A Bit of History: 1930-1950

Willie Sutton

- Bank Robber “Slick Willie” Sutton
- When asked why he robbed banks, Sutton simply replied
- "Because that's where the money is."

Where the Money Is

- Supply-chain generally accounts for between 60% and 90% of all company costs1
- A 2% improvement in process efficiency for supply-chain processes has 3000% - 5000% the impact of a 2% improvement in efficiency for… IT, HR, Finance[1]… Sales…
- Any surprise most Process Methodologies or techniques had their origin primarily in Supply-Chain Management?
  - Six-Sigma Lean BPR ERP ISO MRP-II TQM…

Fortune-10 Company Supply-Chain Cost % Total Costs[2]									
GM	Ford	Conoco	Wal-Mart	Chevron	IBM	Exxon	GE	Citi[1]	AIG[1]
94%	93%	90%	90%	88%	77%	75%	63%	0%	0%

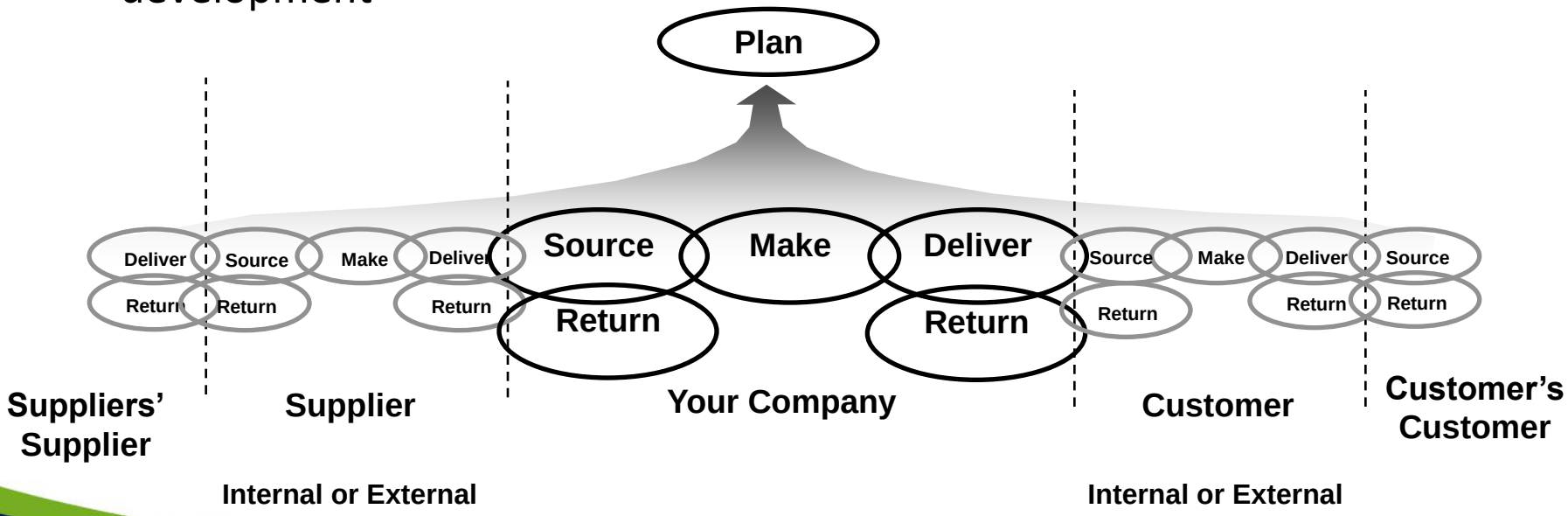
1 Exclusive of Financial Services companies
2 Source: Hoovers 2006 Financial Data, Supply-Chain Council 2006 SCM Benchmark data on SCM cost for discrete & process industries

SCC: An independent, non-profit global association

- Formed in 1996 to **create and evolve a standard industry process reference model** of the supply chain for the benefit of helping companies rapidly and dramatically improve supply chain operations
- SCC has established the supply chain world's most widely accepted framework – the SCOR® process reference model – for **evaluating and comparing supply chain activities and their performance**
  - It can be used to describe supply chains that are very simple or very complex using a common set of definitions and enabling a common understanding
  - It lets companies quickly determine and compare the performance of supply chain and related operations within their company or against other companies
- SCC **continually advances its tools and educates members** about how companies are capitalizing on those tools
  - With membership open to all interested organizations

