Modern Procurement

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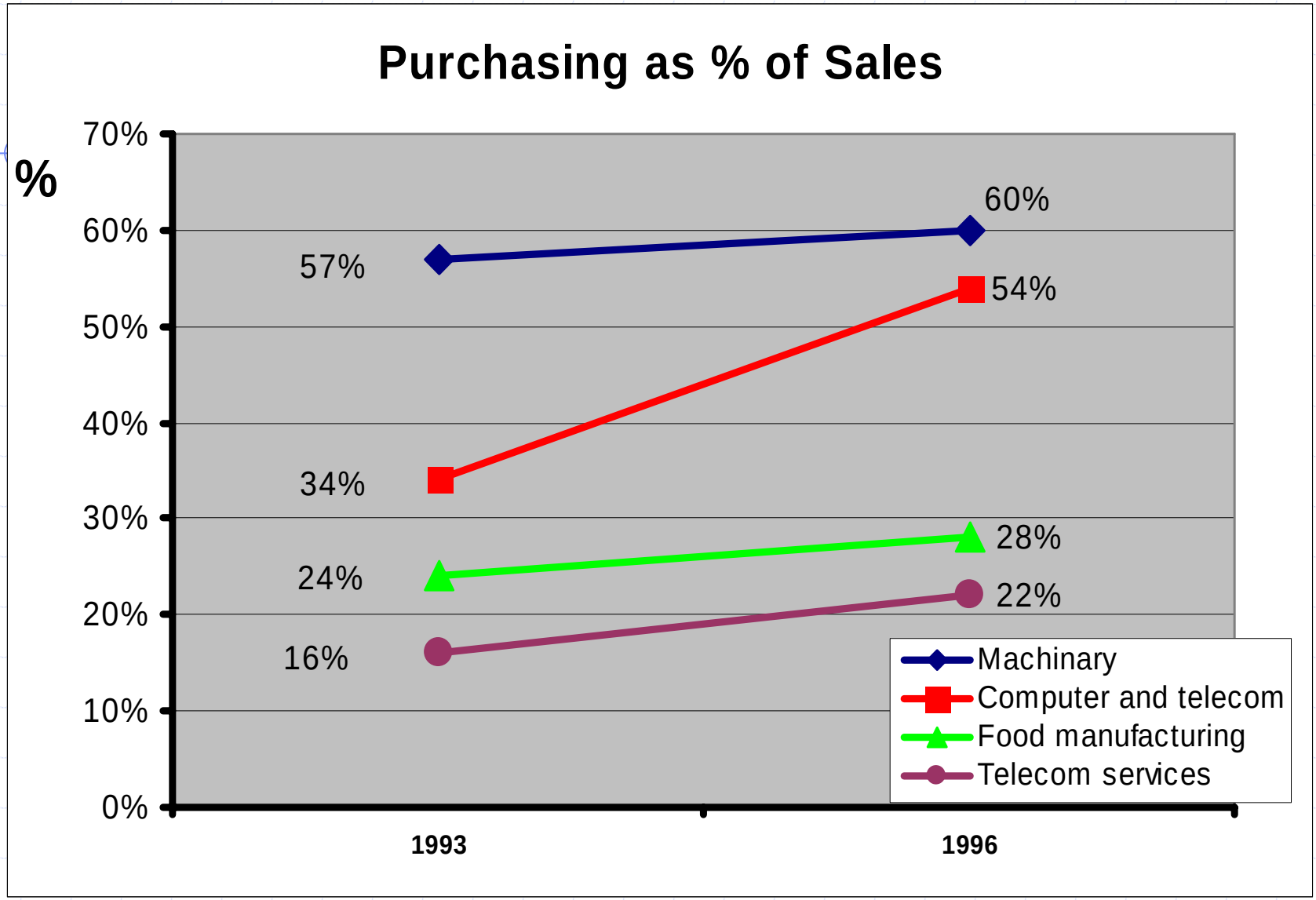
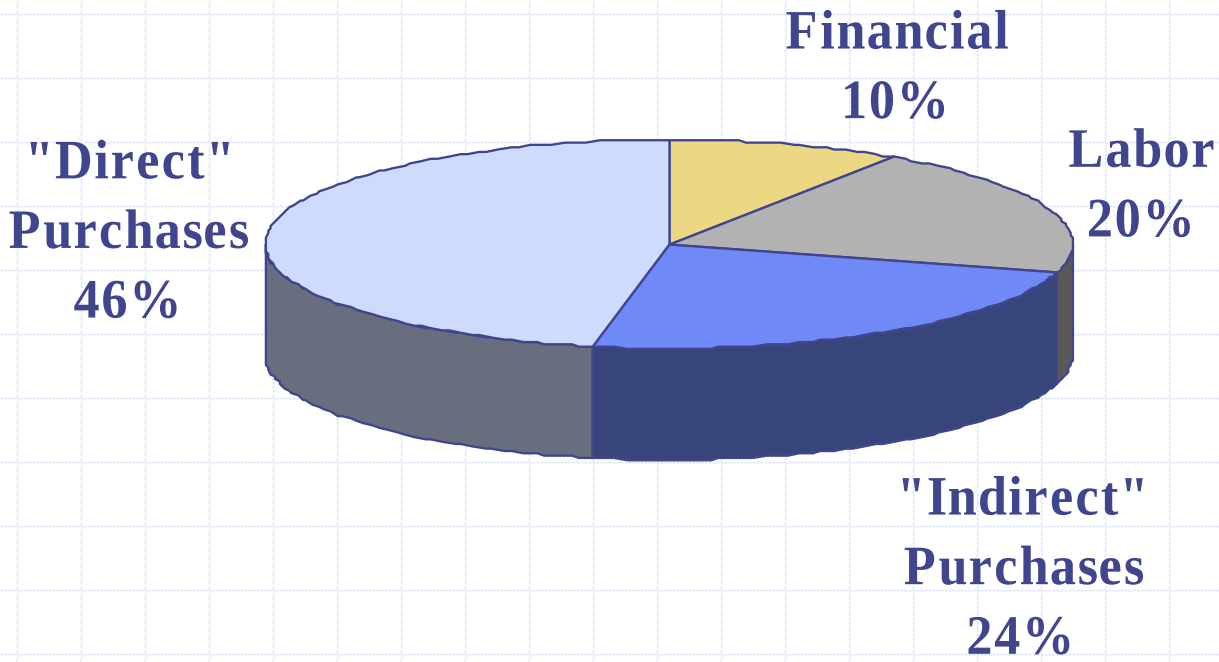
ESD.260J/1.260J/15.770J

Outline

- Role of procurement
- “Make vs. buy”
- Strategic considerations
- Case study: IBM
- Combinatorial procurement
- Case Study: Rite Aid


Purchasing as % of Sales
%
70%
60%
50%
40%
30%
20%
10%
0%
57%
60%
34%
54%
24%
28%
16%
22%
1993
1996
Machinary
Computer and telecom
Food manufacturing
Telecom services

Components of US Corporate Purchases



The Leverage

Strategic sourcing efforts can have a significant impact on the financial performance and shareholder value of a company

ILLUSTRATIVE EXAMPLE

Percent cost reduction in Direct Materials →

	Baseline	5%	10%	15%
Revenue	$1,000M	$1,000M	$1,000M	$1,000M
COGS - Material	390M	371M	351M	332M
Labor & OH	275M	275M	275M	275M
Gross Margin	$335M	$354M	$374M	$393M
Operating Expenses	200M	200M	200M	200M
Net Income (pretax)	$135M	$154M	$174M	$193M
% Improvement		14%	29%	43%

"When the goal is boosting profits by dramatically lowering costs, a business should look first to what it buys."

Fortune, February 20, 1995

The Leverage

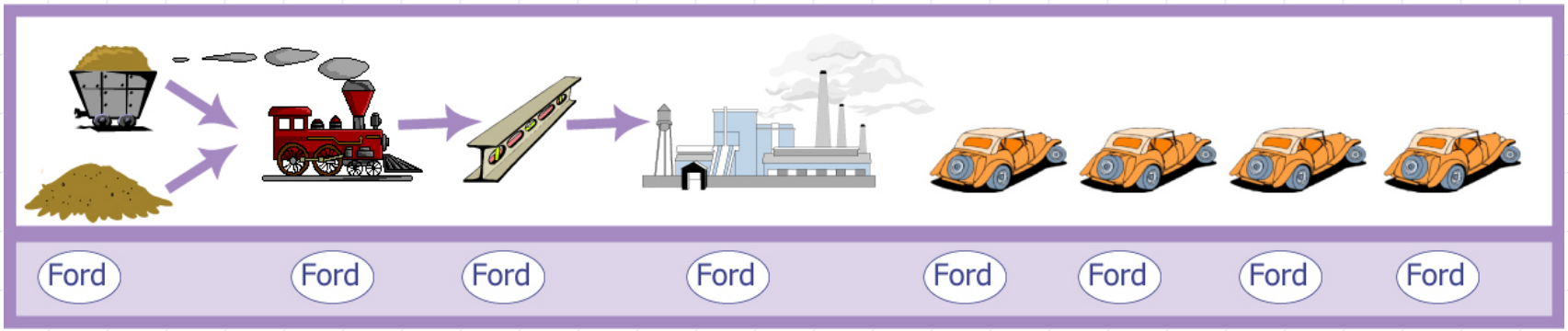
Required cost reduction to achieve 20% increase in profitability:

Industry	Purchasing	Manufacturing
Computer	1%	5%
Electrical Equipment	3%	11%
Automotive	1%	4%
Electronics	2%	6%

