Session 1

Sourcing Decisions: Optimal Procurement Policies

Faculty
Rajaram Natarajan
Ph : + 1 272 207 0016
Email :rajaram.natarajan72@outlook.com

Sourcing Decisions: Optimal Procurement Policies – Agenda

01
Role of Sourcing in a supply chain

02
Factors that affect decision making

03
Dimensions of supplier performance impacting cost

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The Procurement Iceberg
What People See
Sourcing
Negotiating
Financial updates
Administration
Logistics
Contract disputes
Risk management
Inventory control
Quality control
Finding alternative suppliers
Supplier relationship management
Contract management
Business continuity
Negotiation preparation
Supplier selection
Sustainability
Supplier certification
Logistical issues
Payment issues
Supplier development
What People Don't See
PT Procurement Tactics

Important decisions for Procurement

- In house production or Outsource
- Outsourcing – Third party performs the functions
- Dell
  - 2005 - profits increased keeping retailing in-house & selling directly to customers
  - 2007 – outsourced retailing to Wal-Mart
- Apple
  - In contrast expanded insourcing by growing retail stores
- Offshoring – supply function moved offshore even if ownership retained
- Outsourcing – Outside firm to perform operations rather than within the firm

Outsourcing based on 3 Questions

1. Will the third party increase the supply chain surplus relative to performing the activity in-house?
2. How much of the increase in surplus does the firm get to keep?
3. To what extent do risks grow upon outsourcing?

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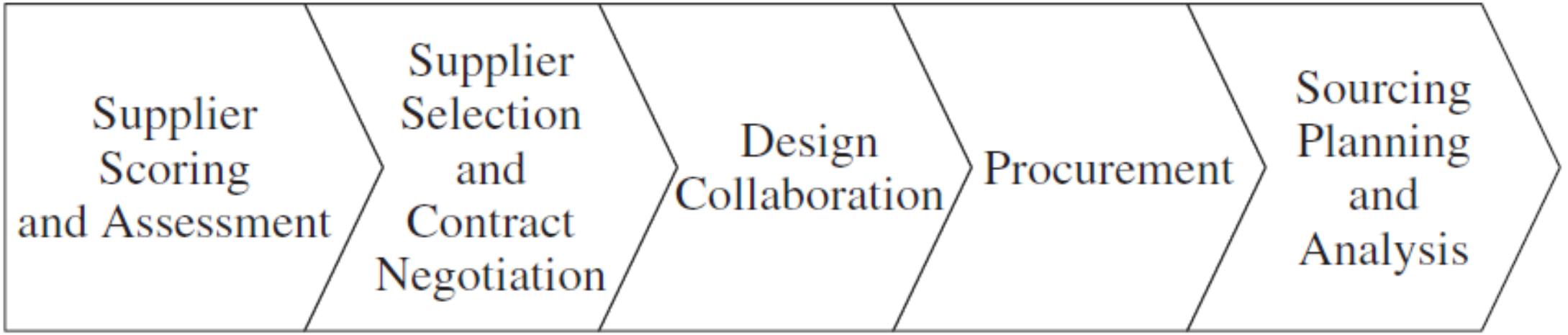
Supply chain surplus

- Outsourcing makes sense when ↑ Supply Chain Surplus
- Supply chain participant survive if presence increase supply chain surplus

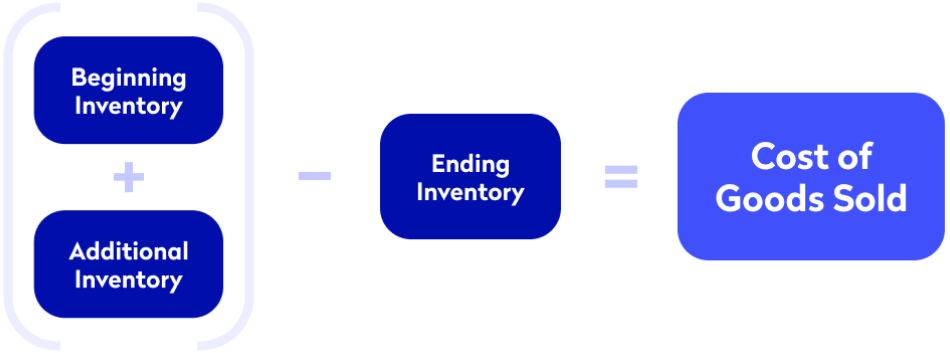
Sourcing related process



Process used to rate supplier performance - compared based on their impact on the supply chain surplus and total cost.	Uses output from supplier scoring & assessment to identify the appropriate supplier	Allows supplier & manufacturer to work together when designing components for the final product	Process whereby the supplier sends product in response to orders placed by the buyer	Analyze spending across various suppliers and component categories to identify opportunities for decreasing the total cost