The SCOR® model – an industry open standard

- SCOR is a supply chain process reference model containing over 200 process elements, 550 metrics, and 500 best practices including risk and environmental management
- Organized around the five primary management processes of Plan, Source, Make, Deliver and Return
- Any interested organization can participate in its continual development



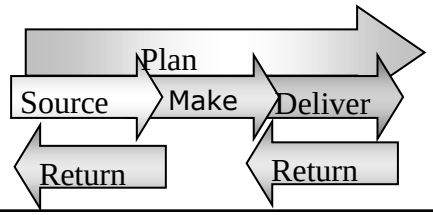
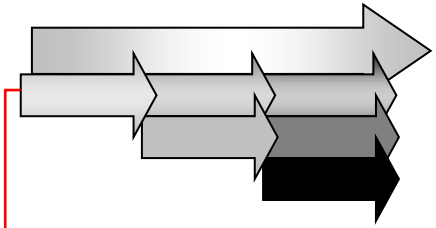
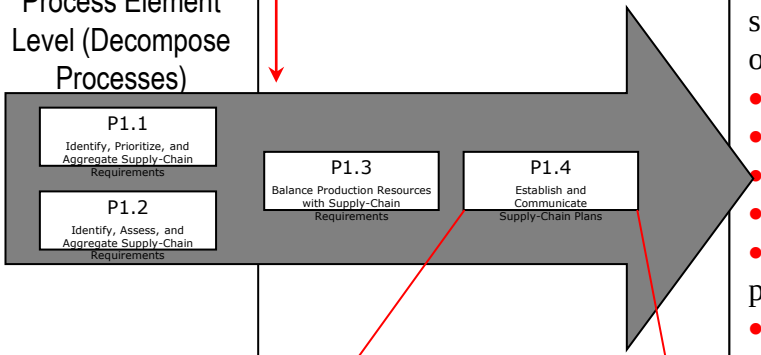
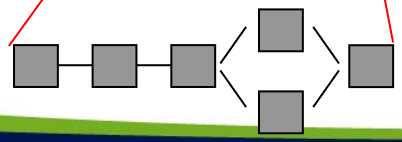
Scopes of Basic Management Processes

- *Plan* (Processes that balance aggregate demand and supply to develop a course of action which best meets sourcing, production and delivery requirements)
  - Balance resources with requirements
  - Establish/communicate plans for the whole supply chain
- *Source* (Processes that procure goods and services to meet planned or actual demand)
  - Schedule deliveries (receive, verify, transfer)
- *Make* (Processes that transform product to a finished state to meet planned or actual demand)
  - Schedule production
- *Deliver* (Processes that provide finished goods and services to meet planned or actual demand, typically including order management, transportation management, and distribution management)
  - Warehouse management from receiving and picking product to load and ship product.
- *Return* (Processes associated with returning or receiving returned products)
  - Manage Return business rules

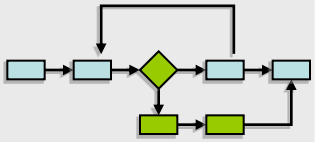
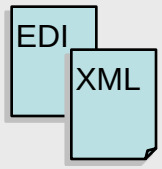
Levels of Process Detail

Supply Chain Operations Reference Model

Not in Scope

Level #	Description	Schematic	Comments
1	Top Level (Process Types)		Level 1 defines the scope and content for the Supply chain Operations Reference-model. Here basis of competition performance targets are set.
2	Configuration Level (Process Categories)		A company's supply chain can be "configured-to-order" at Level 2 from the core "process categories." Companies implement their operations strategy through the configuration they choose for their supply chain.
3	Process Element Level (Decompose Processes)		Level 3 defines a company's ability to compete successfully in its chosen markets, and consists of: •Process element definitions •Process element information inputs, and outputs •Process performance metrics •Best practices, where applicable •System capabilities required to support best practices •Systems/tools
4	Implementation Level (Decompose Process Elements)		Companies implement specific supply-chain management practices at this level. Level 4 defines practices to achieve competitive advantage and to adapt to changing business conditions.

