Supply Chain Operations (SCOR) Reference Model and the Integrated Business Reference Framework

Scott Stephens
President
Business Forerunners, Inc.

Chief Technology Officer
Supply Chain Council
www.supply-chain.org

Introduction

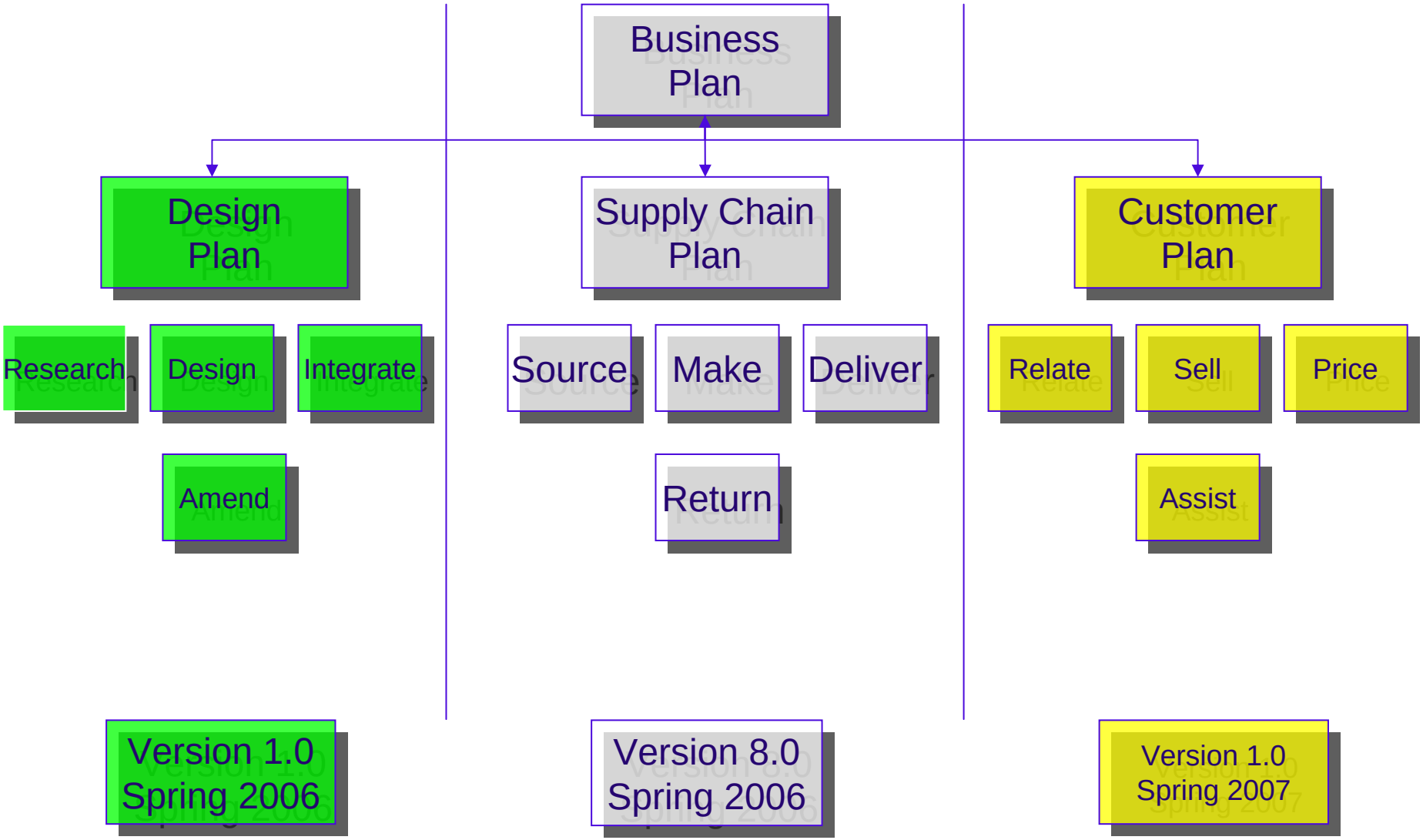
- This presentation describes preliminary concepts in managing the advancement of the state of the art of business operations by the Supply Chain Council
  - While SCOR development activities are relatively mature, the Council is working to develop a consensus philosophy in the management of an integrated business reference framework
  - This presentation should be considered a “working” paper