The Decisions:

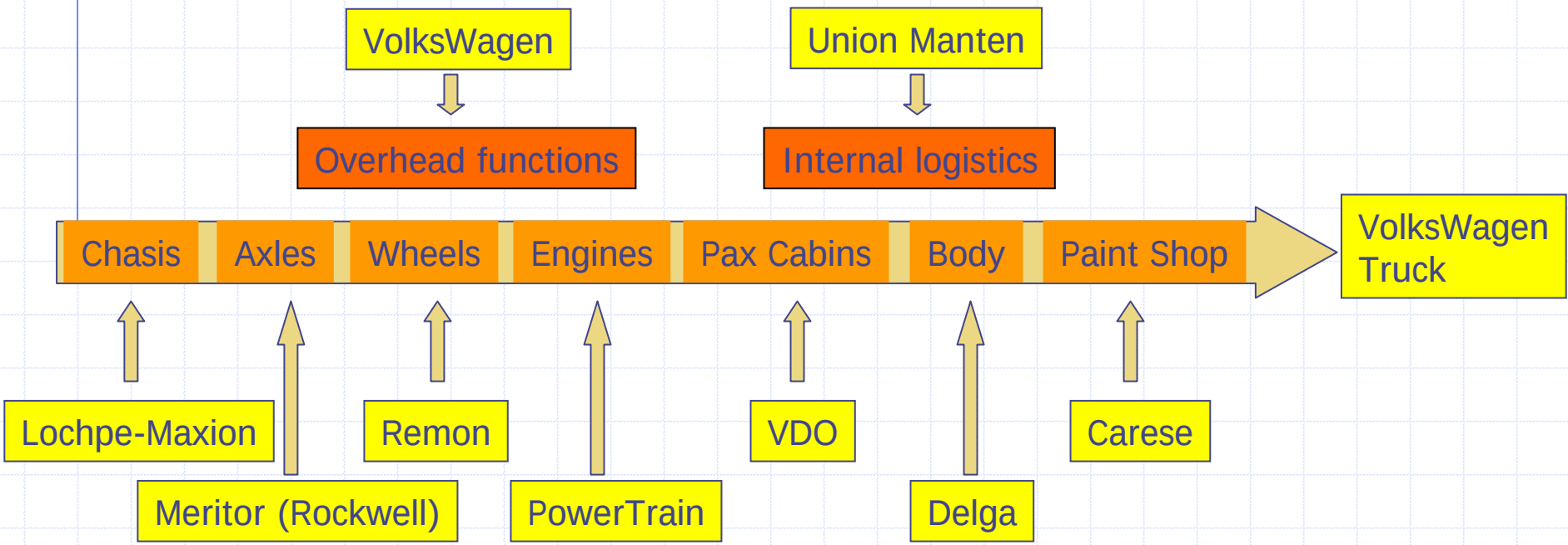
“Make” vs. “Buy”

From River Rouge to Resende



“Make” vs. “Buy”

From River Rouge to Resende



Advantages of Outsourcing

Problems with Outsourcing

The Strategic Risk

- Creating a competitor
  - 1914 – The Dodge Brothers turn from a Ford engine supplier to a competitor
  - Japanese consumer electronic industry – started with contracting for US firms for radio receivers (also adopted transistors faster)
  - Japanese aircraft industries?
- Losing control of the channel to a supplier
  - IBM in 1980 designed the PC, the manufacturing process and the value chain
  - Contracted to Microsoft and Intel
  - “Window Machine” and “Intel Inside”
- Losing control of the channel to a customer
  - P&G and Wal-Mart => “Wal-Mart Outside”?

The New Balance Story

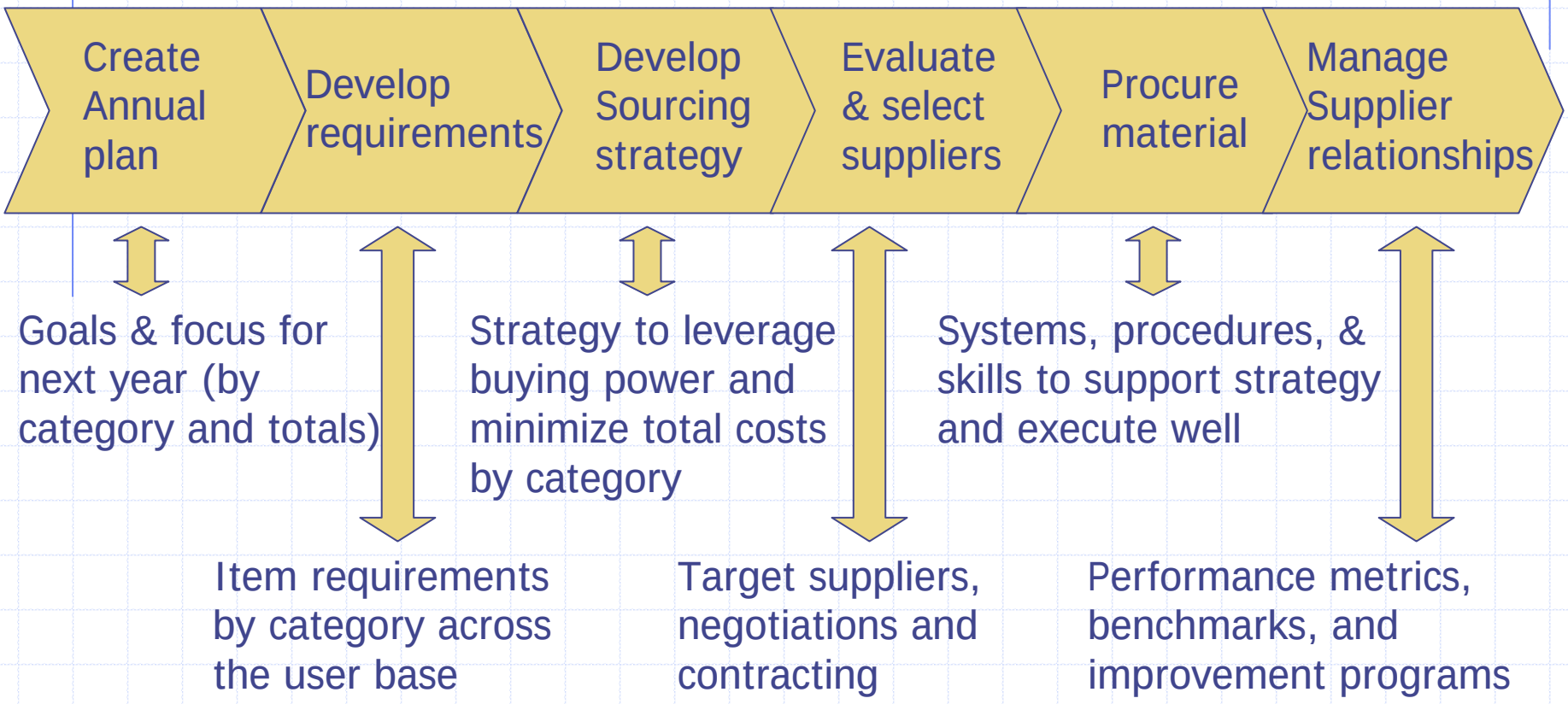
- A long term supplier – Horace Chang – went into business for itself
- Selling NB shoes at 1/3 the wholesale price
  - Making "bottom of the line" model and flooding the market 1st in China and then worldwide
  - Robbing NB of revenue
  - Damaging the brand association with high-performance athletic shoes
- Actions:
  - China's Administration for Industry and Commerce (AIC) agreed to raid five factories in 2000 netting 100,000 shoes
  - Dec 2000 filed suit in Shenzhen. Feb 2002 a judge rules against NB.
- NB is appealing

Wall Street Journal, 12/19/02

Example: Ford CT20 Project

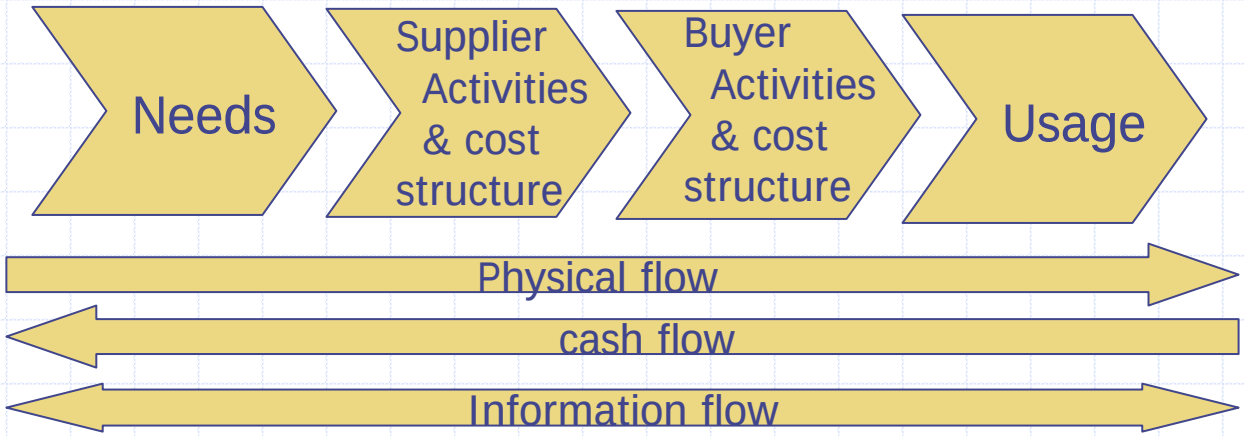
- Ford owned 25% of Mazda and had long relationships with them (including the 1988 Probe and Festiva)
- In early 1990 Ford outsourced product development and relied on manufacturing help for the CT20 (platforms for the Ford Escort and mercury Tracer)
- Steps to limit exposure:
  - Joint efforts limited to subcompact and compact only (Mazda's strong suit and Ford's weakest). Based on the 323 platform
  - Ford staff was on site in Hiroshima to learn and trasnfer knowledge
  - Two manufacturing plants: heavy involvement of Mazda in the Hermosillo, Mexico plant; another plant in Wayne, Michigan
  - Later the Wayne plant modified its processes based on the Hermosillo experience

