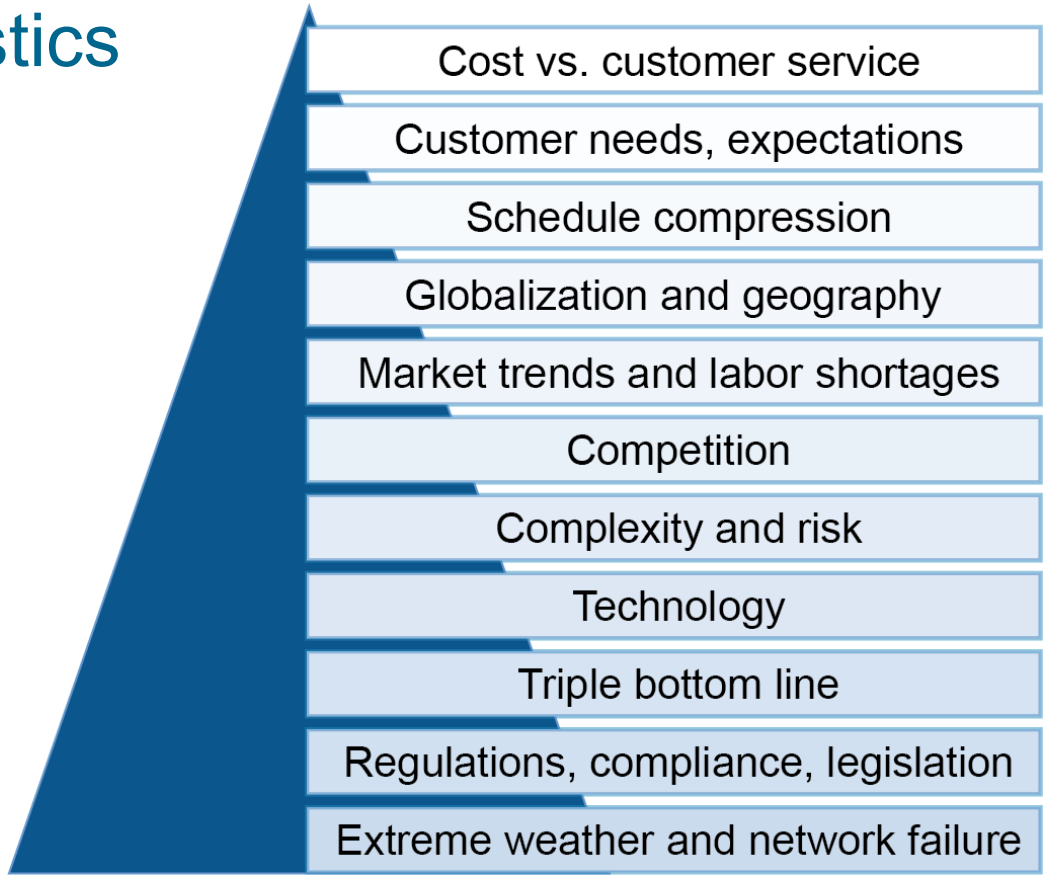
Service

Grouping Components for Integration

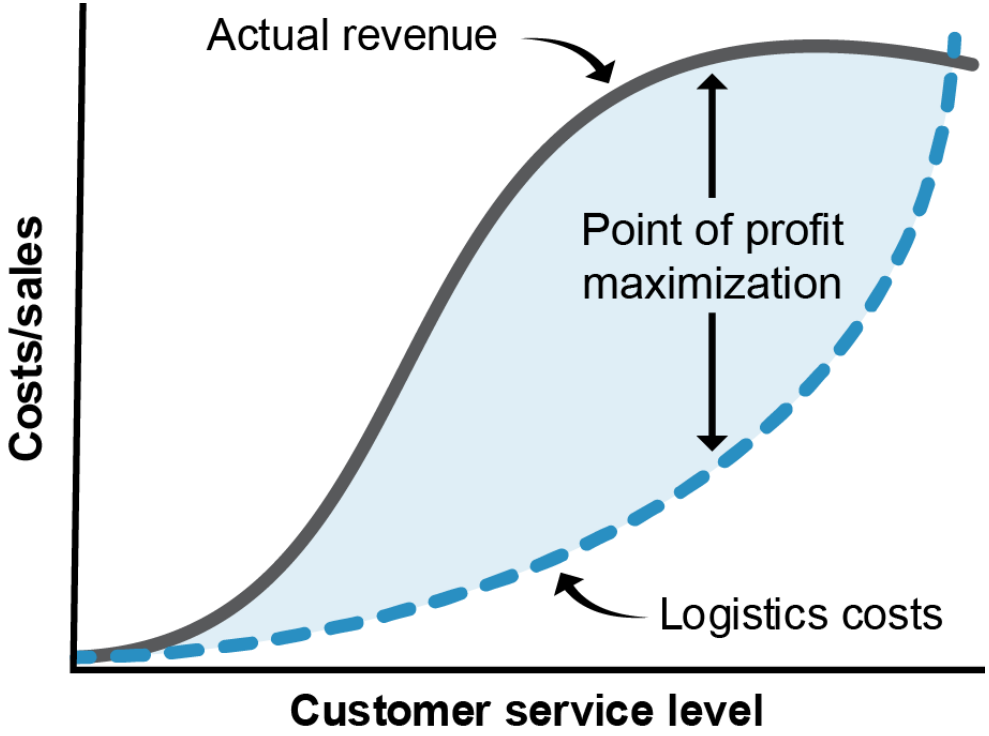


Consider Principles, Components, and Drivers of Logistics

Drivers of Logistics



Cost-Revenue Tradeoffs



Source: Professor M. C. Holcomb, University of Tennessee. Used with permission.