SCOR Processes

Level 1	Level 2	Level 3	Level 4	Level 5
Scope	Configuration	Activity	Workflow	Transactions
Supply-Chain Source	S1 Source Stocked Product	S1.2 Receive Product		
Differentiates Business	Differentiates Complexity	Names Tasks	Sequences Steps	Links Transactions
Defines Scope	Differentiates Capabilities	Links, Metrics, Tasks and Practices	Job Details	Details of Automation
Framework Language	Framework Language	Framework Language	Industry or Company Specific Language	Technology Specific Language

Standard SCOR definitions

Company/Industry definitions

Performance Metrics

- SCOR metrics: Standard Strategic (Level 1) Metrics

	Attribute	Metric (Strategic)
Customer	Reliability	Perfect Order Fulfillment
	Responsiveness	Order Fulfillment Cycle Time
	Agility	Supply Chain Flexibility
		Supply Chain Adaptability†
Internal	Cost	Supply Chain Management Cost
		Cost of Goods Sold
	Assets	Cash-to-Cash Cycle Time
		Return on Supply Chain Fixed Assets
		Return on Working Capital

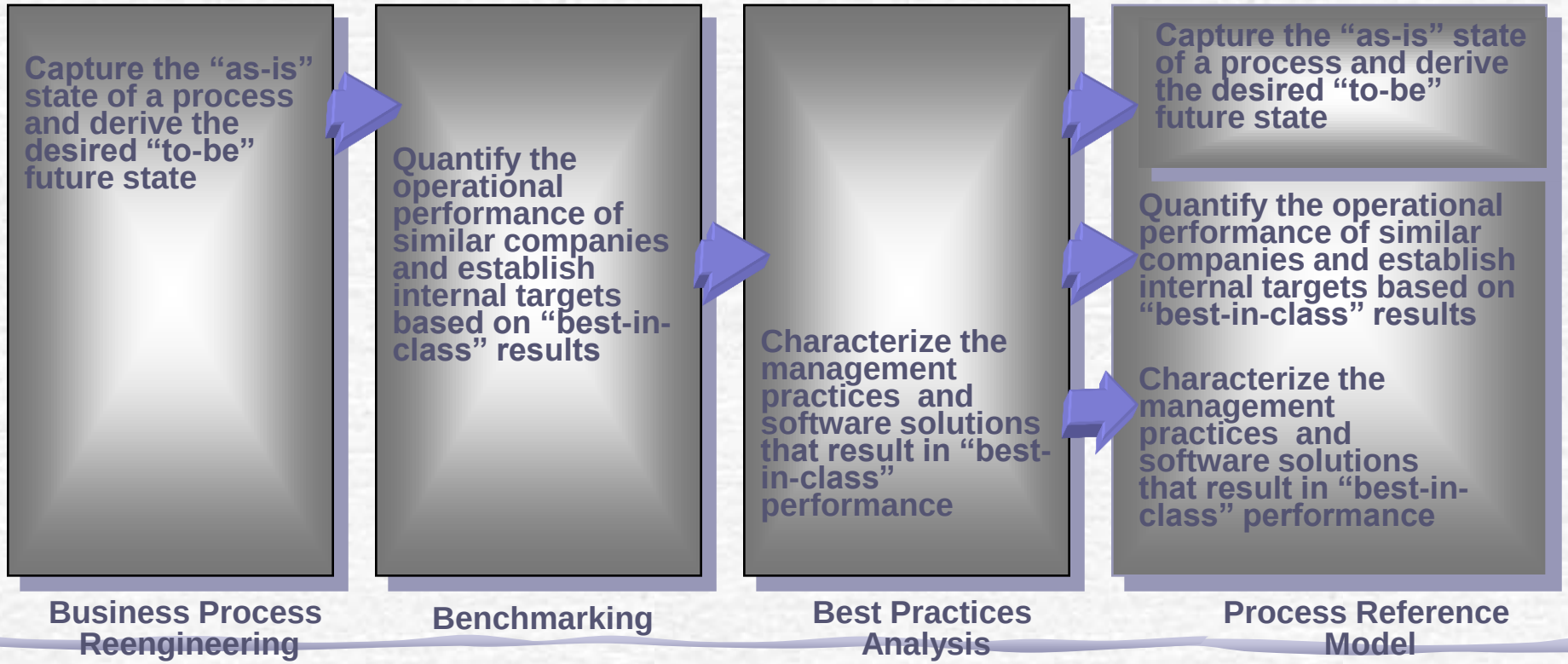
† upside and downside adaptability metrics

7 Steps of a Benchmarking Program

- Supply Chain Definition
- Supply Chain Prioritization
- Supply Chain Strategy
- Selecting Metrics
- Sourcing Data
- Creating a Balanced SCORcard™
- Performing Benchmark

Supply Chain Operations Reference Model (SCOR)

- SCOR:
  - Integrates Business Process Reengineering, Benchmarking, and Process Measurement into a cross-functional framework.