Sourcing Process



The Total System Cost View

- Purchase price
- Supplier economics
- Supply chain costs (e.g., transportation, carrying inventory)
- Buyer's cost of acquiring and managing products and services
- Quality and reliability of product/service over the lifetime of the contract
- Value of product/service to internal/external customer



MARKS & SPENCER

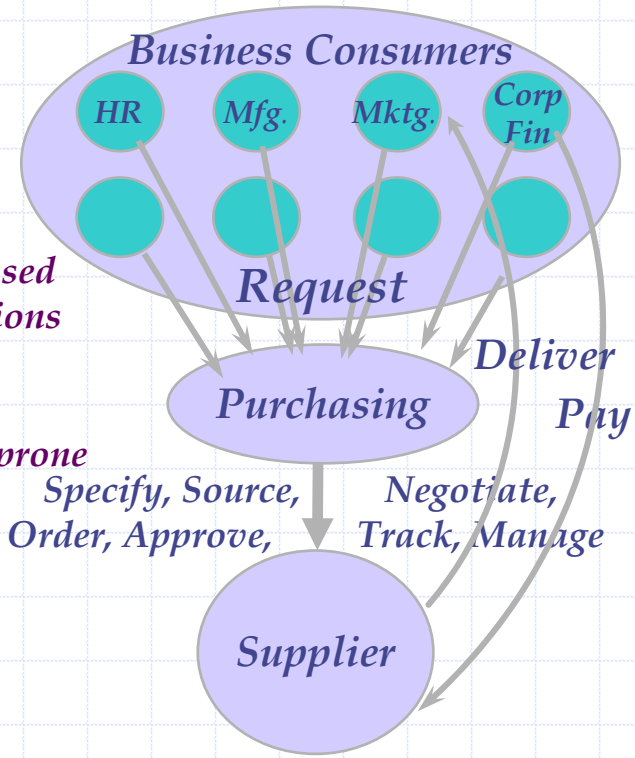
Complete Cost Consideration

- Starting in ’98 moved purchasing overseas
- Severed relationships with long time suppliers who would not agree to procure in the Far East

e-Procurement

e-Procurement relies upon direct process linkages between business consumers and suppliers.

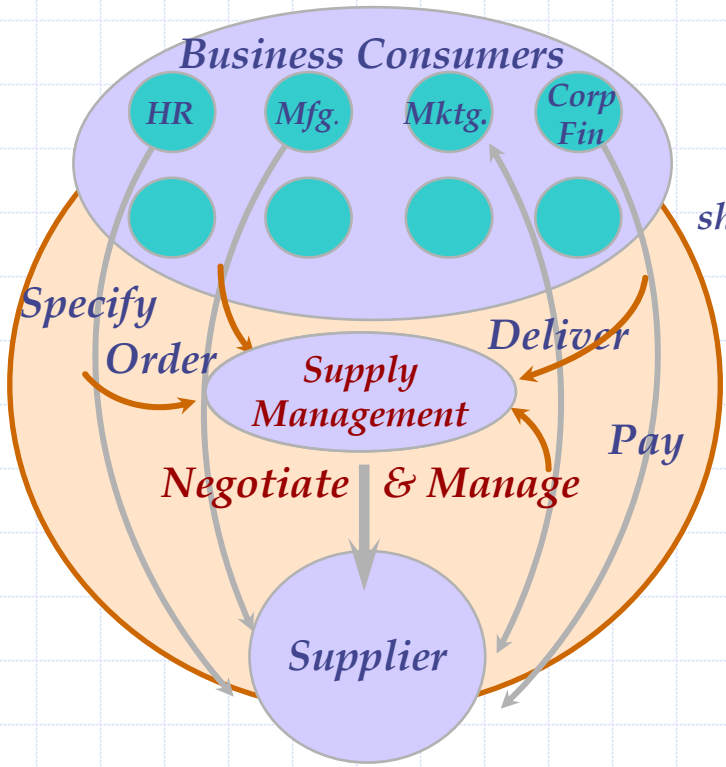
Traditional Procurement



Paper-based transactions

- *costly*
- *slow*
- *error-prone*

eProcurement

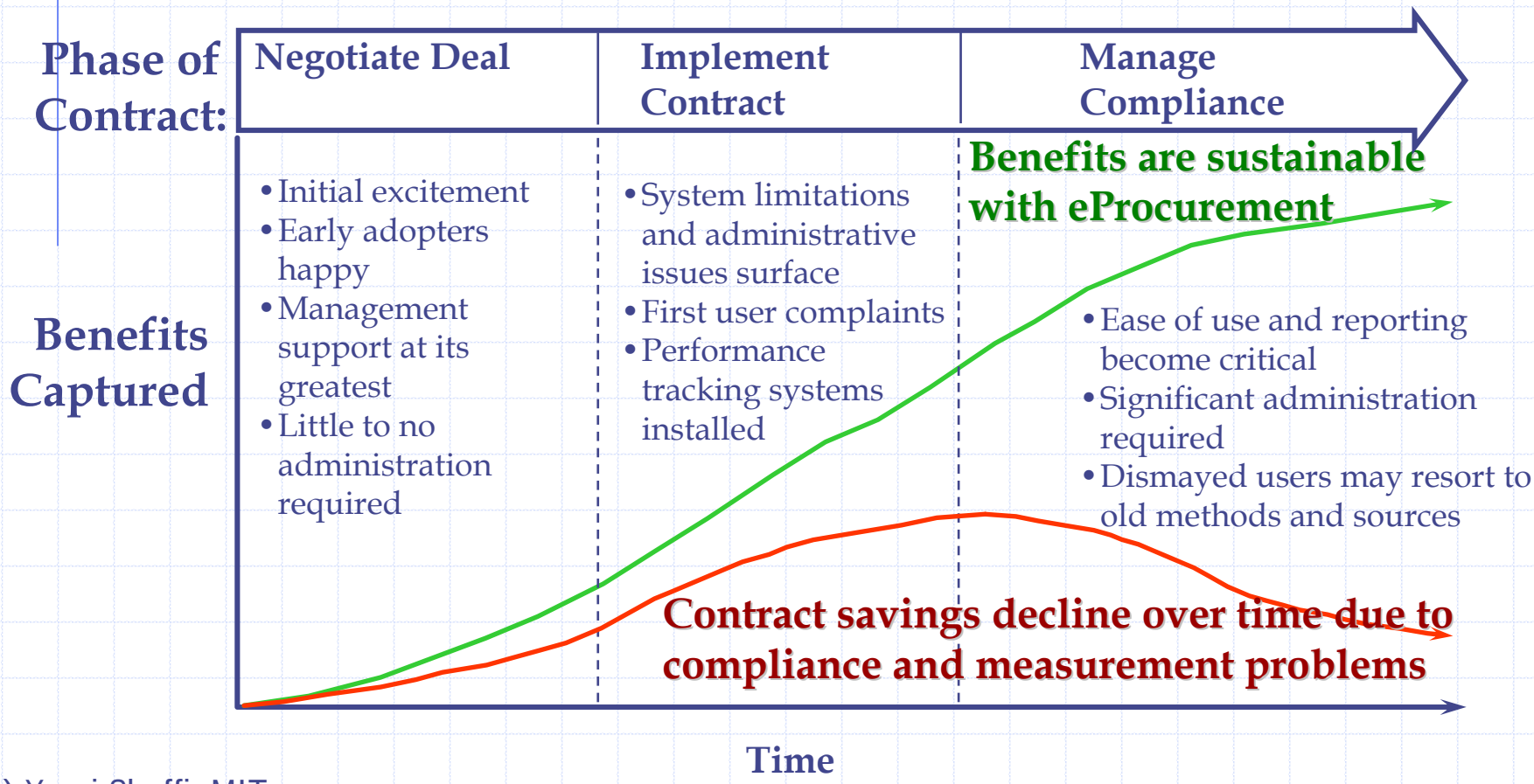


shared electronic processes

- *efficient*
- *real-time*
- *interactive*
- *improved information capture*
- *shift to higher-value activities*