CLTD

CERTIFIED IN LOGISTICS,
TRANSPORTATION AND DISTRIBUTION

MODULE 1, SECTION B: DISCERN THE ROLE, VALUE, AND COST OF LOGISTICS

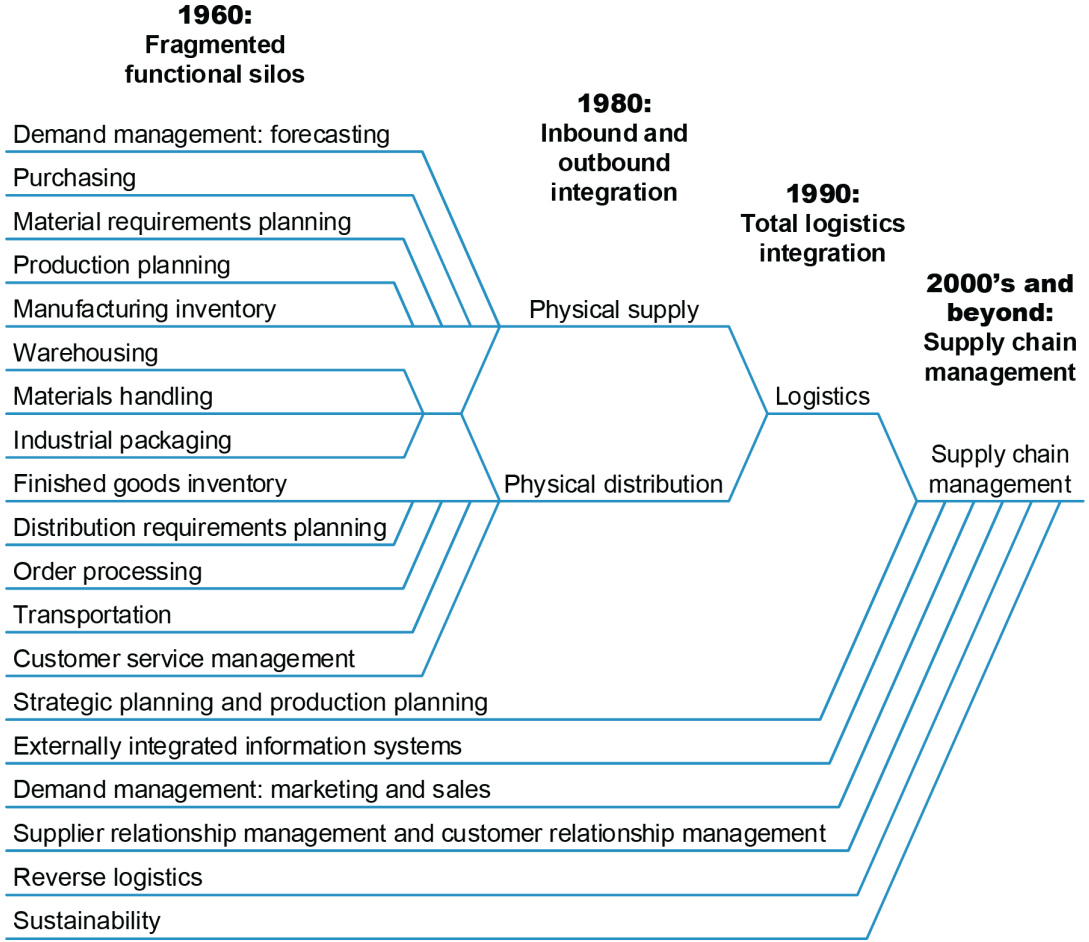
APICS

ascm

SCM and Logistics

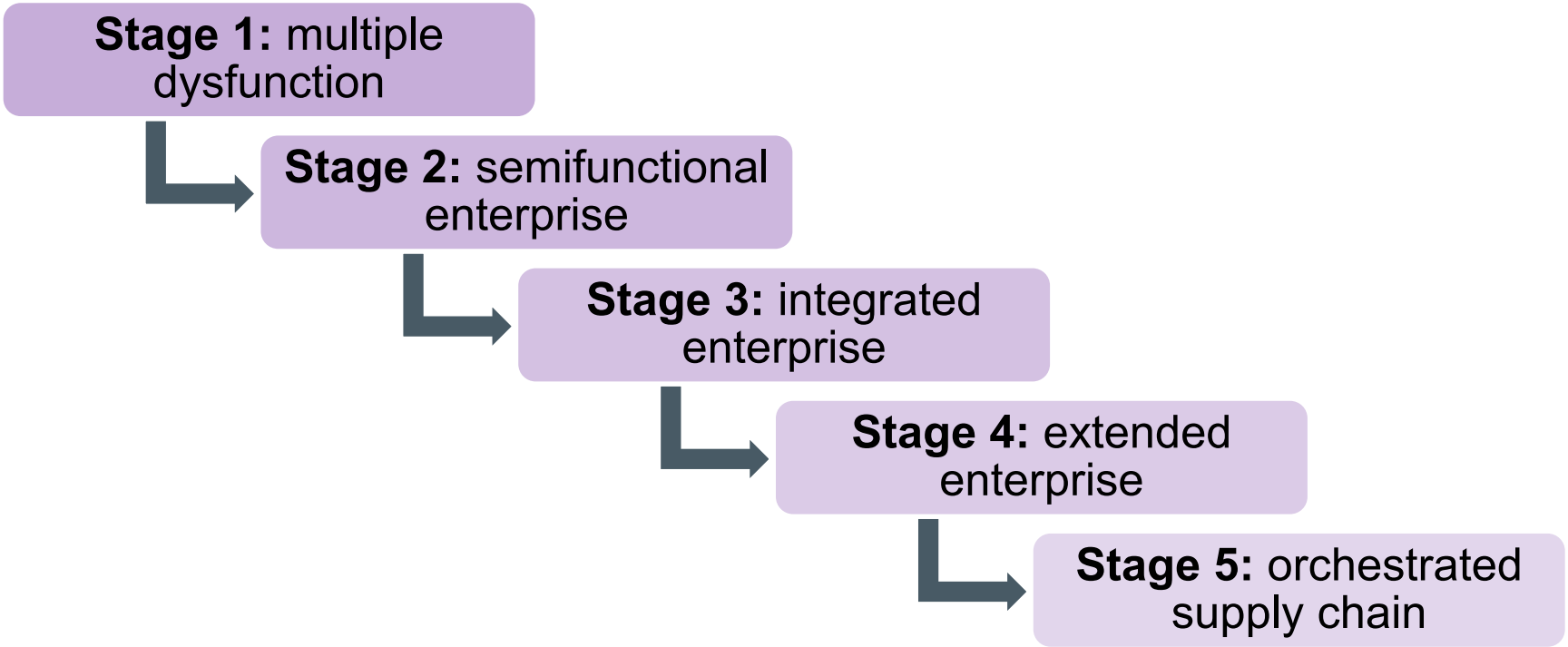
SCM = Suppliers + Production Planning + Logistics + Customers

Understand Logistics in a Supply Chain Management Context



Understand the Supply Chain Maturity Stages

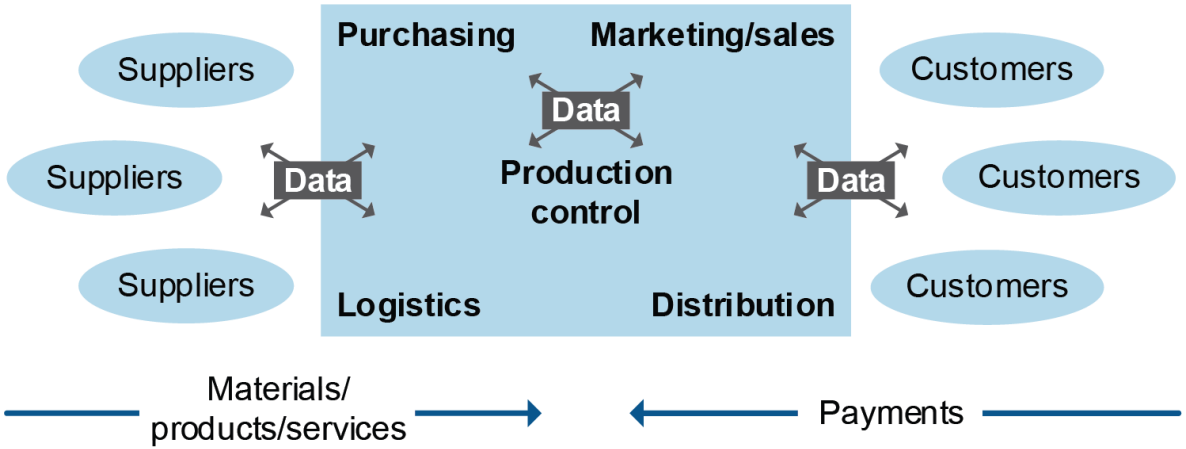
Levels of Maturity



Understand the Supply Chain Maturity Stages

Stage 1: Multiple Dysfunction

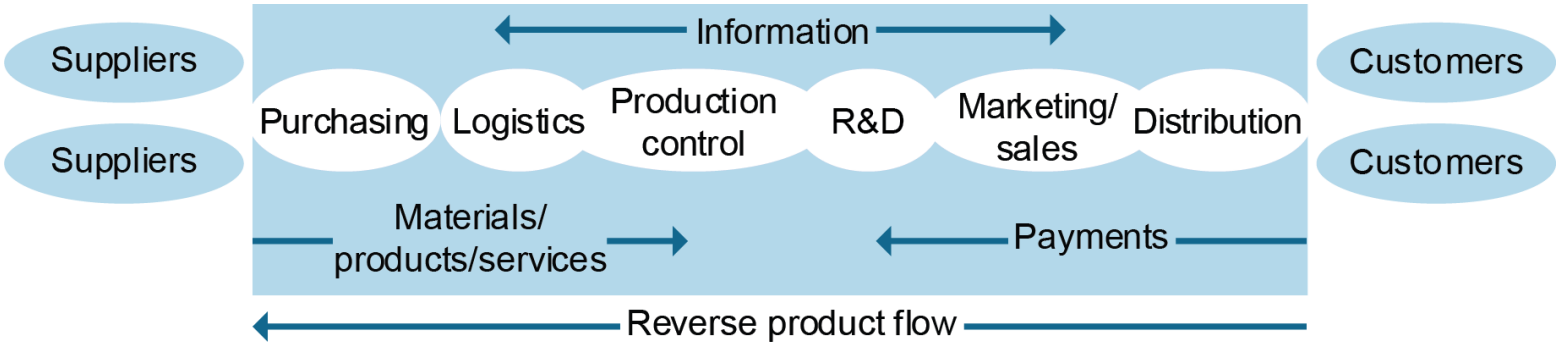
No clear, coordinated information flows or partner relationships, internal definitions or goals, or external links (except transactions)