- The Integrated Business Framework (DCOR – SCOR – CCOR)
- Common Process Structure
- Common Metrics
- Common Implementation Methodology
- Component Model Linkage
- Design Advantages
- Common Tools

SCOR and Business Competitiveness

- Practitioners (business leaders) created the SCOR Model and the Supply Chain Council to improve competitiveness and cooperation between trading partners
- Competitiveness improved in three ways:
  - Reducing costs
  - Increasing revenue
  - Improving the efficiency of asset management
- Partner cooperation improved by establishing a cross-enterprise / cross-industry common language, set of common measurements, and a set of best practices

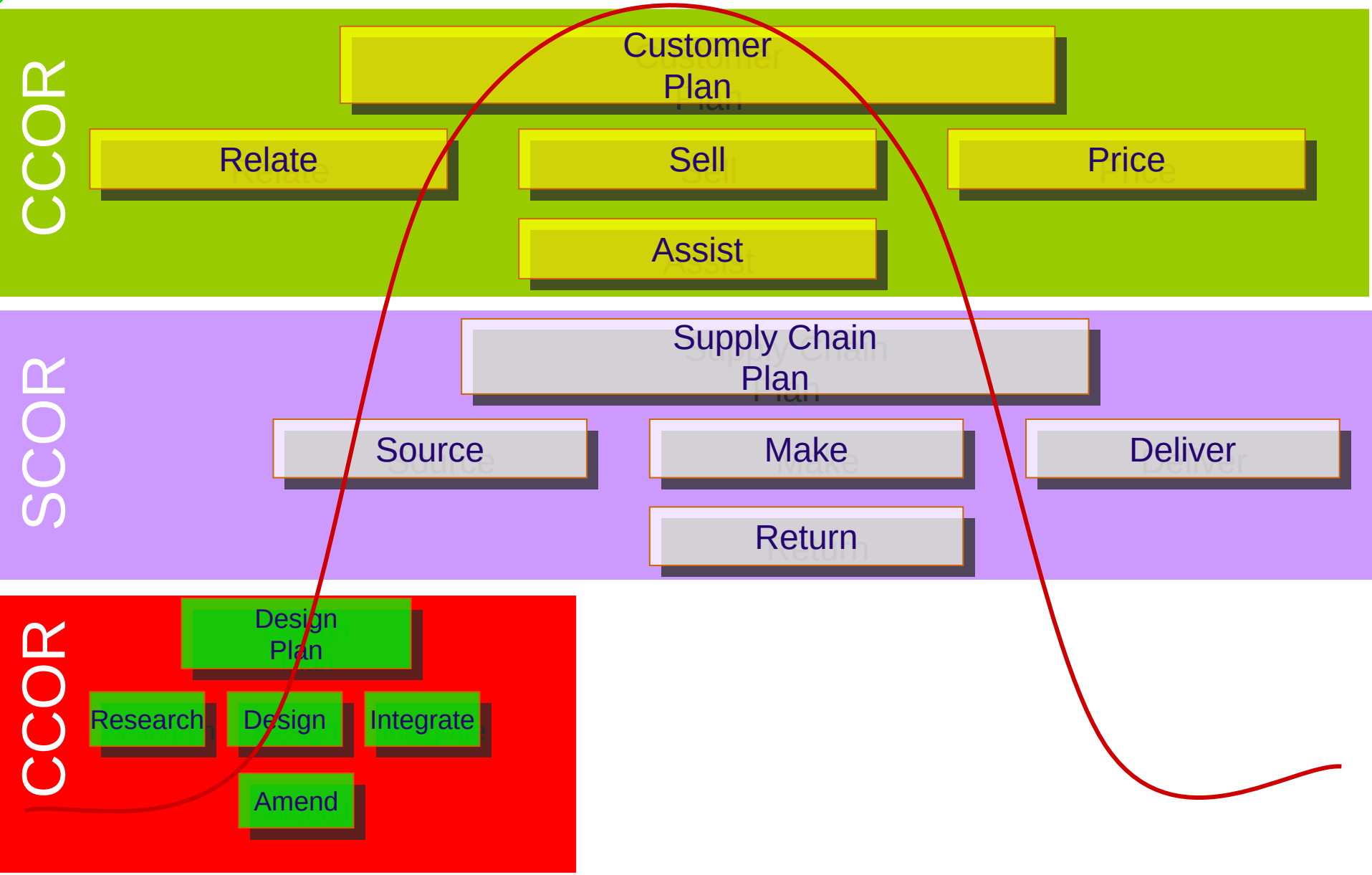