Supply Chain Prioritization

- We use a tool called the **Supply Chain Prioritization Matrix** to order the supply-chains according to relevance
- Each supply chain can be ranked by a number of features
- We suggest:
  - size (revenue, volume, and margin),
  - complexity (# SKUs)
  - strategic importance
- You can also look at them by
  - Cash Consumption
  - Risk
  - Volume variability
  - Etc.

Supply Chain Strategy

- We use a tool called the Supply Chain Strategy Matrix to Identify priority strategic features or attributes of supply-chains.
- Each supply chain strategy is indicated by a collection of ranked features:

Reliability	On time? Complete? Undamaged?
Responsiveness	From Customer Request to final acceptance
Flexibility	How long to scale up? How expensive to scale down?
Cost	Cost of Processes? Cost of Goods Sold?
Assets	Working Capital? Return on Investments?

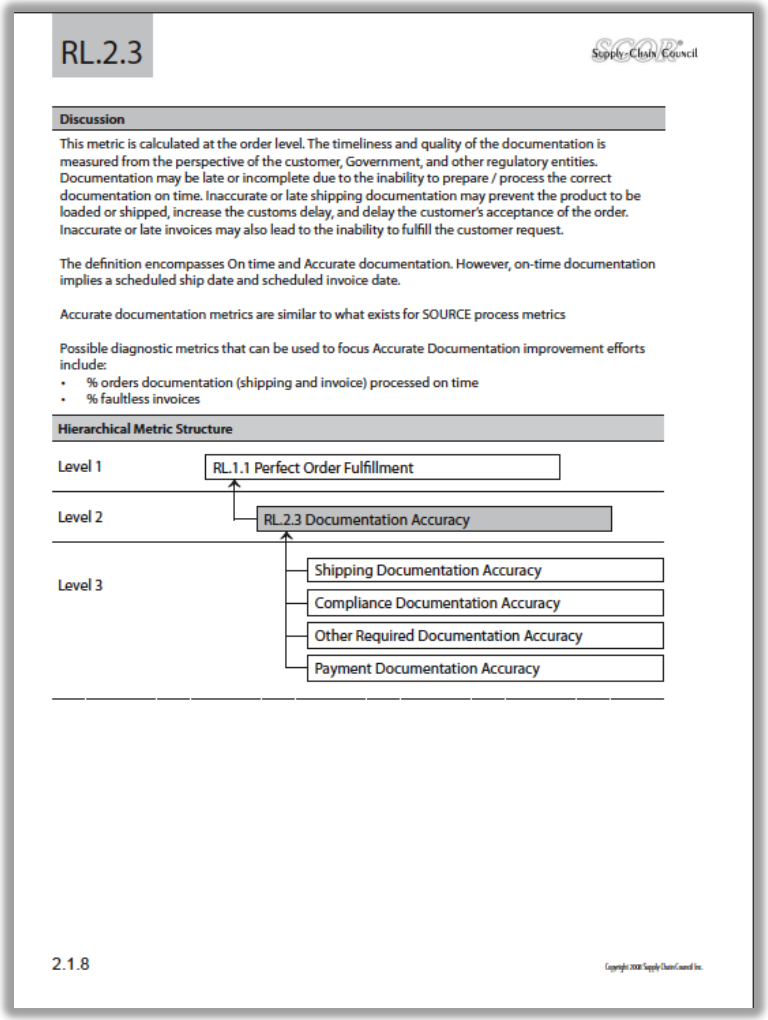
Comparative Ranking

- We advocate using a simple ranking system for industry comparison
- Each rank corresponds to a specific percentile in industry performance
- We do not use averages or other statistical tests
- Our key ranks:

Performance	Percentile	Choices	Interpretation
Superior	90th	1	"Top 10" performer
Advantage	70th	2	"Top Half" performer
Parity	50th	2	"Half better/Half worse"

The SCORcard

- We use a tool called the Supply Chain SCORcard™ to Identify performance characteristics of supply-chains.
- Each SCORcard™ is built from a subset of hundreds of SCOR metrics.
- For supply-chain benchmarking we generally use only Level 1, 2 and 3 metrics
- The SCOR Manual provides all necessary definitions



RL.2.3

Supply-Chain Council

Discussion

This metric is calculated at the order level. The timeliness and quality of the documentation is measured from the perspective of the customer, Government, and other regulatory entities. Documentation may be late or incomplete due to the inability to prepare / process the correct documentation on time. Inaccurate or late shipping documentation may prevent the product to be loaded or shipped, increase the customs delay, and delay the customer's acceptance of the order. Inaccurate or late invoices may also lead to the inability to fulfill the customer request.