Understand the Supply Chain Maturity Stages

Stage 2: Semifunctional Enterprise

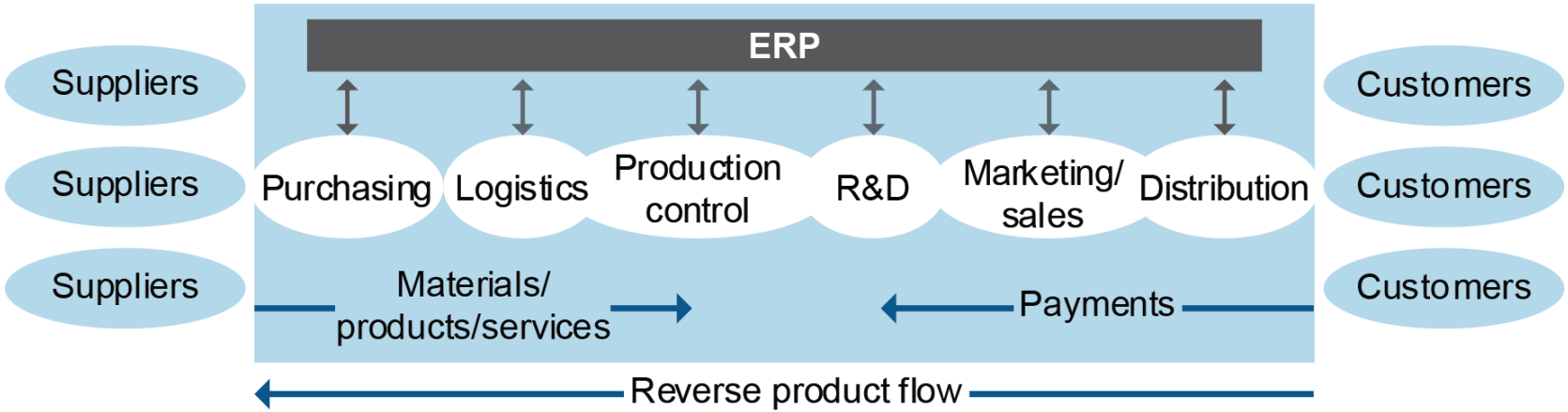
- Improved information flow
- Defined functional areas work sequentially without collaborating on effective ways to create value
- No supplier or customer partnerships



Understand the Supply Chain Maturity Stages

Stage 3: Integrated Enterprise

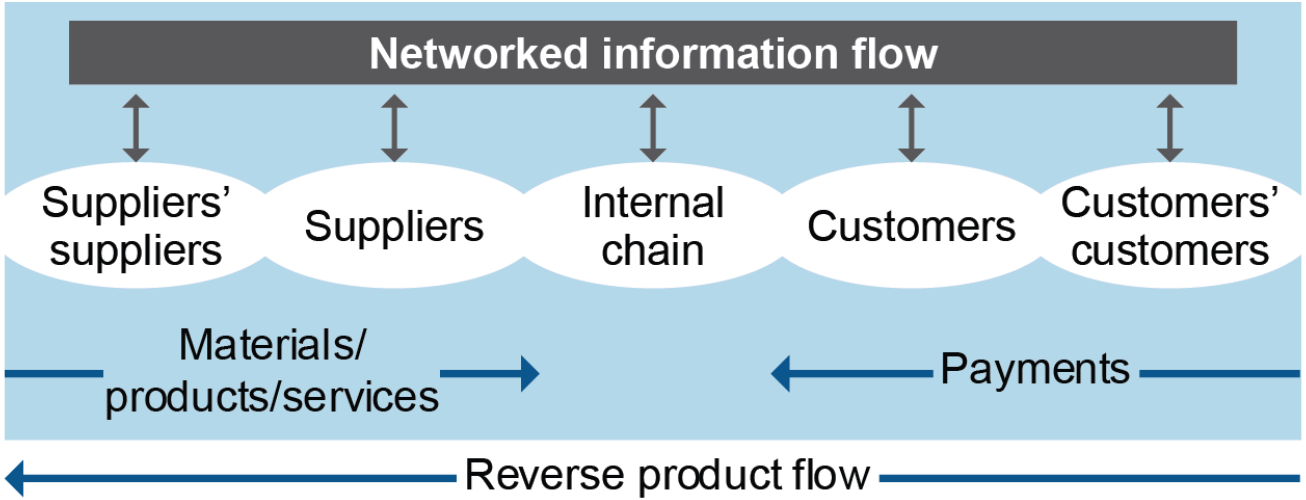
- Better cross-functional integration of ERP software, cross-functional communication, training
- Centrally located and easily accessible databases and files



Understand the Supply Chain Maturity Stages

Stage 4: Extended Enterprise

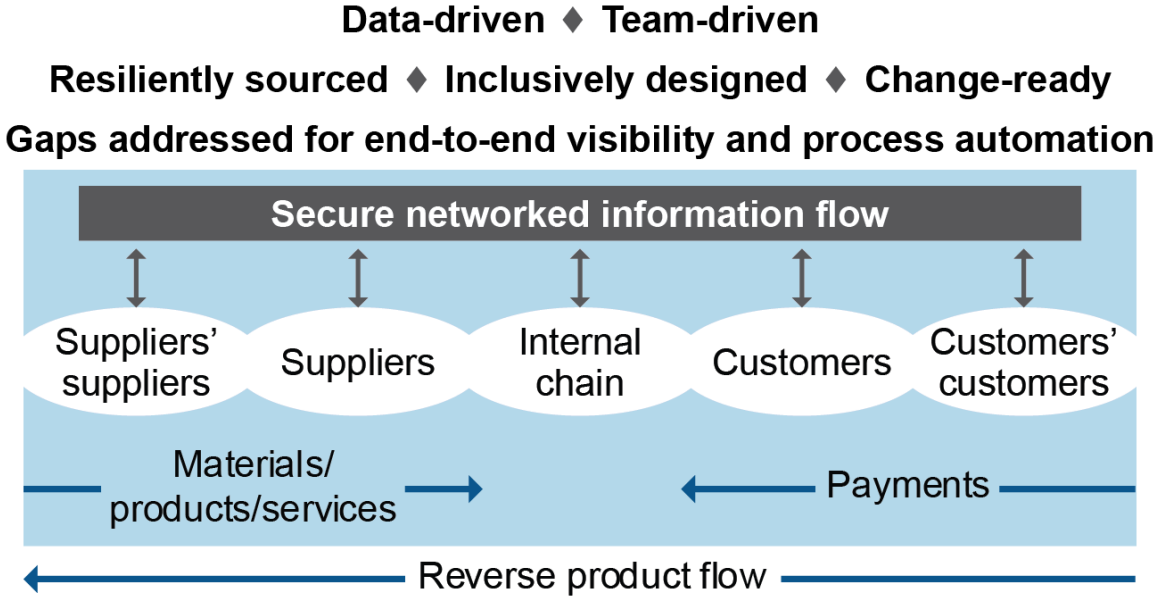
Extends at least one business process beyond organization