COGS

- Represents well over 50 percent of sales for most major manufacturers
- Purchased parts are now a much higher fraction than earlier
- Change has occurred because companies have reduced vertical integration and outsourced the manufacture of many components
- Example - Cisco has gone further and also outsourced a significant fraction of the assembly capacity.
- Greater pressure on firms to achieve lower costs - suppliers' share of the COGS grows, good sourcing decisions will have greater impact on the cost leadership and competitive advantage enjoyed by a firm.



How do Third parties increase supplier surplus

1. Capacity Aggregation – Aggregating demand across multiple firms – economies of scale
2. Inventory Aggregation
3. Transportation aggregation by transportation intermediaries
4. Transportation aggregation by storage intermediaries
5. Warehouse aggregation

How do Third parties increase supplier surplus

6 Procurement Aggregation

7 Information Aggregation

8 Relationship Aggregation

9 Recievables Aggregation

10 Lower cost and higher quality

Risks of using a third party

- Process is broken
- Underestimation of cost of coordination
- Reduced customer/supplier contact
- Loss of internal capability and growth in third party power
- Leakage of sensitive data and information
- Ineffective contracts
- Loss of supply chain visibility
- Negative reputational impact

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Services provided by 3 PLs

Service Category	Basic Service	Some Specific Value-Added Services
Transportation	Inbound, outbound by ship, truck, rail, air	Tendering, track/trace, mode conversion, dispatch, freight pay, contract management
Warehousing	Storage, facilities management	Cross-dock, in-transit merge, pool distribution across firms, pick/pack, kitting, inventory control, labeling, order fulfillment, home delivery of catalog orders
Information technology	Provide and maintain advanced information/computer systems	Transportation management systems, warehousing management, network modeling and site selection, freight bill payment, automated broker interfaces, end-to-end matching, forecasting, EDI, worldwide track and trace, global visibility
Reverse logistics	Handle reverse flows	Recycling, used-asset disposition, customer returns, returnable container management, repair/refurbish
Other 3PL services		Brokering, freight forwarding, purchase-order management, order taking, loss and damage claims, freight bill audits, consulting, time-definite delivery
International		Customs brokering, port services, export crating, consolidation
Special skills/handling		Hazardous materials, temperature controlled, package/parcel delivery, food-grade facilities/equipment, bulk

Total cost to assess suppliers

- Do you only consider price ?
- Trends include exchange rates, local inflation in material and labor cost, transportation costs, and tariffs.
- The lower transportation distance further increases the attractiveness of local suppliers from an environmental perspective.

Factors affecting Total Cost & Supplier Performance

Performance Category	Category Components	Quantifiable?
Supplier price	Labor, material, overhead, local taxes, and compliance costs	Yes
Supplier terms	Net payment terms, delivery frequency, minimum lot size, quantity discounts	Yes
Delivery costs	All transportation costs from source to destination, packaging costs	Yes
Inventory costs	Supplier inventory, including raw material, in process and finished goods, in-transit inventory, finished goods inventory in supply chain	Yes
Warehousing cost	Warehousing and material handling costs to support additional inventory	Yes
Quality costs	Cost of inspection, rework, product returns	Yes
Reputation	Reputation impact of quality problems	No
Other costs	Exchange rate trends, taxes, duties	Yes
Support	Management overhead and administrative support	Difficult
Supplier capabilities	Replenishment lead time, on-time performance, flexibility, information coordination capability, design coordination capability, supplier viability	To some extent