Integrated Business Reference Framework



The Components of a Business Framework

- DCOR spans the activities between customer requirements and the design or specification of a product to meet customer demand.
- SCOR spans the activities between recognition of demand through product delivery
- CCOR spans the activities associated with establishing and maintaining a customer relationship, identifying customer requirements and product support.

Integrated Business Reference Framework and the Product Life Cycle



Common Structure for Component Models (DCOR/SCOR/CCOR)

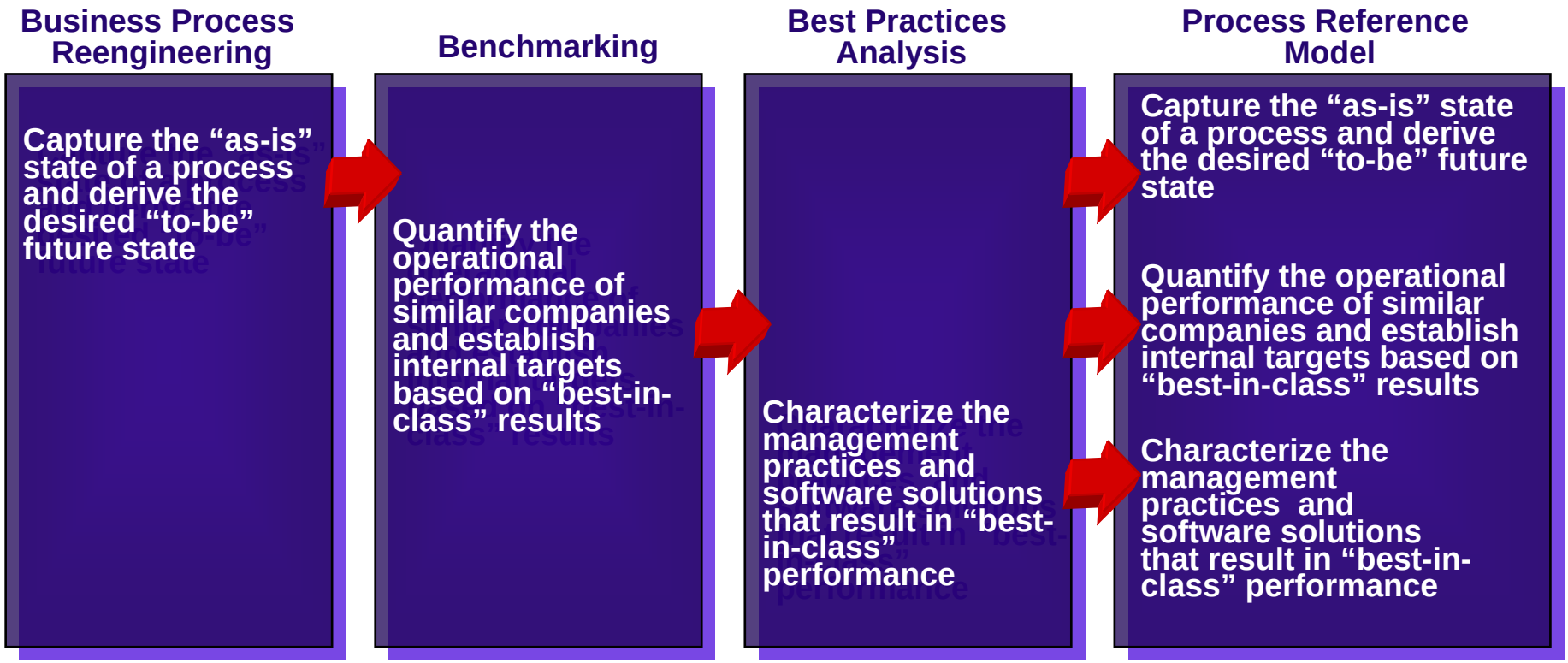
DCOR/SCOR and CCOR Built with Common Objectives and a Common Structure