Understand the Supply Chain Maturity Stages

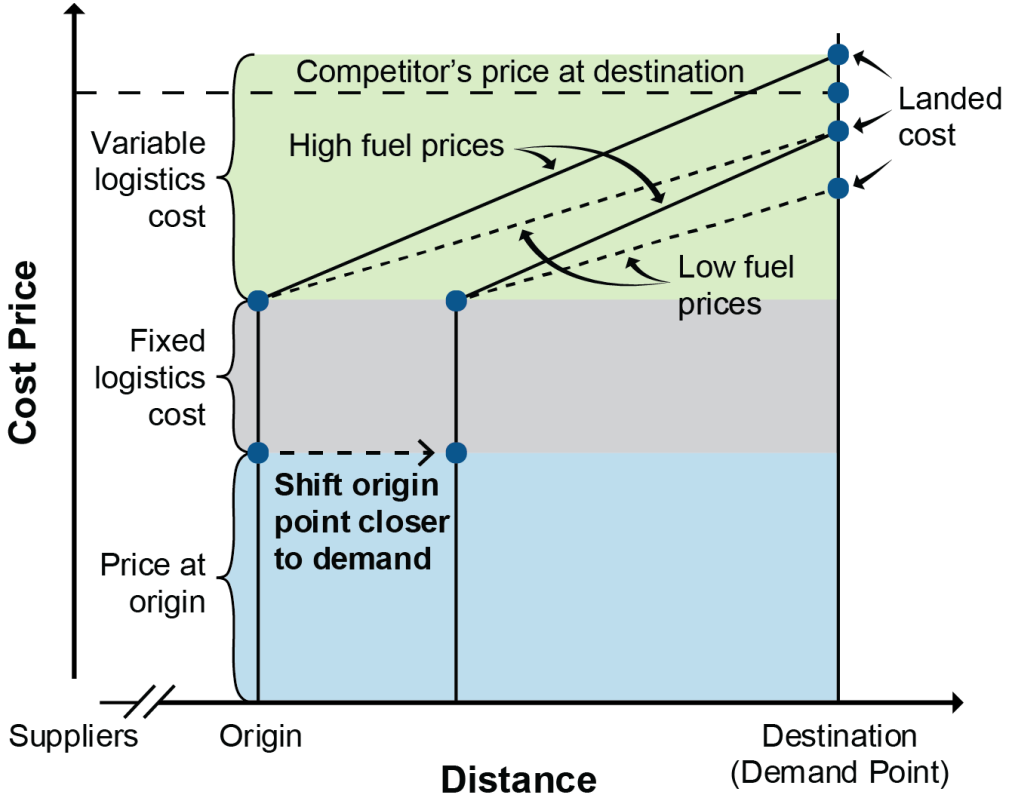
Stage 5: Orchestrated Supply Chain

- Digital transformation
- Relative
  - Competitive advantage?
  - Close gaps
- People are ready



Economic Impact of Logistics

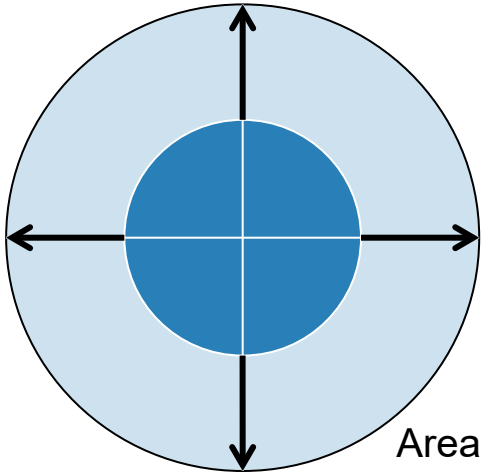
Fixed and variable costs impact place utility.



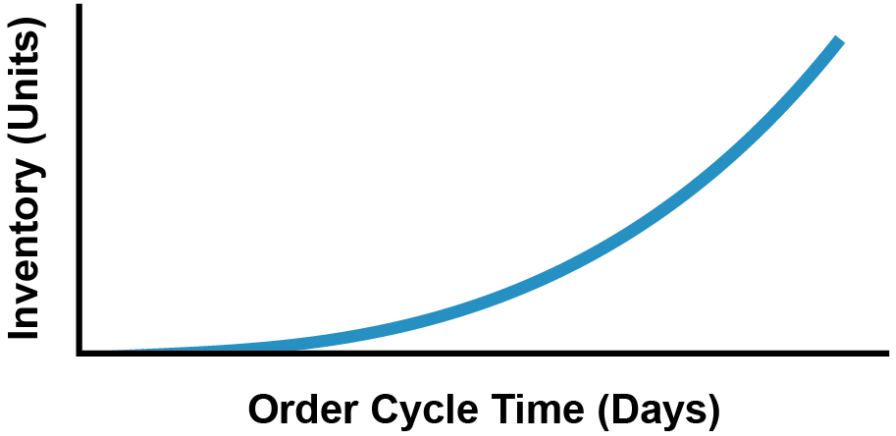
Economic Impact of Logistics

Law of squares (Lardner's law)

½ Transport Costs → Radius × 2

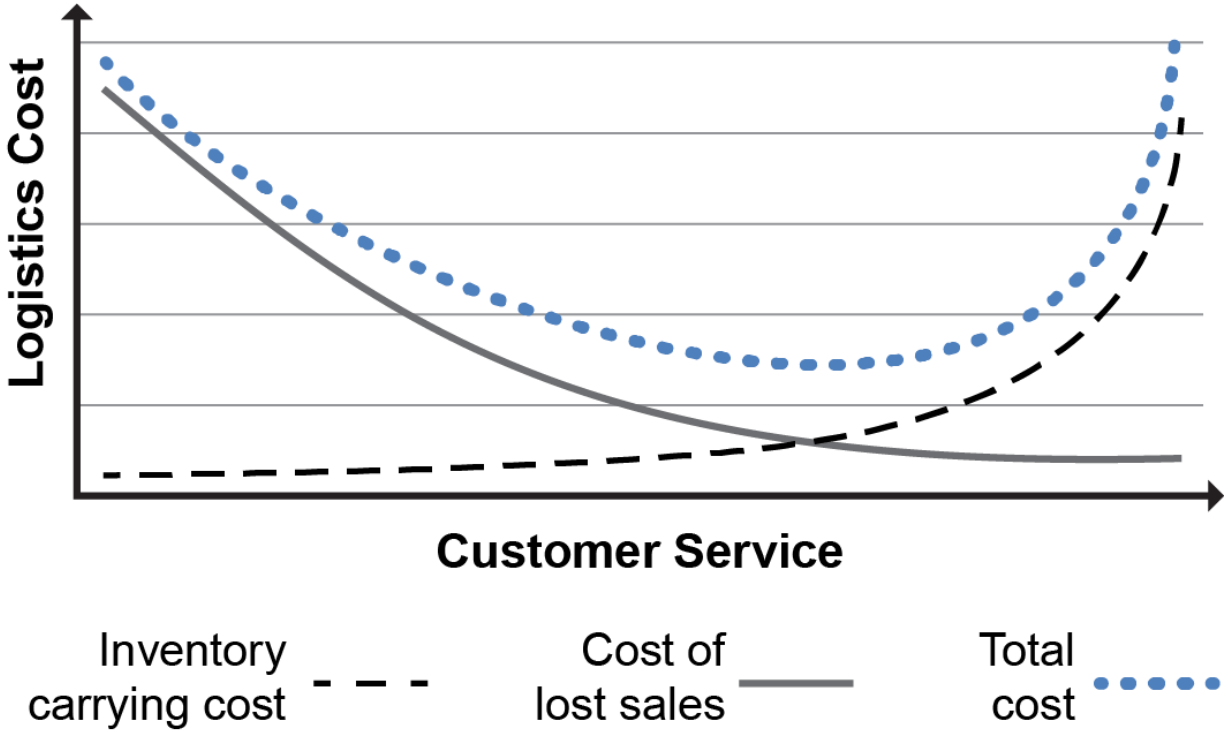


Inventory level vs. cycle time



Economic Impact of Logistics

Inventory carrying cost vs. cost of lost sales



Economic Impact of Logistics

- Transportation is largest cost area.
- Macroeconomic data obscures differentiators:
  - Logistics as percentage of sales varies by industry.
  - High vs. low performers.
  - Large firm economies of scale benefit.
- Valuable inventory.
  - Costs more.
  - Lower logistics cost as percentage of sales.
- Dense or fragile goods have upward sloping cost curves.