The definition encompasses On time and Accurate documentation. However, on-time documentation implies a scheduled ship date and scheduled invoice date.

Accurate documentation metrics are similar to what exists for SOURCE process metrics

Possible diagnostic metrics that can be used to focus Accurate Documentation improvement efforts include:

- % orders documentation (shipping and invoice) processed on time
- % faultless invoices

Hierarchical Metric Structure

Level 1: RL.1.1 Perfect Order Fulfillment

Level 2: RL.2.3 Documentation Accuracy

Level 3:
- Shipping Documentation Accuracy
- Compliance Documentation Accuracy
- Other Required Documentation Accuracy
- Payment Documentation Accuracy

2.1.8

Performance Metrics

- SCOR metrics: Standard Strategic (Level 1) Metrics

	Attribute	Metric (Strategic)
Customer	Reliability	Perfect Order Fulfillment
	Responsiveness	Order Fulfillment Cycle Time
	Agility	Supply Chain Flexibility
		Supply Chain Adaptability†
Internal	Cost	Supply Chain Management Cost
		Cost of Goods Sold
	Assets	Cash-to-Cash Cycle Time
		Return on Supply Chain Fixed Assets
		Return on Working Capital

† upside and downside adaptability metrics

SCORcards in 5 Minutes

Philosophy

- You need to have the most data where performance is most critical
- You need to have least data where performance is least critical

For Every	Superior	Advantage	Parity
Select	Level 1 Metric	Level 1 Metric	Level 1 Metric
and	Level 2 Metric	Level 2 Metric	
and	Level 3 Metric		

Metrics Selection

Supply-Chain SCORcard		S/A/P	Level-1 Metric	Level-2 Metric	Level-3 Metric	Summary
External	Responsiveness	A	Order Fulfilment Cycle Time			Order Fulfillment Cycle Time
	Responsiveness			Source Cycle Time		Source Cycle Time
	Responsiveness			Make Cycle Time		Make Cycle Time
	Responsiveness			Deliver Cycle Time		Deliver Cycle Time
	Flexibility	P	Upside Supply-Chain Flexibility			Upside Supplly-Chain Flexibility
Internal	Cost	P	Total Supply Chain Management Cost			Total Supply Chain Management Cost
	Assets	A	Cash to Cash Cycle Time			Cash to Cash Cycle Time
	Assets			Days Sales Outstanding		Days Sales Outstanding
	Assets			Days Payables Outstanding		Days Payables Outstanding
	Assets			Inventory Days of Supply		Inventory Days of Supply

Planning Data Gathering: Sources of Data

- Financial Data
  - 10-K data, Company Annual Reports, Cost Center Reports
  - Must be Verified by Financial Team (Controller)
- Non-Financial Data
  - Customers
    - Delivery Performance
    - Total Cycle-Time Performance
  - IT Systems
    - Process-to-Process Transactions
    - Planning System Parameters (Lead Times)
  - Suppliers
  - 3PL Providers

Data Gathering Plan

- Look at who owns the data
- Consider where the transactions may be
- Organize to alert data owners to gather data
- Collect and assess Data Quality
- Use SCOR Metrics Definition as a guide

Metric	Process	Owner	Due Date	Status
On-Time Delivery	D1.16	Logistics	2/2/2008	Complete
Undamaged	D1.17	3PL Provider	2/15/2008	50% Collected
Order Fulfillment Cycle Time	D1.1 – D1.17	Deliver Team	2/22/2008	Not started
Etc…				

The Create the SCORcard

- Based on average data averaged over many samples
- Comes from root transactions, not aggregates
- Six-Sigma team support a big help

Attribute	SAP	Metric (level 1)	You	Parity	Adv	Superior	Gap
Reliability	S	Perfect Order Fulfillment	97%				
Response	A	Order Fulfillment Cycle Time	14 days				
Flexibility	P	Ups. Supply Chain Flexibility	62 days				
Cost	P	Supply Chain Mgmt Cost	12.2%				
Assets	A	Cash-to-Cash Cycle Time	35 days				