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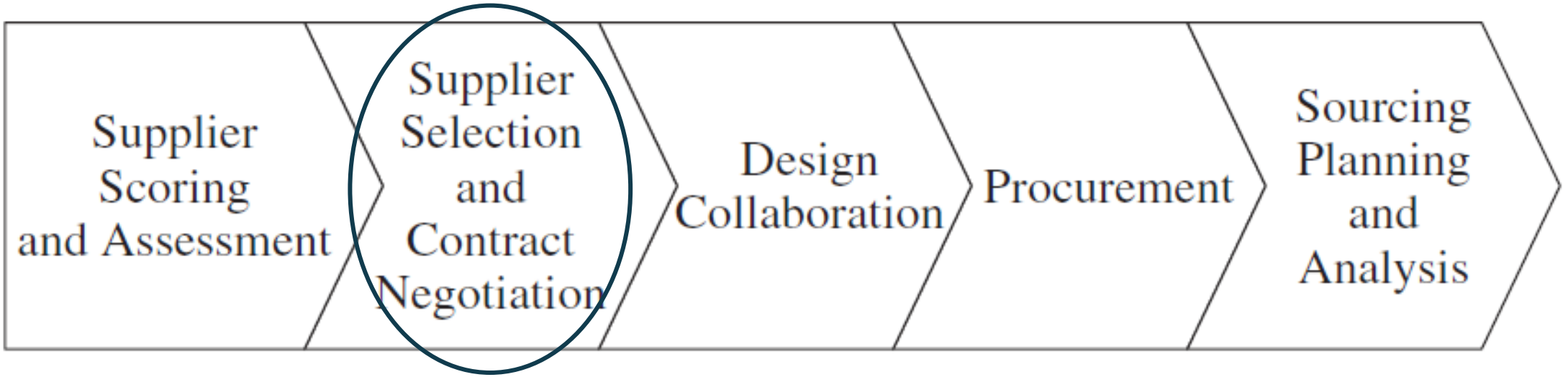
Sourcing related process



Single sourcing or multiple suppliers

- Single sourcing guarantees supplier sufficient business – if supplier make a significant buyer-specific investment ex - plant & equipment for part specific or expertise to be developed.
- Single sourcing - automotive industry parts - seats that must arrive in the sequence of production. Coordinating sequencing impossible multiple sources
- Multiple sources - degree of competition - lowers risk by providing a backup should a source fail to deliver
- Good test for No. of suppliers - analyze impact of deleting or adding a supplier
- In contrast, unless adding a supplier with a unique and valuable capability clearly adds to total cost, the supply base may be too small.
- The selection of suppliers various mechanisms, competitive bids, reverse auctions, or direct negotiations.
- Supplier selection should be based on the total cost of using a supplier and not just the purchase price.

Basic Principles of Negotiation

- Value by Buyer – Value by supplier = Positive Outcome
- Positive outcome should be >=0
- Value by buyer – dependent on cost doing this inhouse vs price from supplier
- Successful outcome is win win –
- Is 50-50 win win ?
- Buyer does not care just about price but responsiveness and quality as well
- Supplier may not reduce price but increase responsiveness or quality or both

Total Cost and Supplier Performance

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Session 2

Sourcing Decisions: Optimal Procurement Policies

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01 Types of contracts

02 Procurement

03 Tailored Sourcing

Types of Contracts

1. Buyback or returns contracts
2. Revenue-sharing contracts
3. Quantity flexibility contracts

Buyback or returns contracts

Manufacturers use buyback contracts to increase their own profits & total supply chain profits. Buybacks encourage retailers to increase the level of product availability.

- Permits retailer to return unsold inventory up to a specified amount at an agreed upon price
- Manufacturer specifies a wholesale price A and a buy back price B for which retailer can return unsold inventory

Table 15-4 Order Sizes and Profits in Music Supply Chain Under Different Buyback Contracts

Wholesale Price *c*	Buyback Price *b*	Optimal Order Size for Music Store	Expected Profit for Music Store	Expected Returns to Supplier	Expected Profit for Supplier	Expected Supply Chain Profit
$5	$0	1,000	$3,803	120	$4,000	$7,803
$5	$2	1,096	$4,090	174	$4,035	$8,125
$5	$3	1,170	$4,286	223	$4,009	$8,295
$6	$0	924	$2,841	86	$4,620	$7,461
$6	$2	1,000	$3,043	120	$4,761	$7,804
$6	$4	1,129	$3,346	195	$4,865	$8,211
$7	$0	843	$1,957	57	$5,056	$7,013
$7	$4	1,000	$2,282	120	$5,521	$7,803
$7	$6	1,202	$2,619	247	$5,732	$8,351