Economics of Supply and Demand

Comparative advantage

Analyze suppliers, producers, market proximities.

- Compare costs
  - Transportation
  - Labor
  - Warehousing
- Sourcing for strategic reasons
  - Availability of raw materials
  - Establish sales (i.e., “locally sourced”)

Spatial Relationship Competitive Analysis Example

	Local Producer	Low-Labor-Cost Producer	Cost Advantage (Local Perspective)
Production	€10/unit	€5/unit	– €5/unit
Inbound supply	€2/unit	€3/unit	€1/unit
Outbound distribution	€1/unit	€6/unit	€5/unit
Total logistics	€3/unit	€9/unit	€6/unit
Total landed	**€13/unit**	**€14/unit**	**€1/unit**

Globalization

- Global volatility
  - Supply and commodity prices
  - Demand
  - Direct sales
- Service expectations
- Buying power
- Local final assembly
- Larger containerships
- Skilled labor in low-labor-cost countries
- EU free trade zone
- Multimodal tools
- Barriers
  - Trade wars
  - Broker research
  - Culture
  - Terrorism responses
  - Infrastructure

E-commerce and Technology

E-commerce

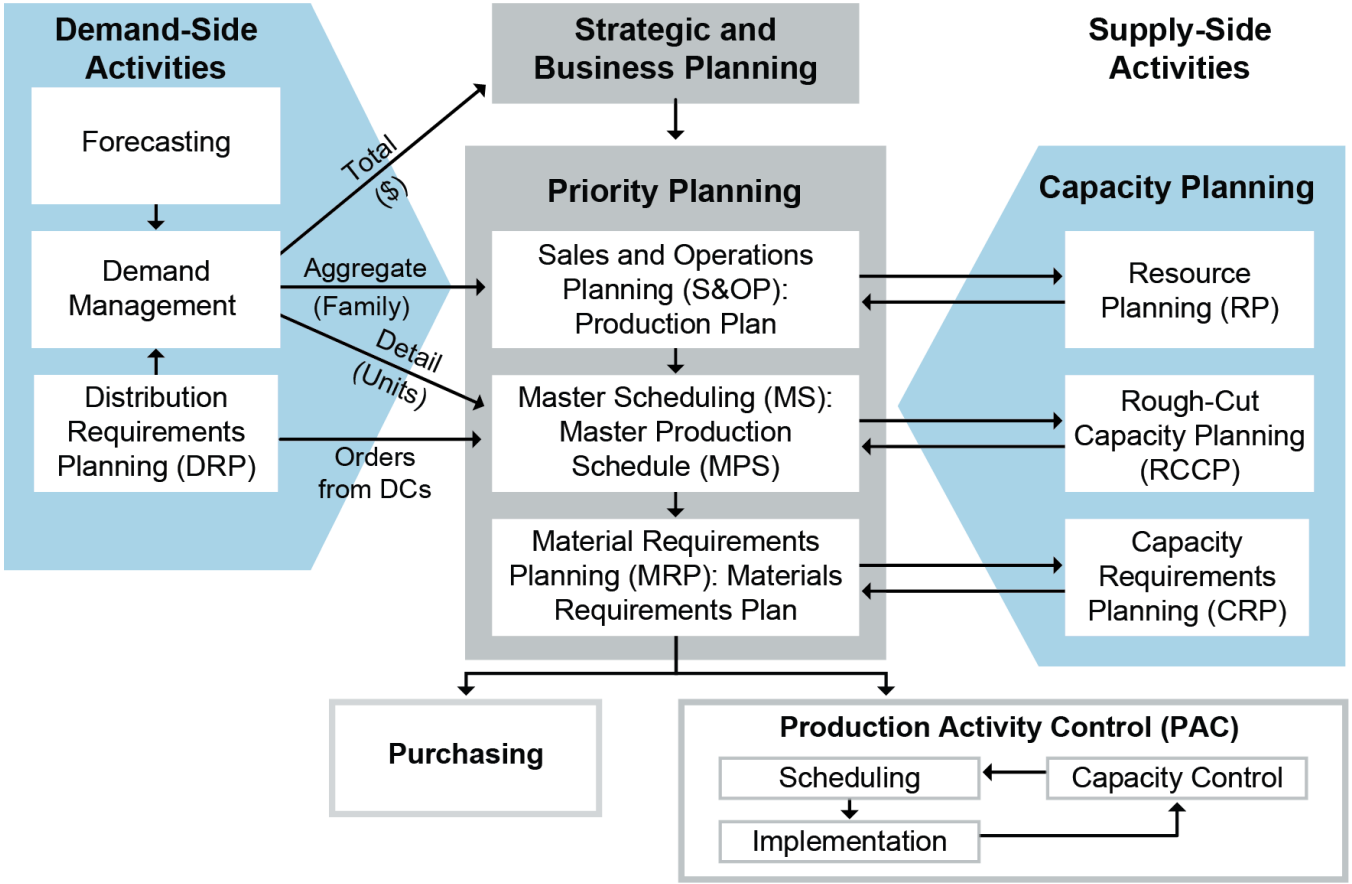
- Growth rate faster than for retail
- Market shift toward more parcel delivery
- Use retail centers for online fulfillment
- Narrow evening delivery window

Technology

- Logistics software and control systems (TMS, WMS, control towers)
- To get impact, also invest in
  - Human resources
  - Digital transformation
  - Resources

Understand Logistics in a Supply Chain Management Context

Relationship Between S&OP and Logistics/ Distribution



Sustainability and Resilience Objectives

Sustainability Objectives

- Driven by strategy
  - Charitable donations
  - Direct impact (e.g., responsible forestry)
  - Strategic impact
    - Management involved
    - Coordinated efforts
    - Proactive

Enabling Resilience

- VUCA
  - Volatility
  - Uncertainty
  - Complexity
  - Ambiguity
- Redundancy
- Flexibility

Value Through Management and Leadership

Management	Leadership: Trait Model	Leadership: Process-Based Model
▪ Monitor ▪ Control ▪ Communicate ▪ Collaborate ▪ Delegate ▪ Empower ▪ Capabilities vs. customer needs	▪ Charisma, passion, decisiveness ▪ Enough technical experience?	▪ Process improvement ▪ Delegate to right team ▪ Admit mistakes ▪ Can challenge status quo?

Discern the Value of Logistics Management

Creating Competitive Advantage

Efficiency

- Price
- Utilization
- Turnover
- Low inventory

Agility

- Ramp up or down
- Flexible volume, variety
- Value-added

Resilience

- Seamless recovery
- Diversify
- Redundant

Customer Focus

- Satisfaction
- Responsiveness
- Quality
- Complexity
- Competence

Discern the Value of Logistics Management

Increasing Customer Satisfaction

- Customer expectations:
  - Necessity: Some requirements more vital than others
  - Relative service levels offered by competitors
- Communicate:
  - Learn your customers
  - What they value
  - Set expectations at realistic level

Increasing Customer Focus: Logistics View

SCOR DS performance attributes for priority setting

- **Reliability:** 7 rights of logistics
- **Agility:** Fast time to market, short cycle times
- **Costs:** Labor, materials, management, storage, transport
- **Profit:** Sufficient revenue over expenses
- **Assets:** Utilize efficiently, optimize inventory
- **Environmental:** Impact, resource efficiency
- **Social:** Training; diversity, equity, and inclusion (DEI)

How Can a Supply Chain Increase Profits?