SCORmark™

- Once the SCORcard is defined, and data for most metrics are gathered
- Data are submitted electronically to the SCORmark™ system
- With days or weeks, an electronic report is returned with the results of comparison against selected demographic groups
- The principal function of the Benchmark is to determine the gap between actual performance and performance corresponding to desired strategic positioning.
- The Benchmark is a component of Phase I and II of the SCOR Implementation Roadmap

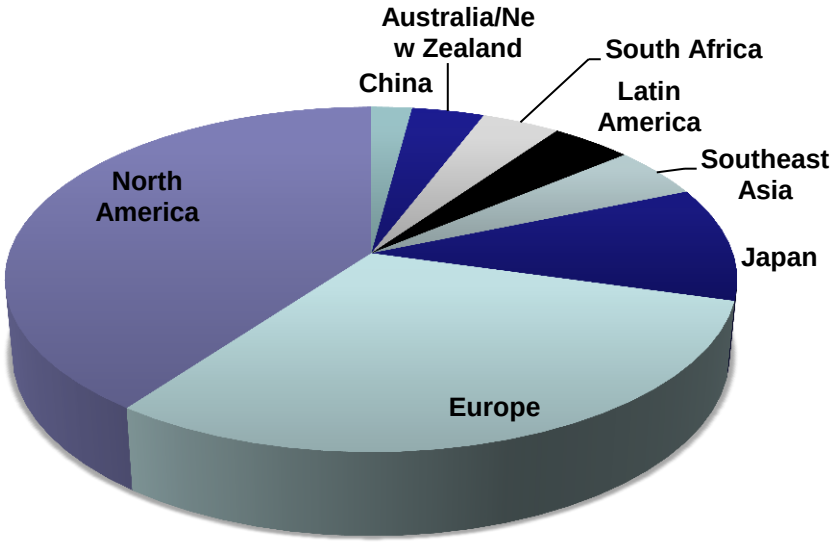
Interpreting the Data

- Used for choosing target performance
- Critical to understand Performance in a particular Demographic
- Can be “internal” (competing against other supply chains in same company)
- Aligns Strategy, Performance, and Performance Goals

Attribute	SAP	Metric (level 1)	You	Parity	Adv	Superior	Gap
Reliability	S	Perfect Order Fulfillment	97%	92%	95%	98%	1%
Response	A	Order Fulfillment Cycle Time	14 days	8 days	6 days	4 days	8 Days
Flexibility	P	Ups. Supply Chain Flexibility	62 days	80 days	60 days	40 days	0
Cost	P	Supply Chain Mgmt Cost	12.2%	10.8%	10.4%	10.2%	1.4%
Assets	A	Cash-to-Cash Cycle Time	35 days	45 days	33 days	20 days	2 Days

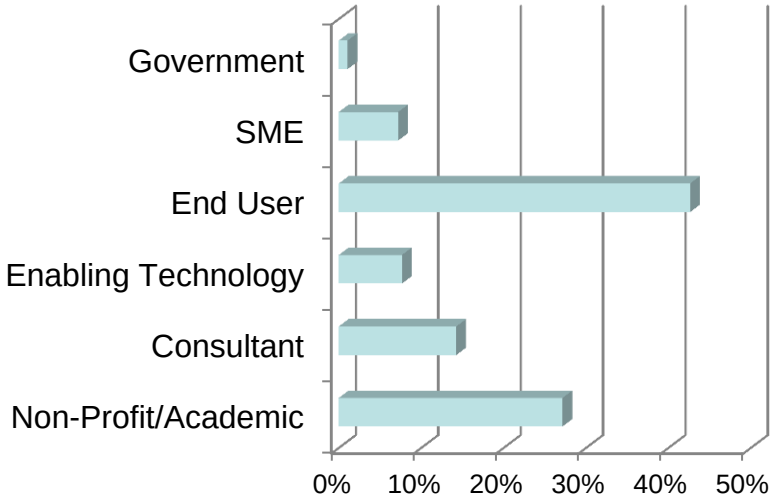
Global Operations Supporting Over 800 Member Organizations

Member Location



Also developing chapters in India and the Middle East

Member Affiliation



SCOR has proven to improve operating results many ways

- Improvement of operating results of an average of 3% in the initial SCOR implementation phase by means of cost reduction and improvement in customer service[1]
- Increase in profitability (between 2x and 6x) with regard to project investment costs within first 12 months of implementation[1]
- Reduction in IT costs through minimizing system customization and making better use of standard functionality[1]
- Continuous actualization of process change portfolio by continuous conversion of supply chain improvements with the objective of increasing annual profits by 1% to 3%[1]