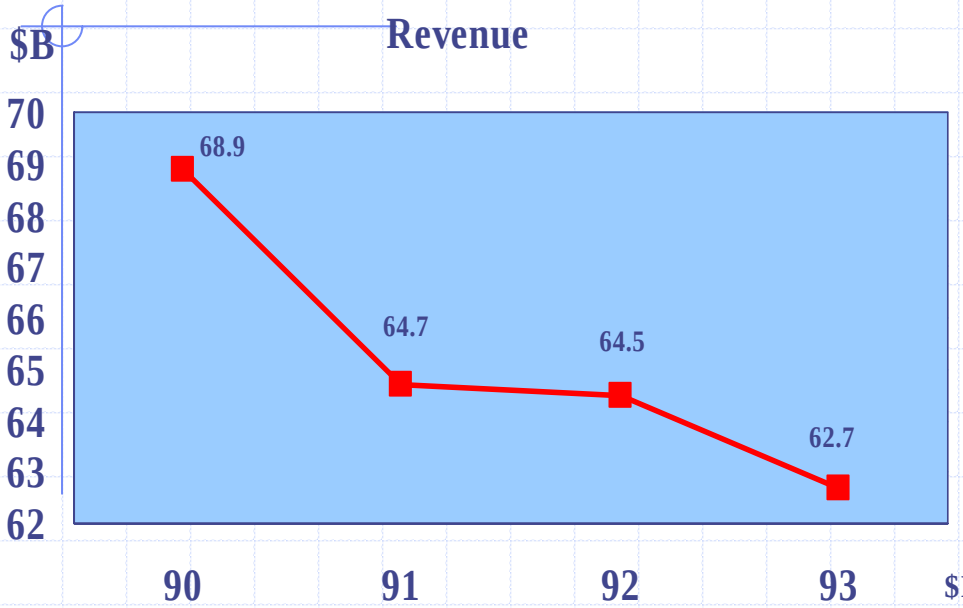
e-Procurement:

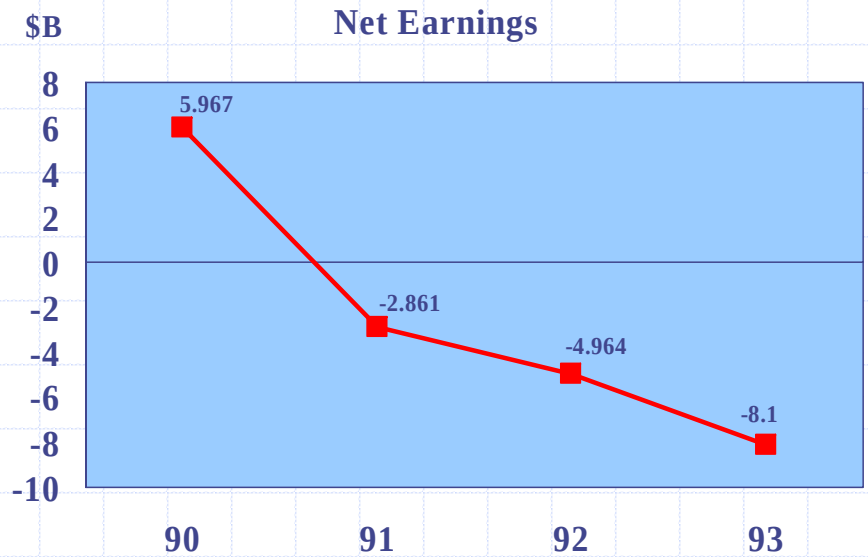
Main benefit: Improved Compliance



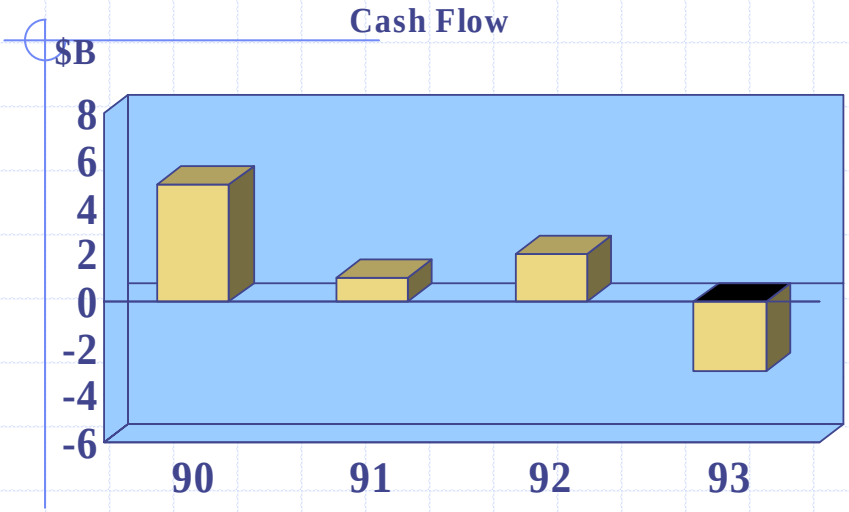
e-Procurement Applications Landscape

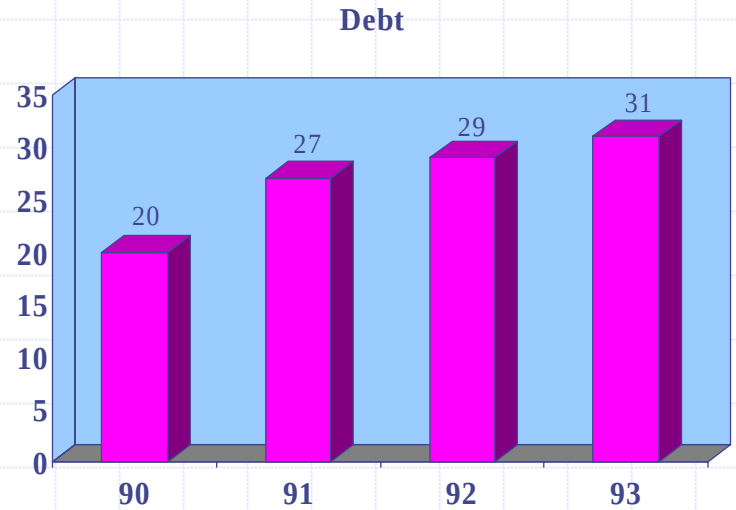
IBM Case

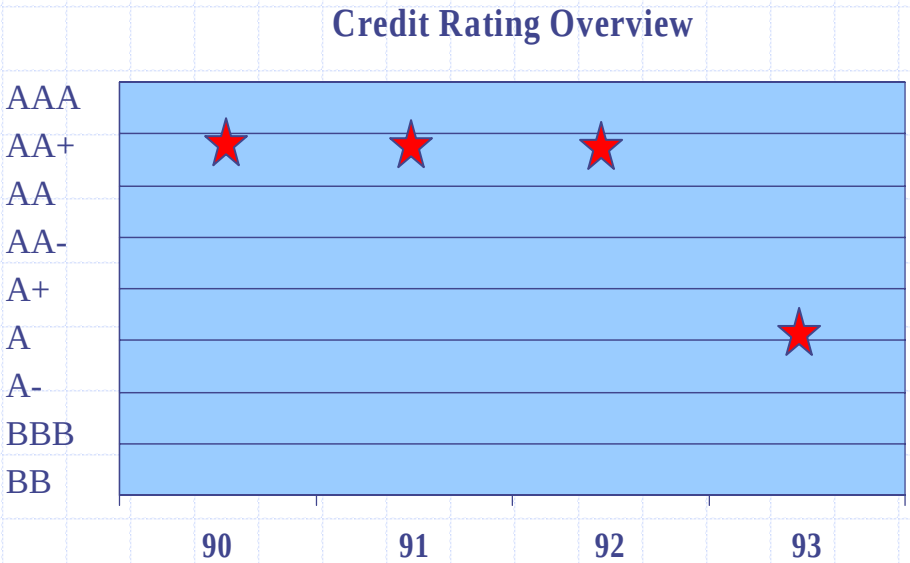

$B
Revenue
70
69
68
67
66
65
64
63
62
68.9
64.7
64.5
62.7
90
91
92
93

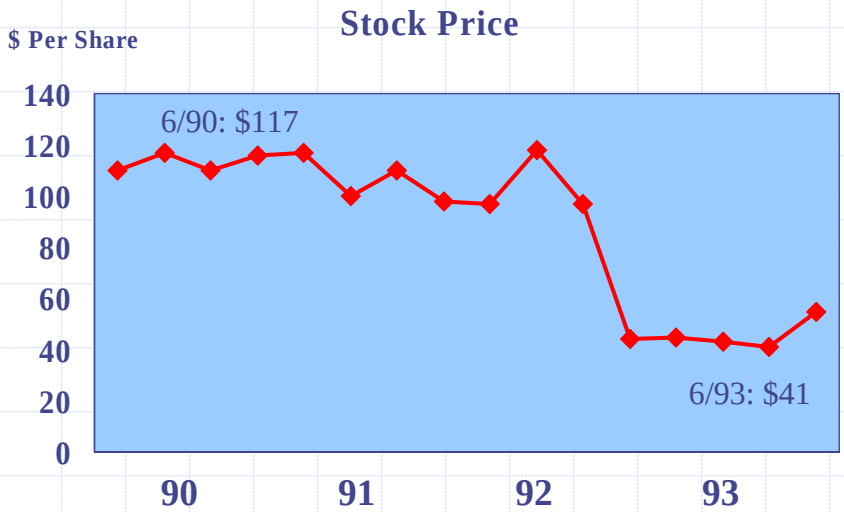

$B
Net Earnings
8
6
4
2
0
-2
-4
-6
-8
-10
5.967
-2.861
-4.964
-8.1
90
91
92
93

IBM Fortunes

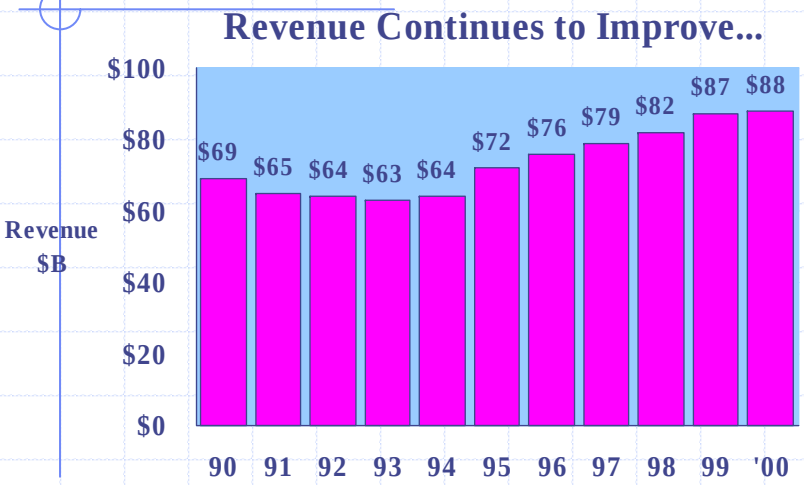


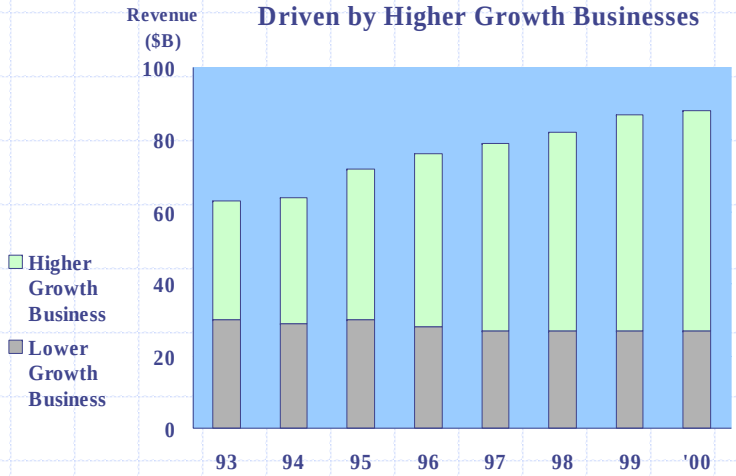


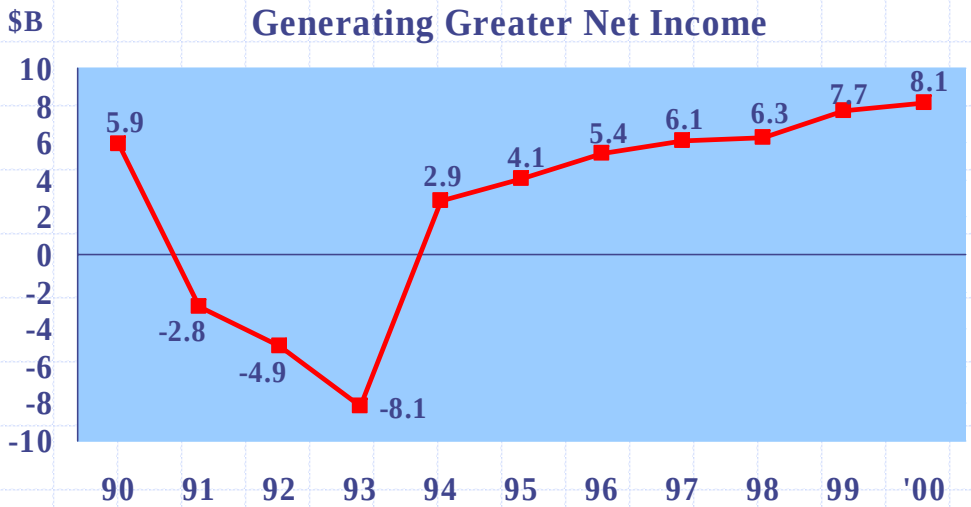


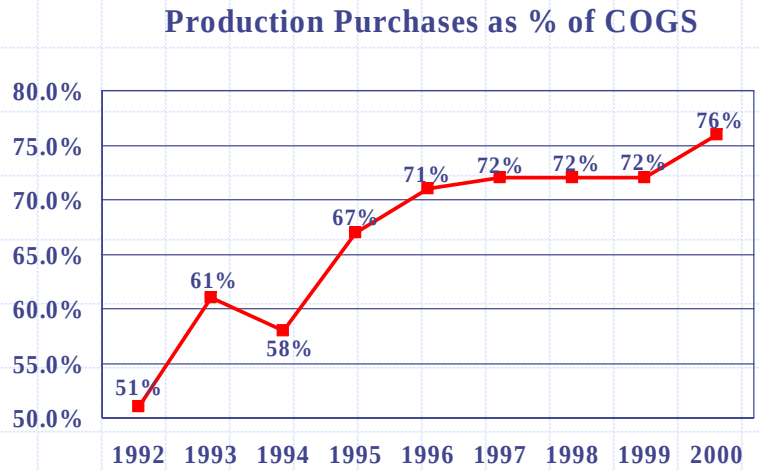


The Turnaround





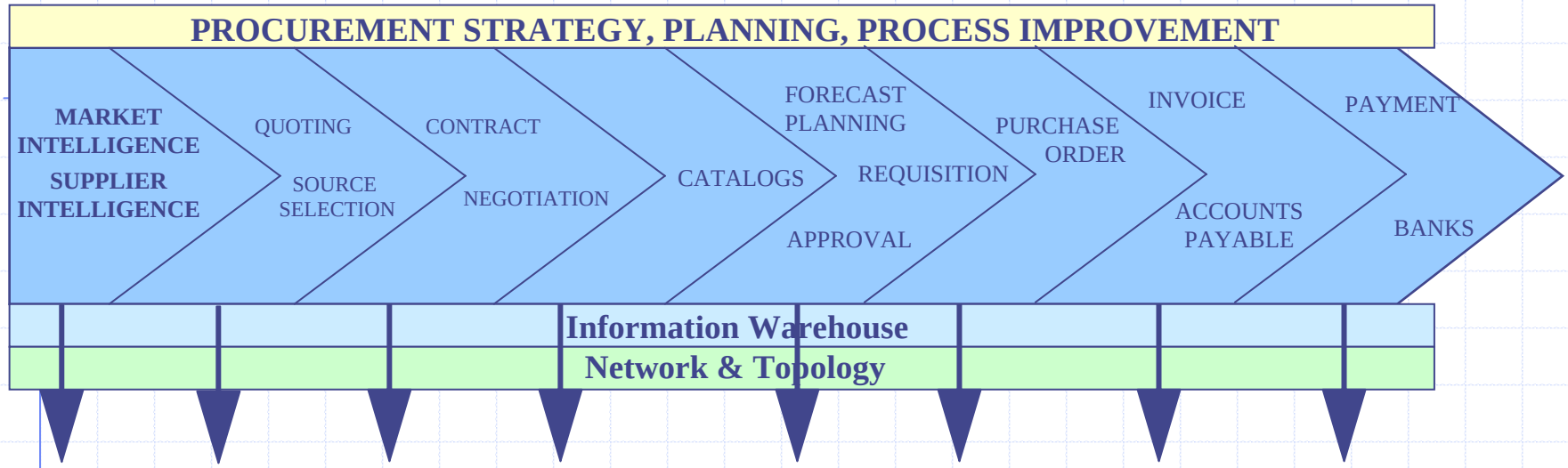




Wall Street Journal, Jan. 8, 2002

- “IBM SIGNED a $5 billion outsourcing contract and plans to sell some operations as it looks to cut costs in its personal-computer business.”

e-Procurement



–D&B Connect'ns
–Market
–Basket Analysis

–Supplier Profiles

–Industry Scoring Sys

–Internet Links

–Auto-Bid Cycles

–Internet Quoting

–Internet Quoting Integ. W/Frong End App

–Contract Lead Client

–Global Accessibility

–Contract On Line Tool

–WEB Access

–Identify Required Catalogs

–3rd Party Hosting

–Buyerless Options

–OBI/XML Capability

–Punchout

–Integrated With ERP, Trading Network

–Expanded Automation

–Buyerless

–Skills Matching

–Workflow WEB Enabled

–Electronic Approvals

–ERP Integrated Throughout Company

–EDI/XML Capability

–Workflow Enabled

–Trading Network

–Chart of Accounts Lead Client

–Electronic Invoices

–EDI/XML

–Workflow

WEB Enabled

–Positive & Negative Confirmation

–ERP, SAP, I2

–Electronic Bank Payments

–Ledger

–Taxes

–Multi-Currency

–EURO

–WEB Enabled

–ERP, SAP, I2

Exploiting the Leverage of the Web

Type of Supplier	Percent of Spend	Web Value
Core ***Trade Deep***	80%	◆Enabling greater collaboration and integration with key partners
Commodity ***Trade Broad***	15%	◆Building critical mass and extending the reach
Emerging ***Trade New***	5%	◆Extending the reach to niche suppliers ◆Leverage existing suppliers

Results

Business Metrics	Mid 1990's	2001
Maverick buying	30%	<1%
Acceptable Business Controls	40-50%	+90%
Client Satisfaction	40%	>80%
P.O. Processing Cycle Time	30 days	1 hourly
e-Transaction: Invoice Hands Free	 ?? 20%	 95% +80%
Contracts Cycle Time Length	 6-12 months 40 (+) pages	 30 days 6 pages
Ledger Miscodes	>30%	5%
Suppliers Connected via Web	0	27,000
Savings via Web	0	$330M

Combinatorial Auctions: The Transportation Example

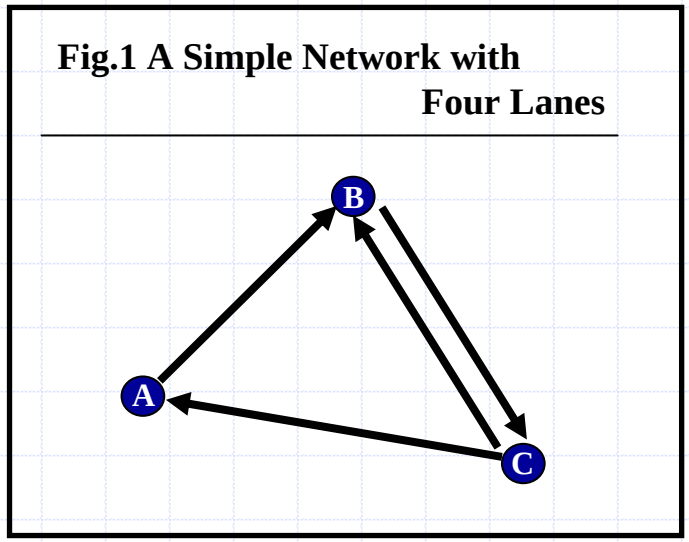
Transportation Procurement Is Different

- Controlling economics: economies of scope, not only scale
- There are many dimensions to transportation services
- Forecasting transportation is difficult
- Complex administration

Annual Procurement: What is the Issue?