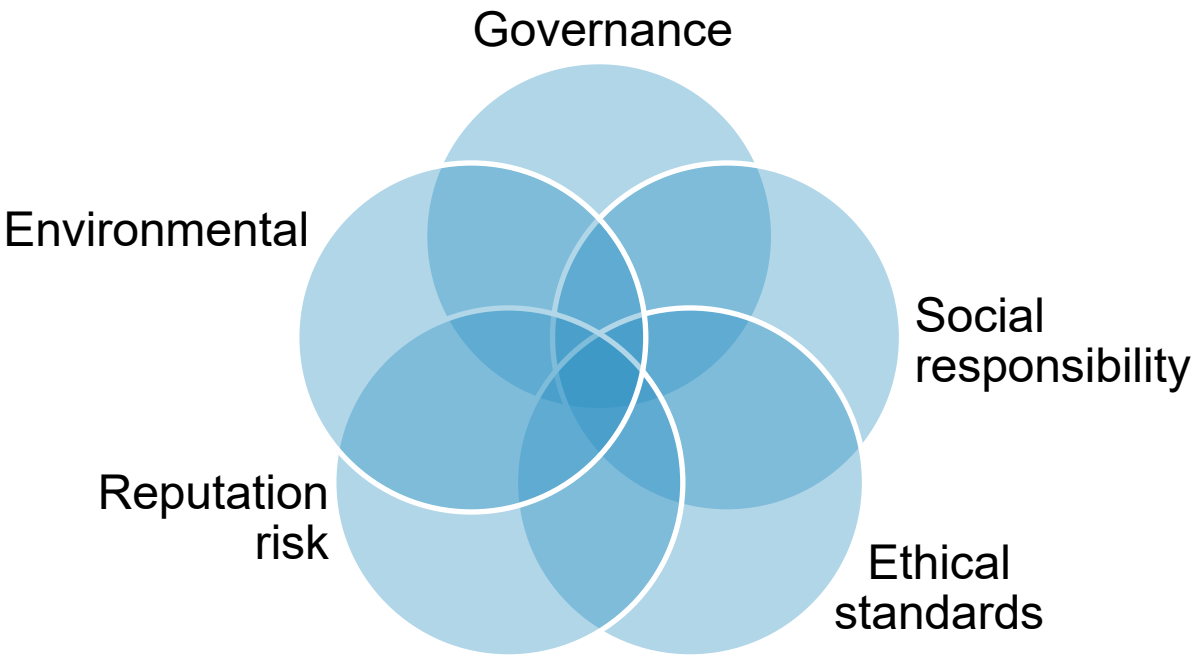
Two basic ways:

- Increase end-to-end sales revenue (throughput).
- Reduce costs.

Increasing sales also increases variable costs such as production, material, and selling costs.

Discern the Value of Logistics Management

Contributing to Environmental, Social, and Governance



Effectively Manage Logistics Costs

Traditional Cost Accounting

Logistics need: Cost to pick and pack each unit?

Traditional: Costs obscured

- Aggregated by account
- Accounts include non-logistics costs

Effectively Manage Logistics Costs

Cost Terminology

Fixed cost

Variable cost

Direct costs

(direct material, direct labor)

Indirect costs

Contribution Margin Analysis

Amounts shown in thousands USD

Warehouse Product Line Analysis				
	Product Line A	**Product Line B**	**Total**	**Eliminate Line B**
Revenue	1,000	500	1,500	1,000
- Variable Cost of Goods Sold	- 400	- 250	- 650	- 400
Variable Gross Profit	600	250	850	600
- Variable Direct Costs	- 50	- 50	- 100	- 50
Contribution Margin	550	200	750	550
- Fixed Direct Costs	- 160	- 70	- 230	- 160
Net Segment Contribution	390	130	520	390
- Indirect Fixed Costs			- 300	- 300
Net Profit			220	90
Contribution Margin Ratio	55%	40%	50%	55%
Net Segment Contribution Ratio	39%	26%	35%	39%

Cost Allocation

Cost allocation assigns all costs.

- Net profit: Segment sales volume ÷ total volume.
- May not be fair and equitable?
  - If one-third of sales, does it consume one-third of warehouse space? One-third of transportation volume?

CLTD

CERTIFIED IN LOGISTICS,
TRANSPORTATION AND DISTRIBUTION

MODULE 1, SECTION C: DEVELOP LOGISTICS STRATEGY WITHIN THE SUPPLY CHAIN

APICS

ascm

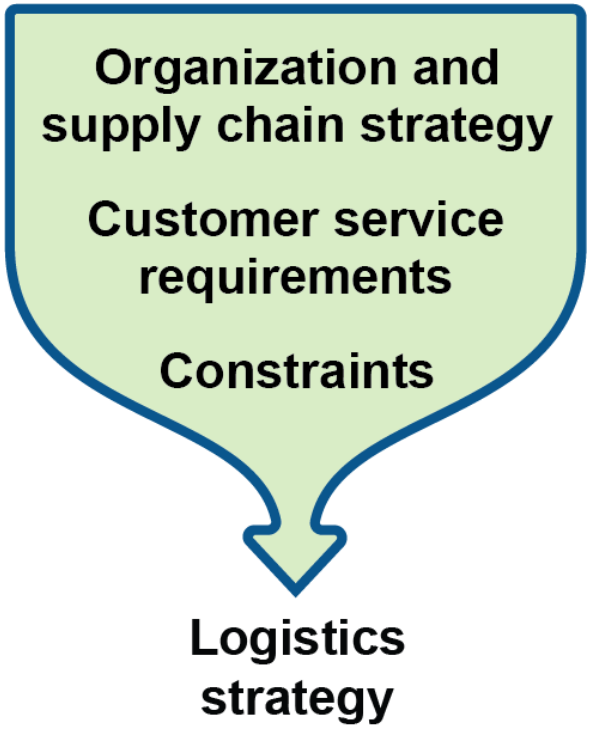
Set and Align Logistics Strategy, Goals, and Objectives

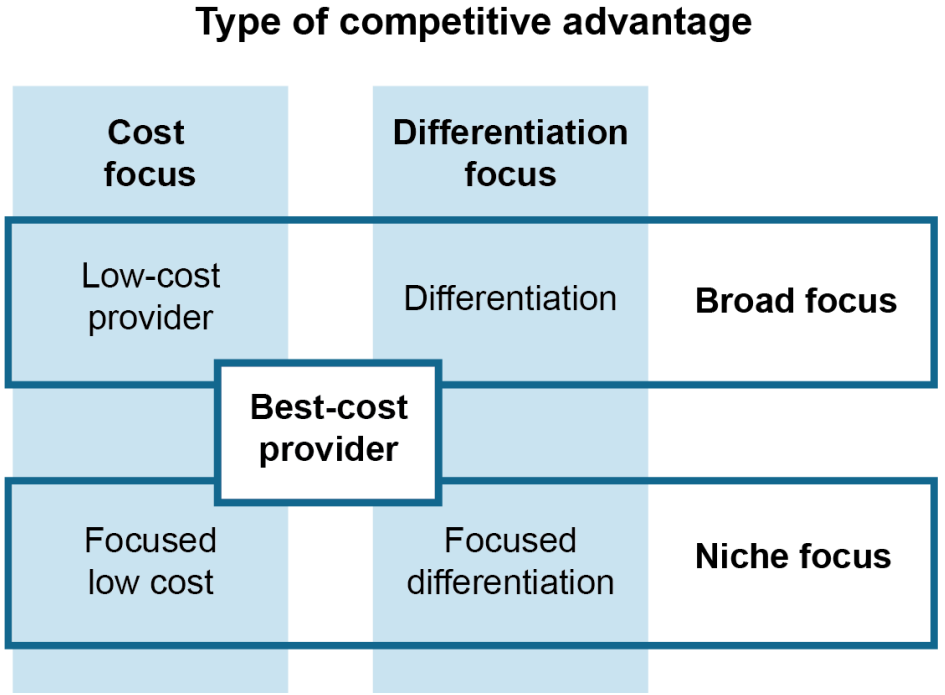
Strategic, Tactical, and Operational Plans/Controls