- Objective - The performance of key processes must link directly to financial objectives.
- Objective – The primary purpose of the framework and the component models is to achieve business advantage through implementation.

- Structure - Measurements must be hierarchical to support cross-enterprise optimization while supporting the management of specific improvement activities.
- Structure - For measurement purposes, there must be clear boundaries between activities and organizations.
- Structure - Measurement must be tied to the activities they are designed to monitor.
- Structure - Processes must be hierarchical to allow cross-enterprise analysis and cross-industry generalization, while allowing organizations to describe the particular nuances in their businesses.
- Structure - Best practice must be linked to the processes that they support and the measurements which are used to determine the success of their implementation.
- Structure - Inputs and outputs describe the transactions between processes, documenting the origin and destinations of material, information, and finances. Inputs and outputs provide the mechanism for integrating and de-coupling the models within the framework.

What is a process reference model?

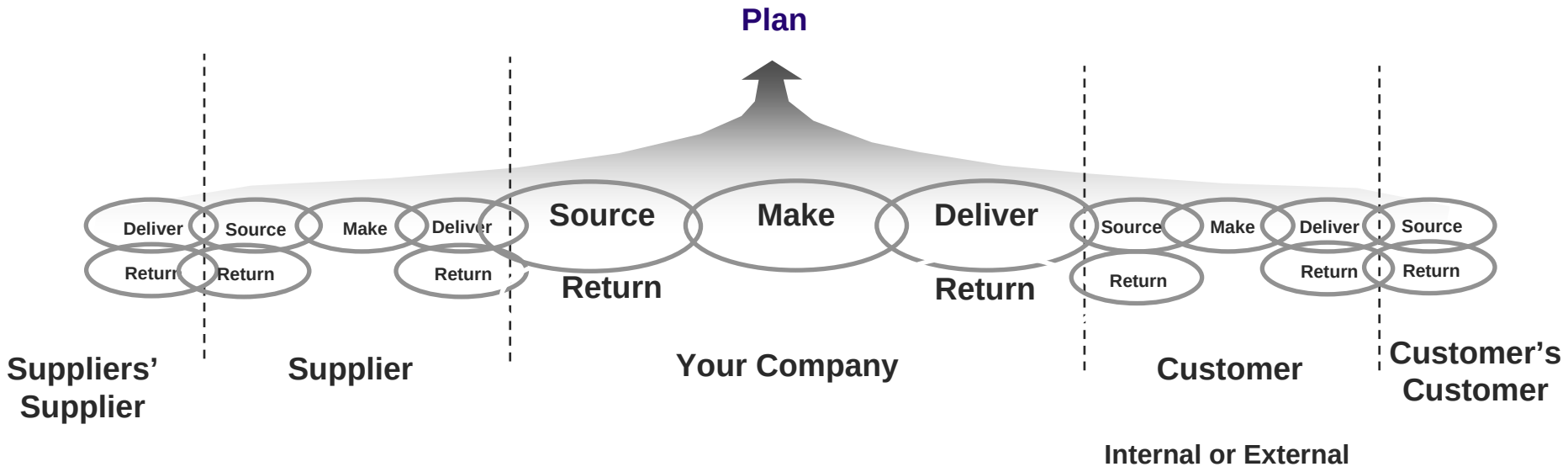
- Process reference models integrate the well-known concepts of business process reengineering, benchmarking, and process measurement into a cross-functional framework