Given: A distribution network

- Traffic Lanes (A→B, B→C, C→B, C→D)
- Similar Frequency & Distance
- Two Potential Carriers (I, II)



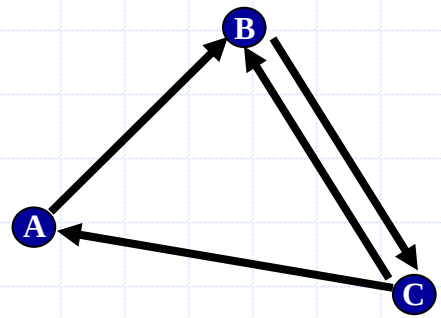
The Challenge:

Which carrier gets which lanes?

Current Practice

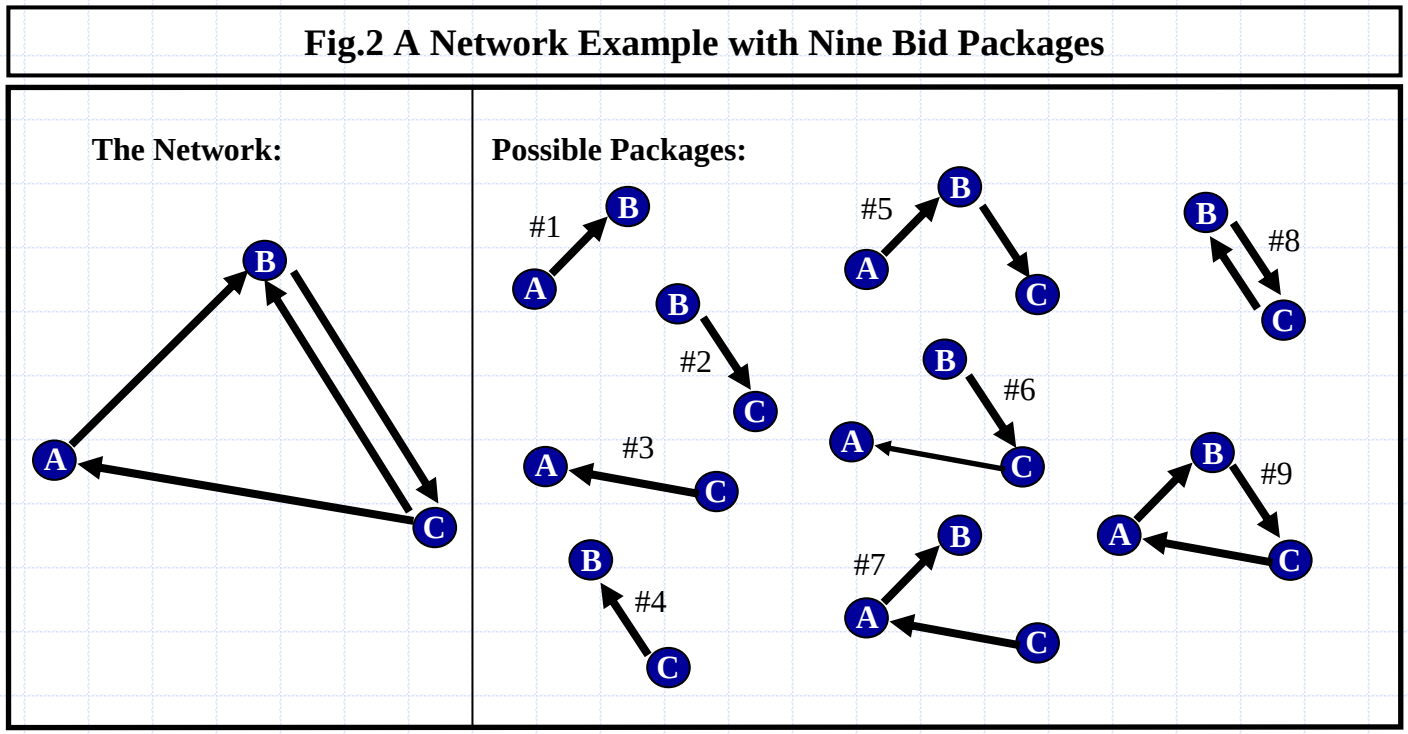
- Information exchange:
  - Shippers give aggregated volume estimates (by lane, origin, region, system), based on last year.
  - Carriers submit lane rates (per mile or per move).
- Assignment mechanism:
  - Lane-by-lane analysis.
  - Low bid wins.
  - Spreadsheet analysis.

Fig.1 A Simple Network with Four Lanes

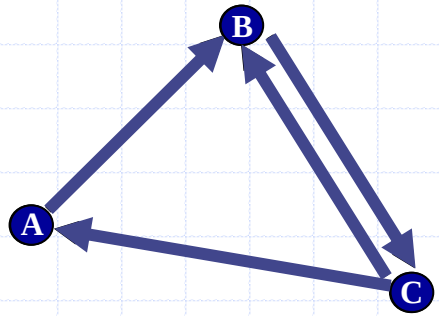


	Carriers	
Lane	**I**	**II**
A→B	$ 500	$ 525
B→C	$ 500	$ 475
C→A	$ 500	$ 525
C→B	$ 475	$ 500

Combinatorial Bidding



Packaged Bids



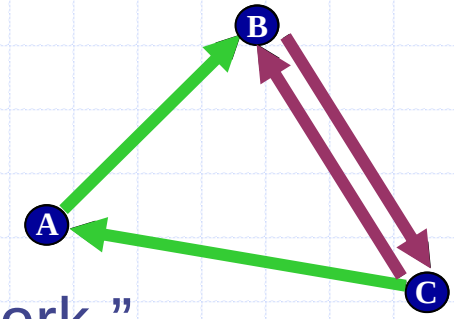
	Carrier I									Carrier II								
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#1	#2	#3	#4	#5	#6	#7	#8	#9
A→B	1				1		1		1	1				1		1		1
B→C		1			1	1		1	1		1			1	1		1	1
C→A			1			1	1		1			1			1	1		1
C→B				1				1					1				1	
Bid	500	500	500	475	975	950	975	900	1325	525	525	475	525	1000	925	925	900	1375

$1325 + $475 = $1800

Multi-attribute Procurement

- Transportation *service* involves more than price (two types of attributes):
- Lane attributes
  - Solution: use "generalized cost" with proper weights for LOS and other attributes in the optimization
- System attributes
  - Solution: introduce constraints reflecting the business rules that one wants to impose

System Constraints



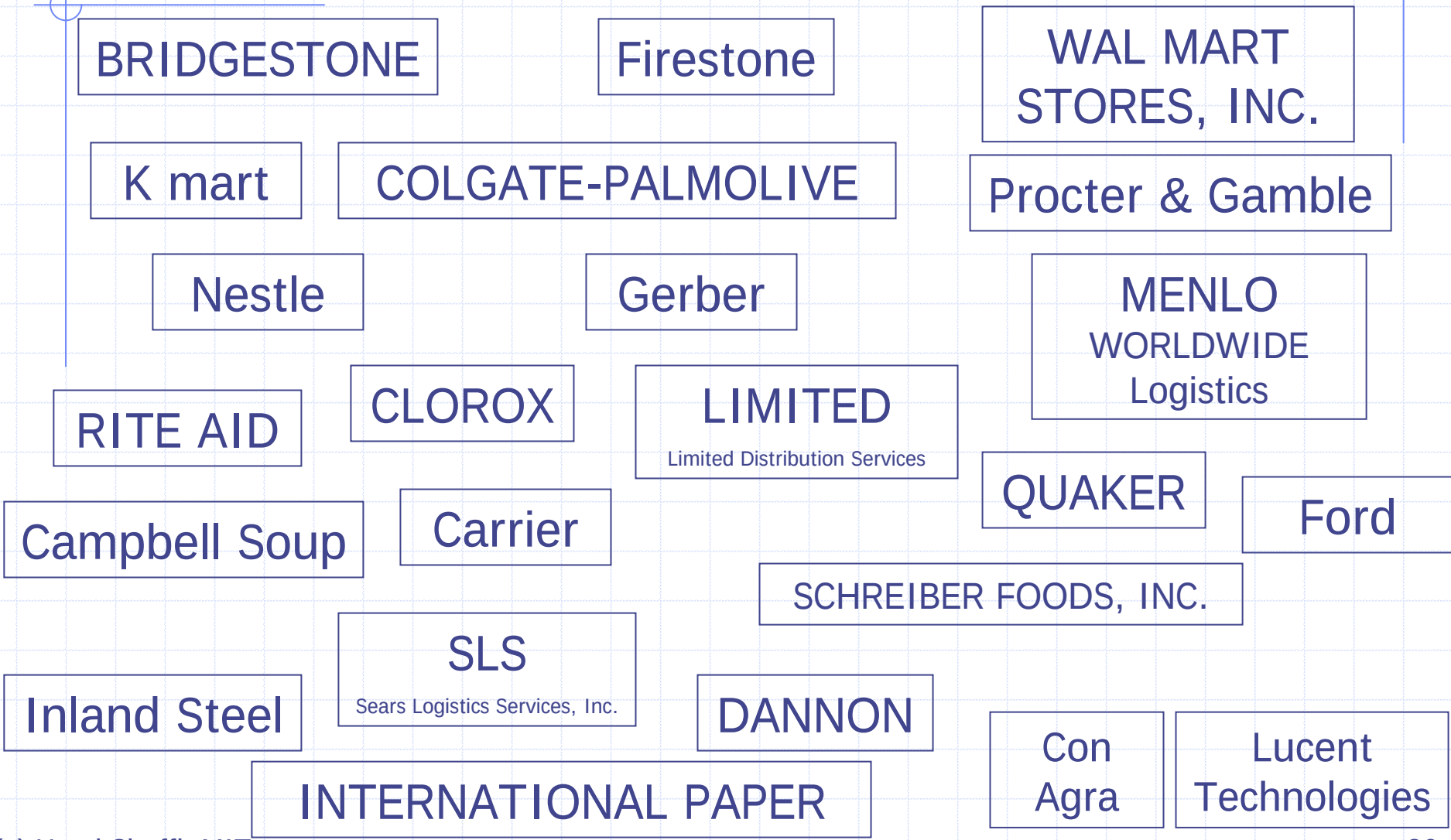
"More than one carrier serving the network."