Level	Elements Planned or Controlled	
Strategic *Planning horizon:* 3–5 years+ *Purpose:* Planning	• Capital expenditures, operating costs • Customer service levels • Distribution channels • Supply locations • Manufacturing locations	• Warehouse network and types • Modes and delivery • Make-or-buy • Inventory
Tactical *Planning horizon:* 6–12 months *Purpose:* Planning and control	• Warehouse layout, hardware, control • Materials-handling process, equipment • Order processing	• Mode, carriers, routes, schedules • Vehicles • Metrics • Service process
Operational *Planning horizon:* Daily *Purpose:* Control	• Receiving • Storage • Pick, pack, replenish • Load planning	• Route, schedule • Personnel • Order documentation • Inventory level • Maintenance, repair

Set and Align Logistics Strategy, Goals, and Objectives

Inputs to Logistics Strategy





Set and Align Logistics Strategy, Goals, and Objectives

Logistics Goals and Objectives

Goals	Objectives (Comprehensive)	SMART
Plan to realize strategy ▪ Parties, channels add value or are eliminated	▪ Network integration ▪ Variance reduction ▪ Agility ▪ Product life cycle and reverse logistics ▪ Quality ▪ Customer service and responsiveness	Specific Measurable Attainable Relevant Time-bound

Generic Logistics Strategies

Process strategy

Market strategy

Information strategy

Value Proposition for Generic Strategies

Process strategy

- High quality at low price
- Economies of scale

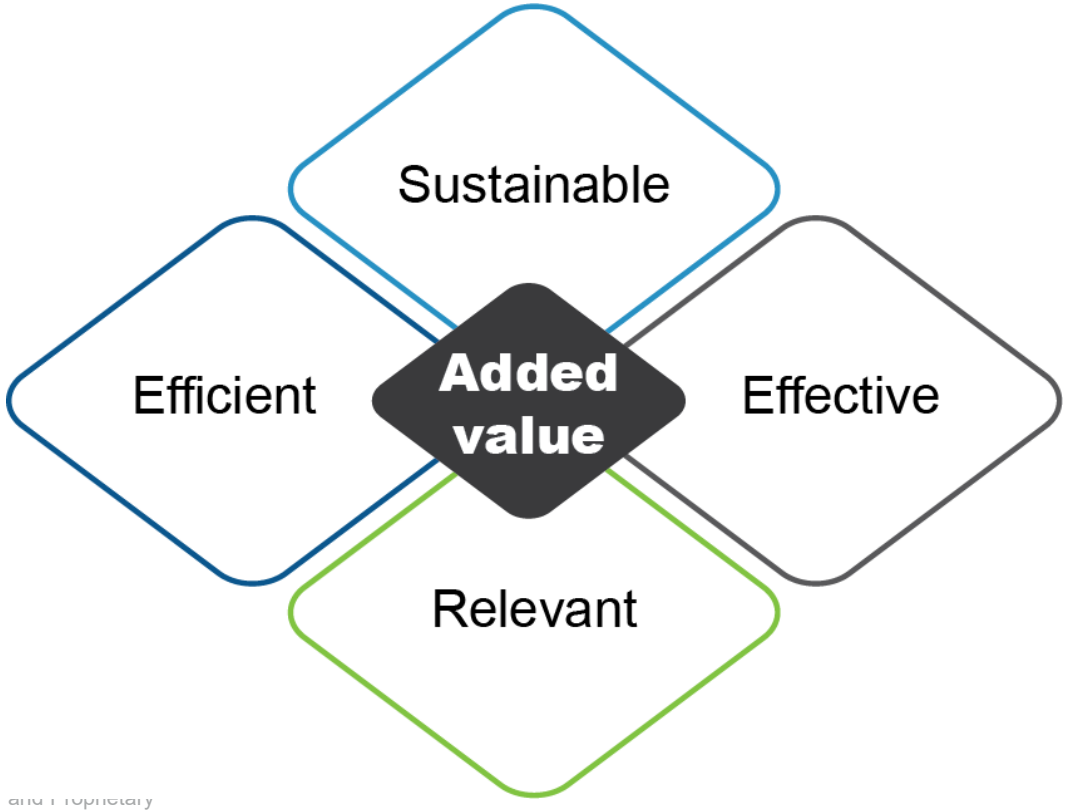
Market strategy

- Variety when and where needed
- Economies of scope

Information strategy

- Relevant to customer segment
- Integrates and sequences custom networks

EERS Value Diamond Logistics Value Proposition



Value Propositions for Logistics

Logistics Goals and Objectives	Value Proposition
Network integration	Lowest total cost at acceptable service.
Variance reduction	Shorten order cycles.
Agility	Postpone operations.
Product life cycle support	Agile to help meet variations in demand.
Reverse logistics	Proactively manage returns for profitability.
Quality	Invest in quality.
Customer service	Base logistics service to set expectations.

Optimizing Logistics: Basic Optimization Categories

Availability	Operational performance	Service reliability
▪ Faster shipping ▪ Frequent deliveries ▪ Safety stock	▪ Delivery consistency ▪ Flexibility for requests ▪ Responsiveness to changes in demand	▪ Training ▪ Performance measurement ▪ Continuous improvement ▪ Recovery, repair, and replacing lost customers

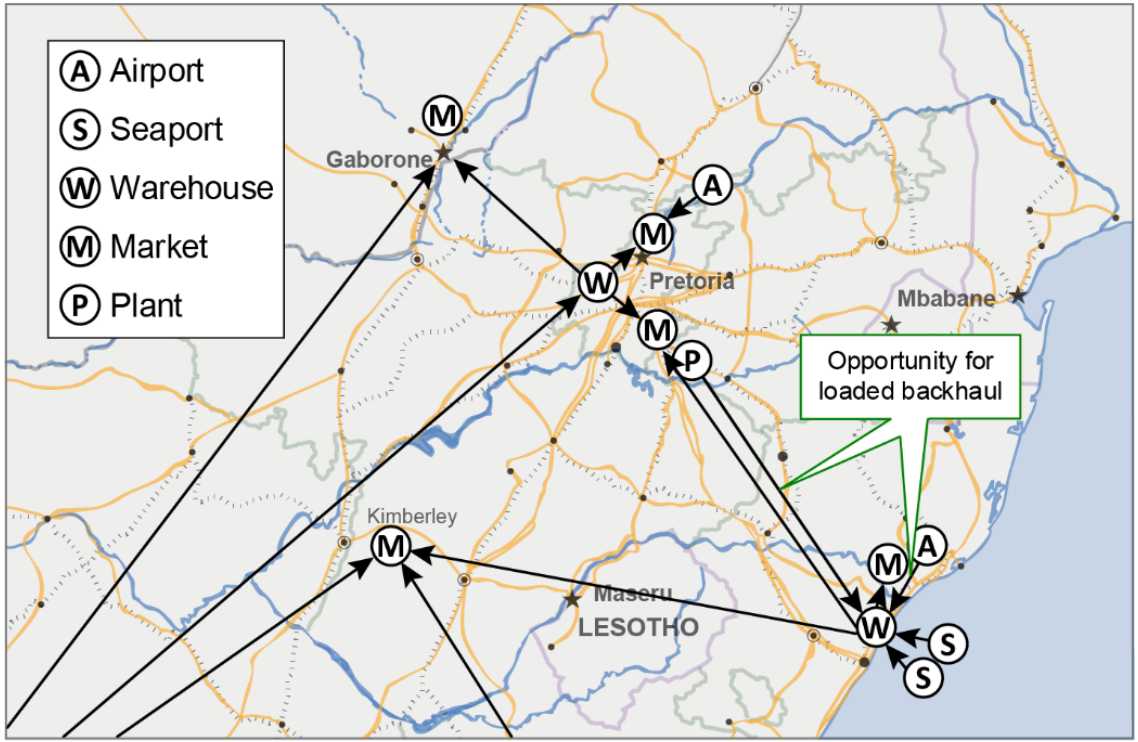
Warehousing, Inventory, and Transportation Value