Buy Back clause

- Downside – Surplus inventory that needs to be salvaged or disposed
- Cost of returns can be eliminated – manufacturer gives retailer markdown allowance allowing them to sell at a significant discount

Revenue-sharing contracts

- Revenue-sharing contracts are best suited for products with low variable cost and a high cost of return.
- Revenue-sharing contracts counter double marginalization by decreasing the cost per unit charged to the retailer, thus effectively decreasing the cost of overstocking.
- Revenue-sharing contracts increase information distortion and lead to a lower retailer effort in case of overstocking, just as buyback contracts do.

Table 15-5 Order Sizes and Profits in Music Supply Chain Under Different Revenue-Sharing Contracts

Wholesale Price c	Revenue-Sharing Fraction f	Optimal Order Size for Music Store	Expected Overstock at Music Store	Expected Profit for Music Store	Expected Profit for Supplier	Expected Supply Chain Profit
$1	0.30	1,320	342	$5,526	$2,934	$8,460
$1	0.45	1,273	302	$4,064	$4,367	$8,431
$1	0.60	1,202	247	$2,619	$5,732	$8,350
$2	0.30	1,170	223	$4,286	$4,009	$8,295
$2	0.45	1,105	179	$2,881	$5,269	$8,150
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$2	0.45	1,105	179	$2,881	$5,269	$8,150
$2	0.60	1,000	120	$1,521	$6,282	$7,803

Both manufacturer & retailer increase their profits

Revenue Sharing vs Buy Back

- No returns – eliminating cost of returns
- Suited for products with low variable cost and high cost of return
- Requires information infrastructure for supplier to monitor retailer

. Quantity flexibility contracts

- Manufacturer permits retailer to change quantity ordered within limits after observing demand
- Retailer orders O units
- Manufacturer commits to providing
  - $Q = (1+\alpha)O$ units
- Retailer committed to at the minimum
  - $q=(1-\beta)O$ units
  - α and β are between 0 and 1
- Increases average amount retailer purchases and may result in total supply chain profits if structured properly

Table 15-6 Profits at Music Supply Chain Under Different Quantity Flexibility Contracts

α	β	Wholesale Price c	Order Size O	Expected Purchase by Retailer	Expected Sale by Retailer	Expected Profits for Retailer	Expected Profits for Supplier	Expected Supply Chain Profit
0.00	0.00	$5	1,000	1,000	880	$3,803	$4,000	$7,803
0.05	0.05	$5	1,017	1,014	966	$4,038	$4,004	$8,416
0.20	0.20	$5	1,047	1,023	967	$4,558	$3,858	$8,416
0.00	0.00	$6	924	924	838	$2,841	$4,620	$7,461
0.20	0.20	$6	1,000	1,000	955	$3,547	$4,800	$8,347
0.30	0.30	$6	1,021	1,006	979	$3,752	$4,711	$8,463
0.00	0.00	$7	843	843	786	$1,957	$5,056	$7,013
0.20	0.20	$7	947	972	936	$2,560	$5,666	$8,226
0.40	0.40	$7	1,000	1,000	987	$2,873	$5,600	$8,473

Order size O = 1017

Q= (1+0.05)1017 = 1067 units

q=(1-0.05)1017 = 966 units

Relative to others

- Multiple suppliers
  - Buy back contract – supply chain must produce based on retailer orders before demand arises – leading to surplus demand disaggregated at each supplier
  - Quantity flexibility contract – Range exists – Demand at various suppliers could be different – Supplier can aggregate and does not need to produce at high end for each retailer – Uncertainty can be aggregated