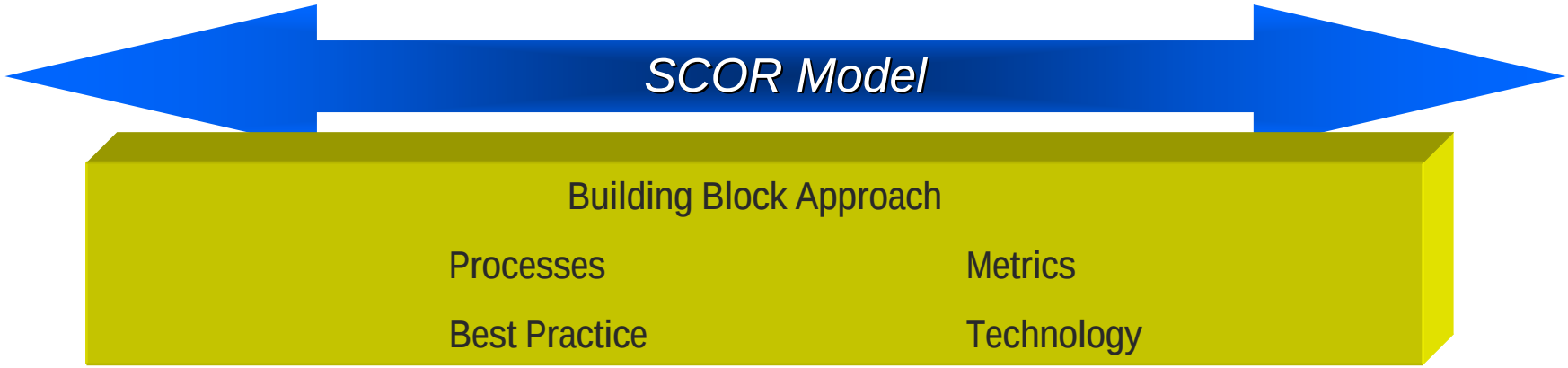


SCOR Boundaries

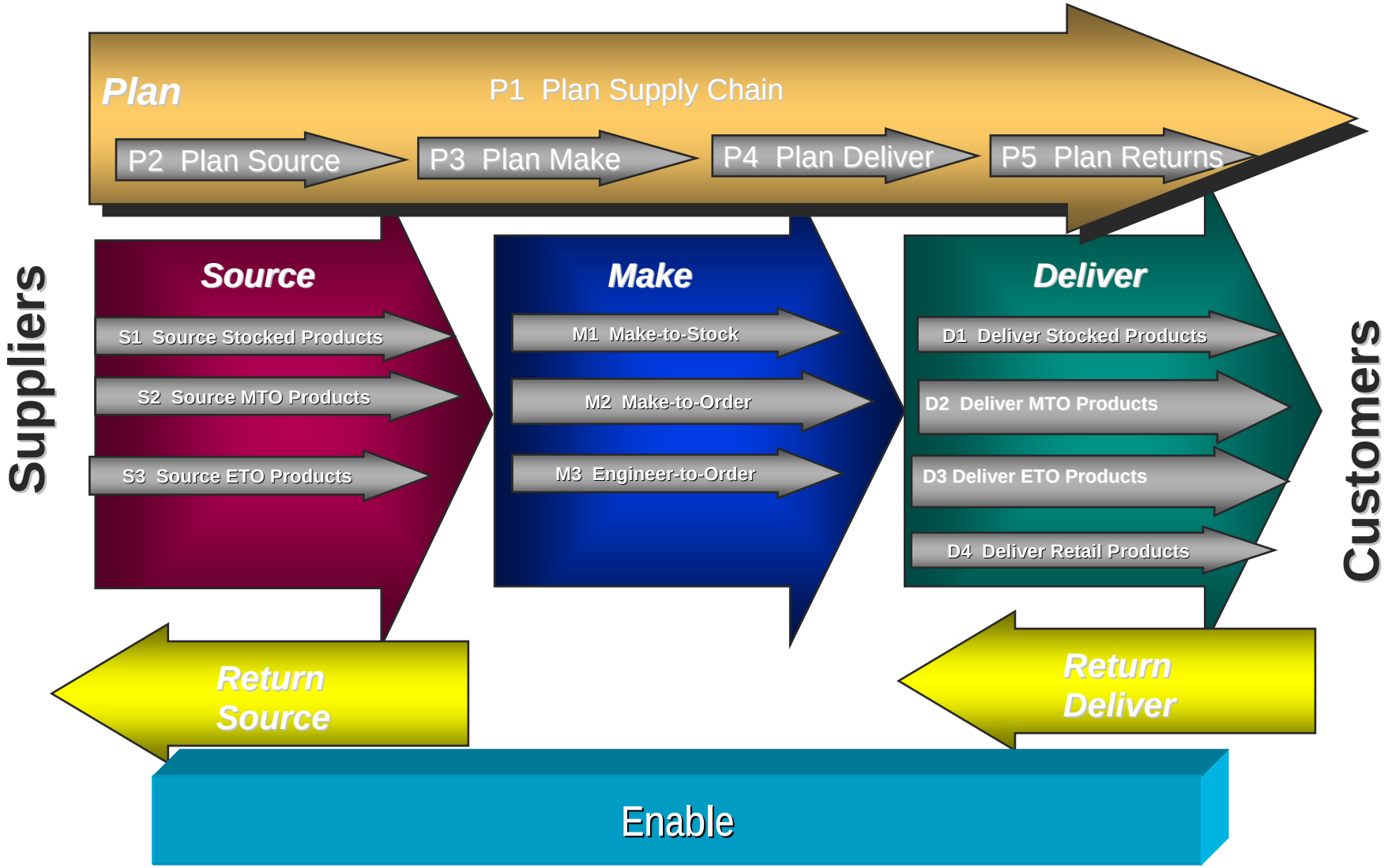
- SCOR Spans:
  - Order entry through paid invoice
  - Physical material transactions, financials, information flow
  - Market interactions
    - From the understanding of aggregate demand to the fulfillment of each order
  - Returns
- SCOR Considers but does not include process descriptions and measurement for related activities including:
  - Sales and Marketing
  - Research and Development / Product Design
  - QA
  - It