- Longer line hauls, more full loads
- Shipment consolidators
- Delaying shipments to consolidate loads
- Partnering with others with same origin-destination pairings
- Long-term package service contracts
- Spot stocking
- Dwell reduction
- Demurrage charges elimination

Labor and Technology Optimization

Labor	Technology
▪ Preventive investments ▪ Empowered workforce ▪ Cross-training ▪ Worker safety measures	▪ On-demand role-based access ▪ Accurate and timely ▪ Know desired results ▪ Actual product capabilities and drawbacks ▪ Training ▪ Change management

Nodes and Links



Total Cost of Ownership (TCO)

Pre-transaction components	Identifying need and sources, suppliers; switching processes, nodes, and links
Transaction components	Purchase price, landed costs (transportation, tariffs, duties, taxes, inventory carrying costs, 3PL fees)
Post-transaction components	Life cycle, MRO, cost of quality, sustainability, customer service and reputation

TCO Supplier Comparison

Copper tubing comparison example

- What are your priorities?

CPC # PO33293	Description: 3/8" Copper Tubing Type M, 10 feet long			
Suppliers	**A (Brazil)**	**B (Korea)**	**C (China)**	**D (U.S.A)**
Landed costs				
Price per unit	USD 9.800	USD 9.600	USD 8.200	USD 11.200
Inbound transportation	1.200	1.600	1.650	0.211
Total landed costs	11.000	11.200	9.85	11.411
Life-cycle costs				
Contracting	0.200	0.200	0.200	0.200
Business unit purchasing	1.488	0.880	0.990	0.790
Logistics administration	2.120	2.570	2.100	1.110
Receiving	0.027	0.032	0.054	0.012
Inspection	0.050	0.070	0.110	0.080
Cost of internal quality	0.430	0.540	0.520	0.780
Inventory carrying	1.200	1.600	1.650	0.08
Accounts payable	0.050	0.050	0.050	0.050
Exchange rate factor	0.057	2.000	0.003	0.000
Outbound transportation	0.100	0.100	0.100	0.100
Waste disposal	0.054	0.054	0.054	0.054
Cost of external quality	0.068	0.064	0.062	0.080
Total LCC	5.844	8.160	5.893	3.336
TCO (Landed + LCC)	USD 16.844	USD 19.360	USD 15.743	USD 14.747

Make-or-Buy: Core Competency Analysis

Is the competency a core competency?

- Not if others do it better or the same for less (Seek external opinions to counter internal bias.)

Should it be a core competency?

- Need must exist

- Skills of workers and organization
- Collective learning and collaboration
- Not directly related to product or market
- Rarely good reason to contract out core competency

TCO Factors Favoring Make or Buy

Favoring “make”	Favoring “buy”
▪ Control ▪ Customer focus and responsiveness ▪ Risk management	▪ Better agility or resilience ▪ Reduced capital expenditures ▪ Focus on core competencies ▪ New ways of thinking ▪ Access to new markets ▪ Expertise/management of complexity

Make-or-Buy: Break-Even Analysis

"A study of the number of units or amount of time required to recoup an investment."

– *ASCM Supply Chain Dictionary*

Make Fixed Cost + (Make Variable Cost per Unit × Q) =
Buy Fixed Cost + (Buy Variable Cost per Unit × Q)

Q = Quantity in units

Contracting Process

1. Begin with the end in mind and document plans.
2. Analyze strategic imperatives.
3. Analyze costs and the as-is state.
4. Select providers.
5. Implement the contract.
6. Reorganize internal processes and transition staff.
7. Manage contract relationships.

Set Contracting Strategy

Step 4: Select Providers.

A. Clarify the requirements and the scope of activities.
B. Identify the type of provider being sought.
C. Locate and research potential providers.
D. Prepare an RFP or ITT or equivalent.
E. Evaluate and compare responses.
F. Select a contractor and negotiate.
G. Finalize contract and contract terms and conditions; sign contract.

Apply Segmentation

Market, Customer, and Delivery Channel Segmentation

- Market and customer segmentation
  - Sales and marketing create it and are main audience.
  - Logistics uses:
    - For least profitable: basic service
    - Other methods better for customizing logistics networks
- Delivery channel segmentation
  - Simple
  - Omni-channel

Operationalizing Market and Customer Segmentation

- Segment by supply chain delivery needs and tradeoff areas
- One-size fits all: classic error
- SCOR DS performance attributes at superior (++), advantage (+), rest at parity

Low-cost: Cost ++, assets +, reliability +

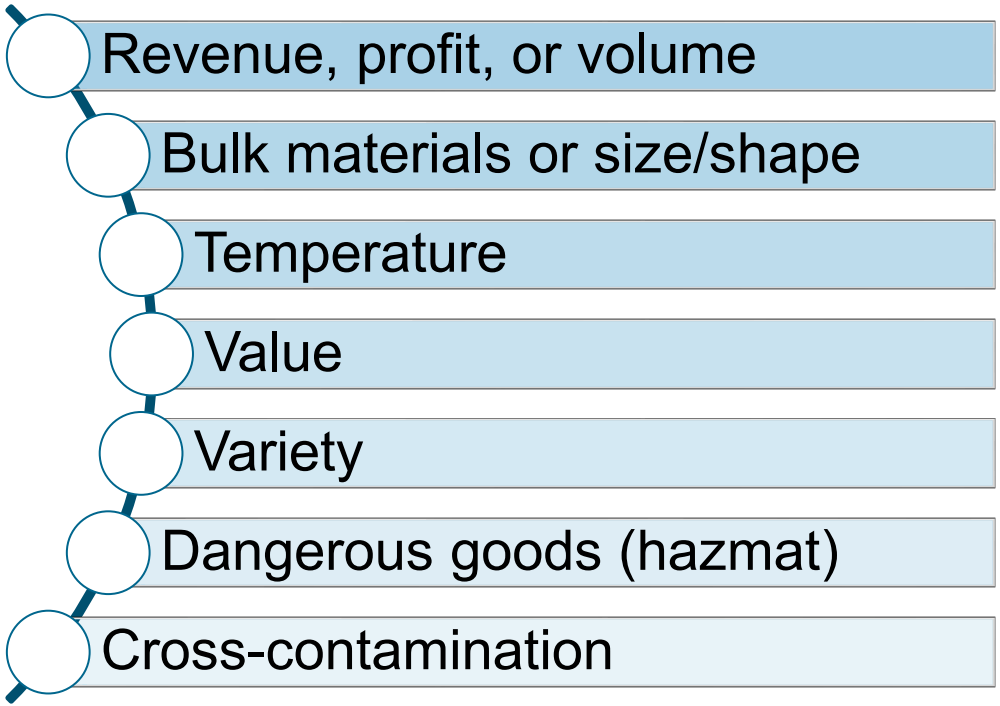
High demand variability: Agility ++, responsiveness +, reliability +

Project-driven: Reliability ++, agility +, responsiveness +

Long-term collaboration: Profit ++, reliability +

Innovative or emergency capacity: Agility ++, responsiveness +, assets +

Product Segmentation



Product Life-Cycle Management (PLM)

- Manage whole life cycle plus individual recalls etc.
- Tracing and chain-of-custody
- Efficient returns
- End-of-life requirements