	Carrier I									Carrier II								
	#1	#2	#3	#4	#5	#6	#7	#8	#9	#1	#2	#3	#4	#5	#6	#7	#8	#9
A→B	1				1		1		1	1				1		1		1
B→C		1			1	1		1	1		1			1	1		1	1
C→A			1			1	1		1			1			1	1		1
C→B				1				1					1				1	
Bid	500	500	500	475	975	950	975	900	1325	525	525	475	525	1000	925	925	900	1375

Re-running the optimization with additional constraints: "what if" analysis

$900 + $925 = $1825

Users of Conditional Bidding with Optimized Awards



System Requirement Example:
Core Carrier Programs

Carrier selection

How to reduce the base from 200 carriers to 10?

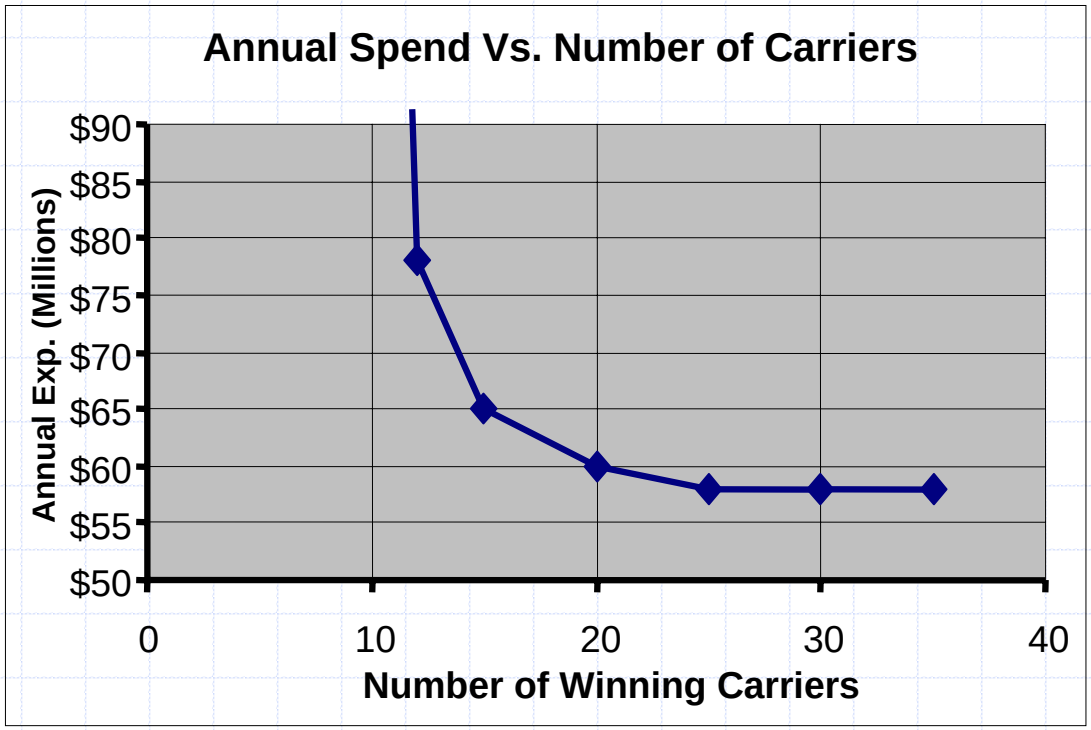
Costs and Benefits

How much does it cost to reduce the carrier base?

System Requirement Example: Core Carrier Programs

Lost Opportunity Cost

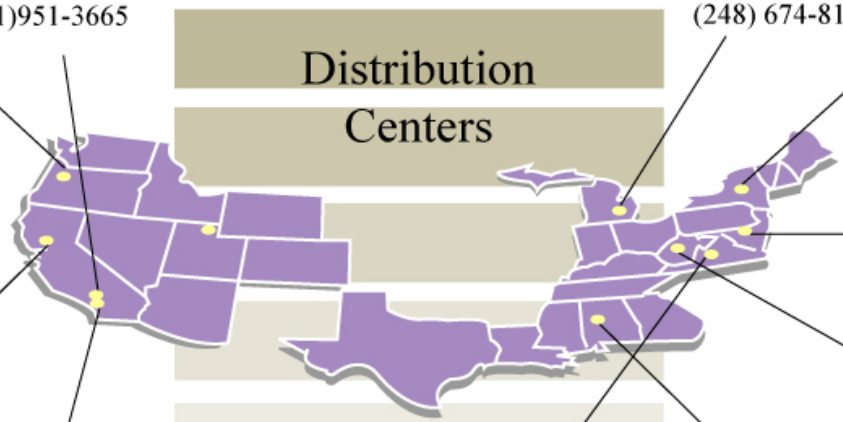
- Limiting the number of carriers constrains opportunities.
- Result: higher cost solution
- The question: is it worth it?



RITE AID

- One of the nation's leading drugstore chains
  - Modern store base
  - Strong brand
  - Modern distribution centers
  - Superior pharmacy technology
- 77,000 full and part-time associates
- 3600 stores in 30 states and DC
- $14.5B at end of FY 2001

RITE AID



WILSONVILLE (80)
29555 S.W. Boones Ferry Road
Wilsonville, OR 97070
(503) 685-6065

LANCASTER (88)
2801 W. Avenue H
Lancaster, CA 93536
(661)951-3665

PONTIAC (29)
5400 Perry Drive
Waterford, MI 48329
(248) 674-8140

ROME (60)
5865 Success Drive
West Rome Industrial Park
Rome, NY 13440
(315) 337-0125

PERRYMAN (10)
601Chelsea Road
Perryman, MD 21130
(410) 297-6000

POCA (50)
Rock Branch
Industrial Park
Putnam Country
Poca, WV 25159
(304) 755-8124