Procurement

Components used to make finished goods

Support operations of a firm – goods or services

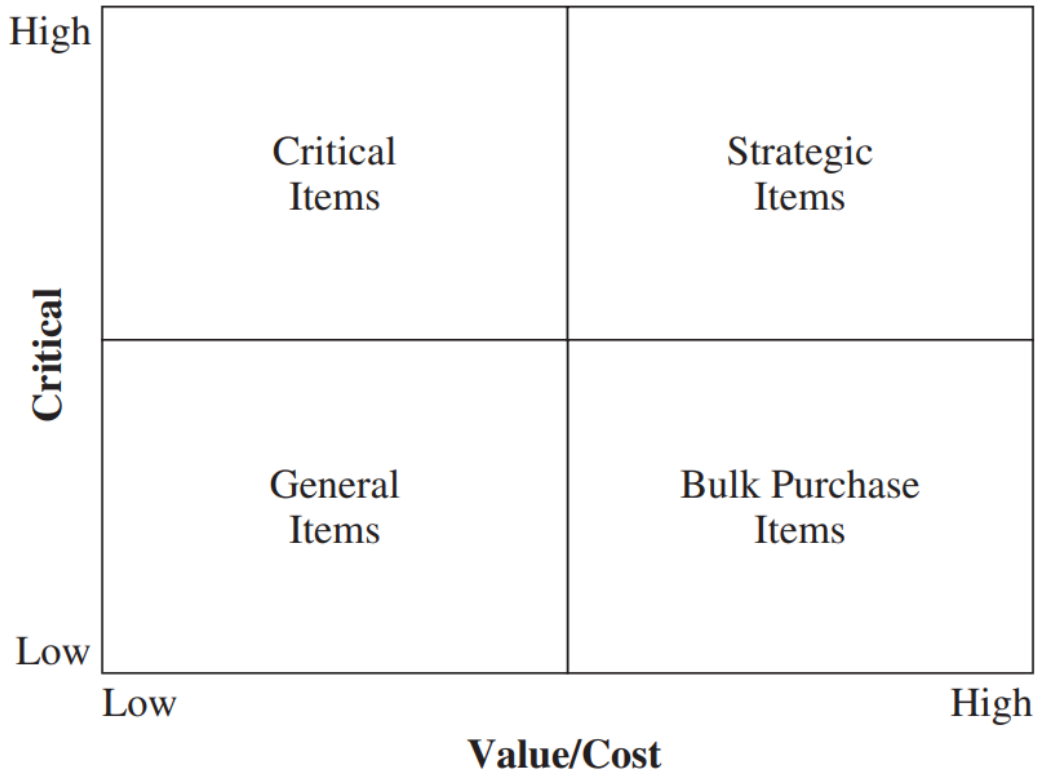
Table 15-7 Differences Between Direct and Indirect Materials

	Direct Materials	Indirect Materials
Use	Production	Maintenance, repair, and support operations
Accounting	Cost of goods sold	Selling, general, and administrative expenses (SG&A)
Impact on production	Any delay will delay production	Less direct impact
Processing cost relative to value of transaction	Low	High
Number of transactions	Low	High

Procurement goal – lower cost of acquisition or transaction cost

Direct materials could be critical, strategic or bulk purchase

Long lead times and specialty chemicals – Procurement focus on coordination of production plans



Long term relationship key here

Indirect materials are usually general items

Packing materials or bulk chemicals – Seller focus on selling price – Procurement needs to see value

Tailored sourcing – Onshoring/ Outsourcing or Offshoring

Table 15-8 Factors Favoring Selection of a Responsive or Low-Cost Source

	Responsive Source	Low-Cost Source
Product life cycle	Early phase	Mature phase
Demand volatility	High	Low
Demand volume	Low	High
Product value	High	Low
Rate of product obsolescence	High	Low
Desired quality	High	Low to medium
Engineering / design support	High	Low

Tailored sourcing – Onshoring/ Outsourcing or Offshoring

Table 15-9 Factors Favoring Onshoring, Near-shoring, or Offshoring

	Onshore	Near-shore	Offshore
Rate of innovation/product variety	High	Medium to High	Low
Demand volatility	High	Medium to High	Low
Labor content	Low	Medium to High	High
Volume or weight-to-value ratio	High	High	Low
Impact of supply chain disruption	High	Medium to High	Low
Inventory costs	High	Medium to High	Low
Engineering/management support	High	High	Low

Discussions

- How do firms like Walmart benefit from good sourcing decisions ?
- How can a supplier with a lower price end up costing more than a supplier with a higher price ?
- Consumer electronics industry assembly performed by third parties compared to auto industry mostly never outsourced - Discuss

Questions