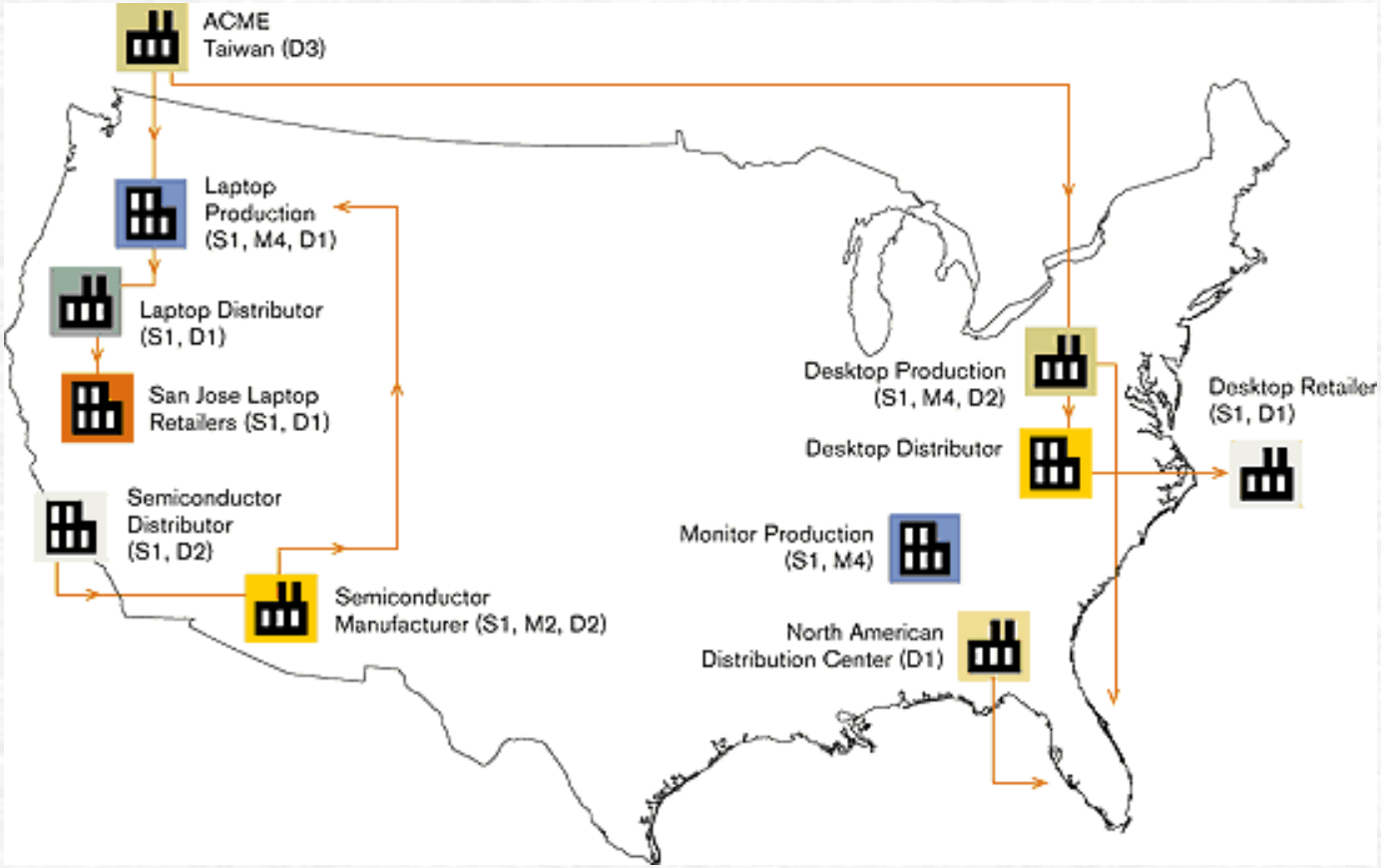
[1]Poluha (2007) *Application of the SCOR Model in Supply Chain Management, New York, USA*

Benefits of SCOR

- Improvement in stock market value
- Increase of profits and margins
- Increase of available financial means through improved investment selection (portfolio management of initiatives)
- Reduction of overall costs
- Optimization of Enterprise Resource Planning