TUSCALOOSA (35)
3931 Rice Mine Rd. N.E.
Tuscaloosa, AL 35406
(205) 345-7419

WOODLAND (81)
1755 East Bearner Street
Woodland, CA 95776
(530) 661-1800

ICE CREAM
DIVISION (61)
9200 Telstar Ave.
EI Monte, CA 91731
(626) 571-0122

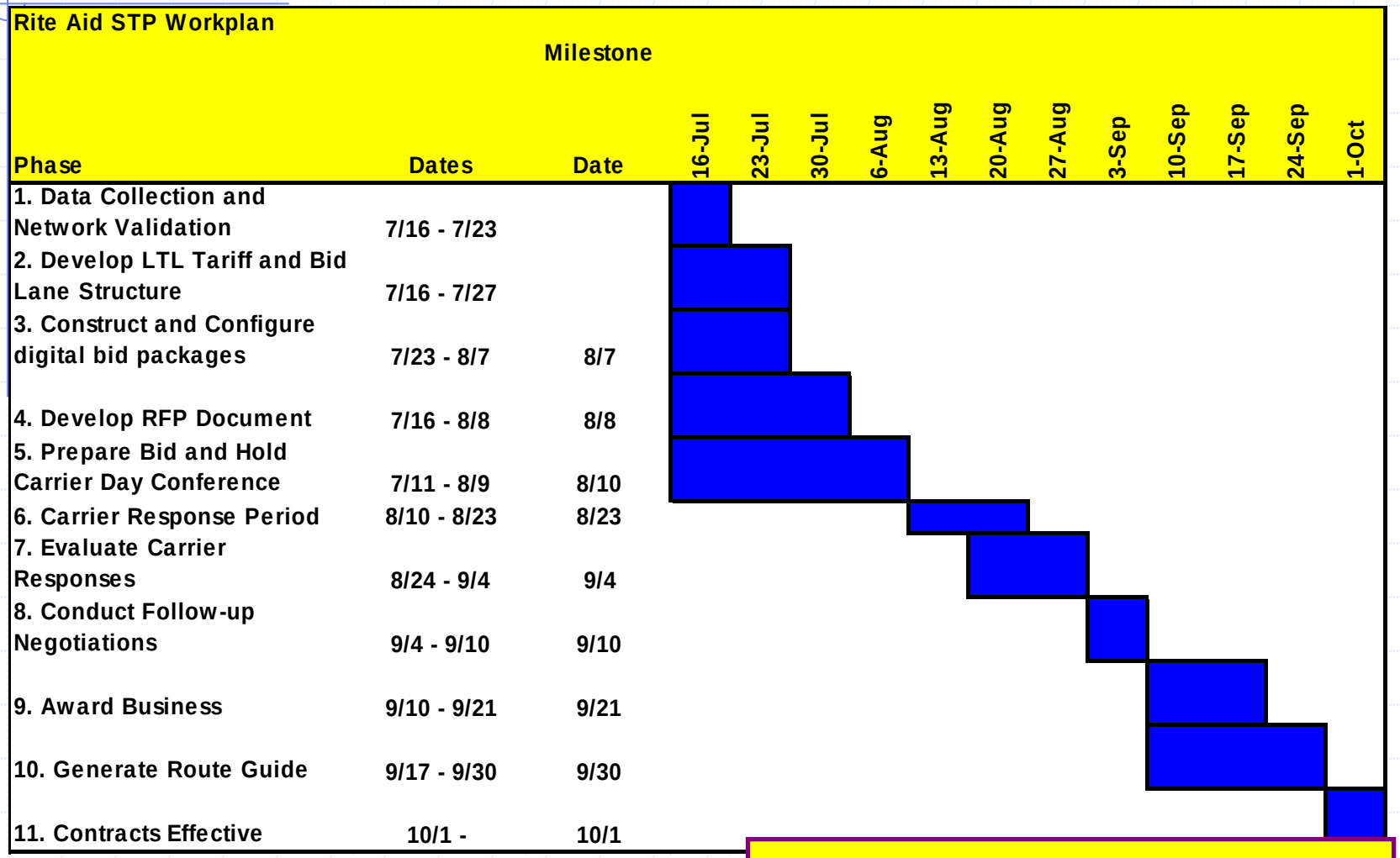
Corporate Traffic Department
30 Hunter Lane
Camp Hill, PA 17011
(717) 761-2633 (ext. 5746)
e-mail: traffic@riteaid.com

Rite Aid Carpenter Shop (32)
325 Weltown Road
Winchester, VA 22603
(540) 662-3552

The freight involved in this RFP process represented all inbound collect LTL, truckload and inter-modal freight into Rite Aid's distribution centers.

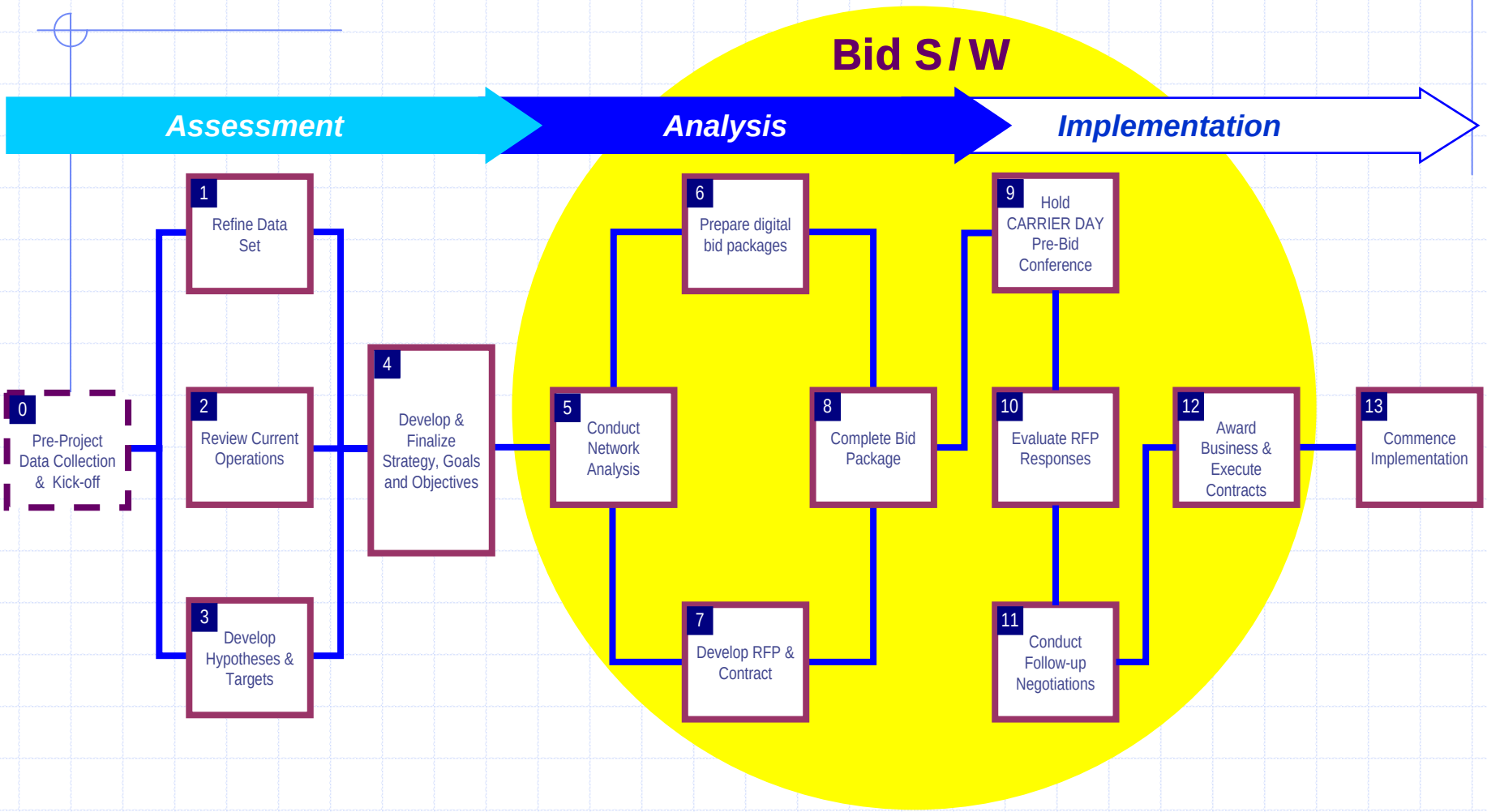
RITE AID

Project Activities & Timeline



RITE AID

The Process



The bidding software is the engine providing the analytical horsepower for optimizing pricing across complex networks.

RITE AID

Scenario Summary (Example)

Facility Code	# 422
Facility Location	Cincinnati
Number of Lanes	58
Annual Volume	2000

Scenario	Annual Spend	Savings from Baseline($)	Savings from Baseline (%)	Delta above Least Cost ($)	Delta above Least Cost (%)	Lane Coverage
Baseline	$ 1,810,208					
Least Cost Scenario	$ 1,300,132	$ 510,076	28.2%	$ -	0.0%	100%
Incumbent Carriers	$ 1,703,818	$ 106,390	5.9%	$ 403,686	31.0%	100%
Carrier "A" Sole Source	**$ 1,368,801**	**$ 441,407**	**24.4%**	**$ 68,669**	**5.3%**	**100%**
Carrier "B" Sole Source	$ 1,379,123	$ 431,085	23.8%	$ 78,991	6.1%	100%

- The **"Baseline"** is pre-defined prior to the bid process
- The **"Least Cost Scenario"** is simply the least-cost combination of rates, which is seldom implementable entirely, which leads to:
- Analysis of **"Incumbent Carriers"** and then to other pre-defined alternatives
- Other considerations include lane coverage capability, past service history, and other qualitative factors
- The final scenario is run to create a solution which is both cost effective and operationally feasible

RITE AID

Realized Benefits

- **Reduced freight costs for inbound transportation**
  - LTL savings exceeded 10%
  - TL/ Intermodal savings exceeded 7%
  - Leveraged volume from prepaid to collect conversion project
  - Holistic bid involving current and new carriers
- **Standardize and simplify administrative functions and procedures**
  - Standardized Contracts format and terms
  - Selected one standard LTL Tariff
  - Standardized tiered FAK structure
  - Standardized accessorial charges
- **Enhance service**
  - 3 of 4 LTL successful carriers were incumbent providers with a history of strong service with Rite Aid
  - Largest Incumbent Truckload and Intermodal providers with strong service records were retained
  - Benefits tracking process was developed to track project savings

Lessons

Transportation is Different

- Strong economies of scope (requires conditional bidding).
- Multi-attribute evaluation process (requires generalized “costs” and system constraints).
- A difficult forecasting problem (non-binding contracts).
- A burdensome administrative challenge (requires a single round process).

Optimization-based Conditional Bidding

- Allows carriers to achieve better economics.
- LOS can be handled rigorously.
- External conditions can be incorporated.
- Allows for special forecasting methods.
- Allows one-round process - preferred to multiple rounds (but requires optimization).
- Automated administrative process.

Lessons

- Need for a contract-augmenting procedure
- Need for tender-rejection management
  - Replace “dialing for diesels”
- Need for TMS that can execute sophisticated bid results (e.g., Surge pricing)
- Some conditional bid results are surprising
- Problems with Carrier participation:
  - Complicated
  - Actual awards
  - Timing

Any Questions?

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