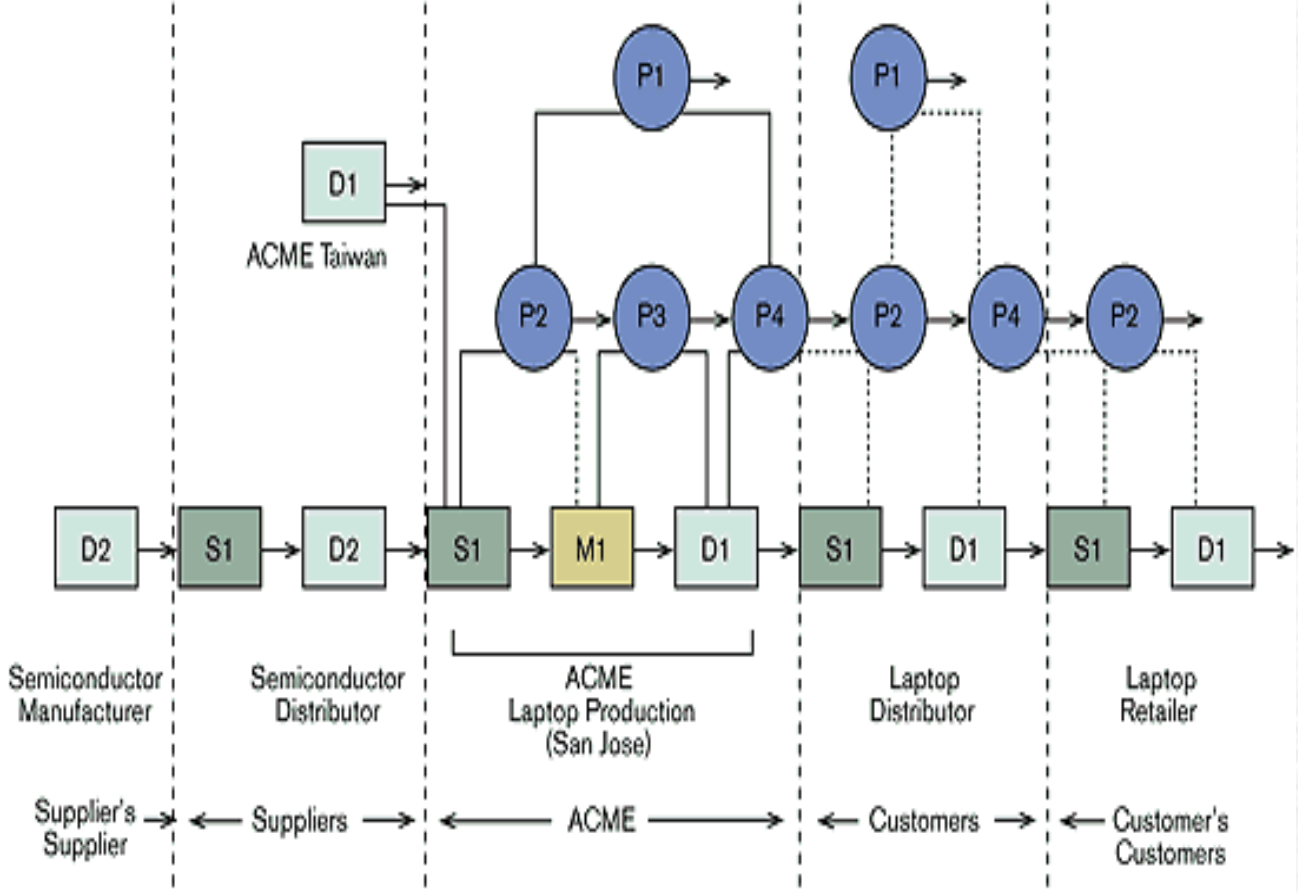
Some Graphical Tools:

1st Step in configuring a SC: Illustrate physical layout, material flow and place Level 2 execution process categories to describe activities at each location.



SCOR Process Maps

2nd Step: Create the SCOR Process Maps: Place planning process categories, using dashed lines to show links with execution processes



Software Package for Modeling SCOR: ARIS EasySCOR

- The ARIS Toolset and ARIS Easy Design are process modeling tools. The ARIS Toolset is a BPR tool, Easy Design is used for process capture.
- The EasySCOR Modeler is a software package that includes the ARIS Easy Design modeling kit and the SCOR model in ARIS format.
- ARIS EasySCOR consists of process models that describe the SCOR levels 1 to 3. Implementation level, level 4 is not included.

Process Map Example created in ARIS EasySCOR