SCOR is structured around five distinct management processes





SCOR 7.0 – Processes
Level 2



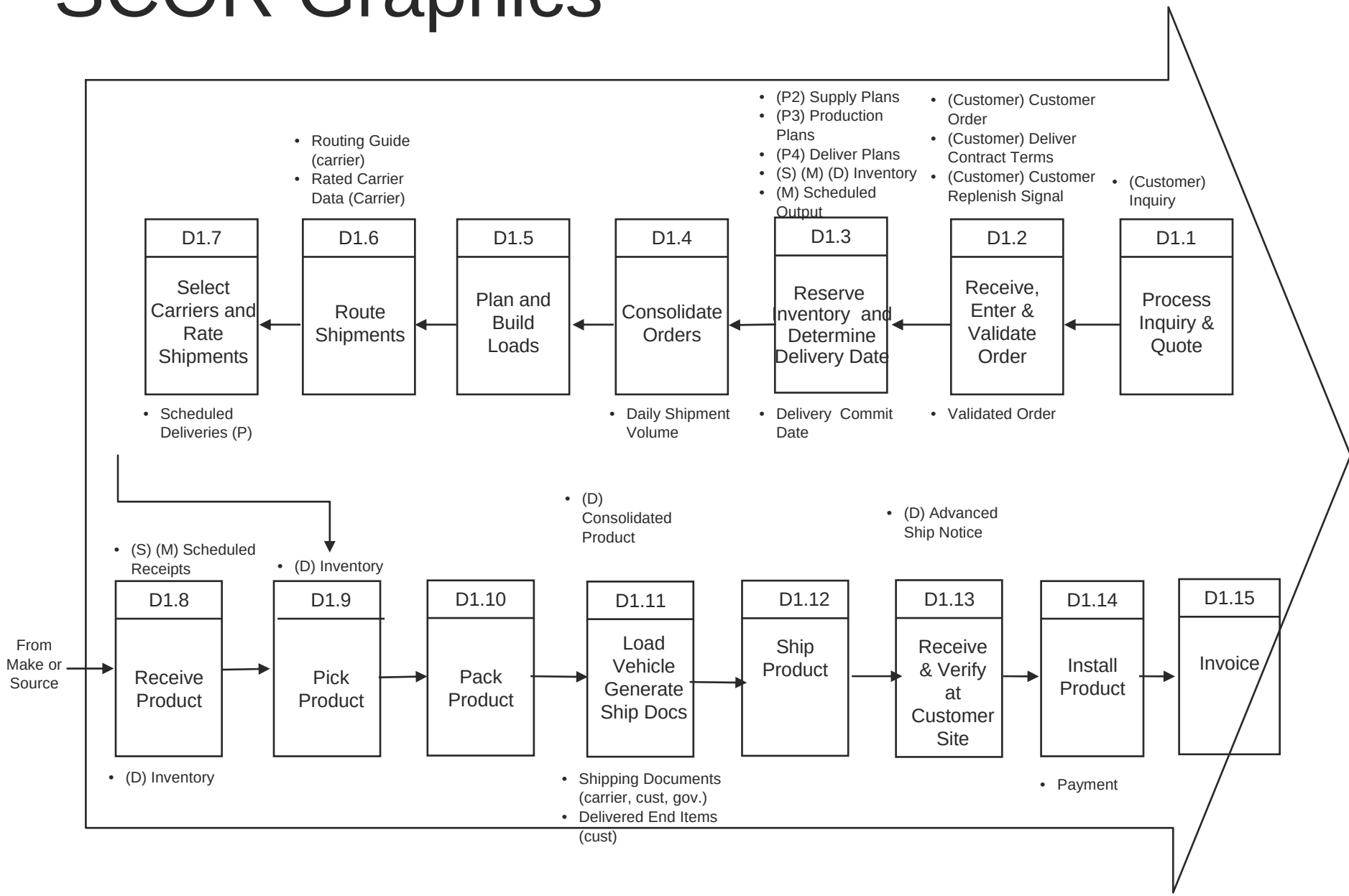
SCOR Process Tables

Process Element: Receive, Enter & Validate Order	Process Element Number: D1.2
Process Element Definition	
Receive orders from the customer and enter them into a company's order processing system. Orders can be received through phone, fax, or electronic media. "Technically" examine orders to ensure an orderable configuration and provide accurate price. Check the customer's credit. Optionally accept payment.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Receive, Enter and Validate Order Cycle Time
Flexibility	Upside Deliver Flexibility Downside Deliver Adaptability Upside Deliver Adaptability
Cost	Order cost / type of order Order Entry and Maintenance Costs as % of (S+M+D) cost
Assets	Return on Supply Chain Assets
Best Practices	**Features**
Electronic Commerce (customer visibility of stock availability, use of hand-held terminals for direct order entry, confirmation, credit approval), On-line stock check and reservation of inventory	EDI applications and integrated order management
Enable real-time visibility into backlog, order status, shipments, scheduled material receipts, customer credit history, and current inventory positions	None Identified
Continuous Replenishment Programs; Vendor Managed Inventory, Telemetry to automatically communicate replenishment of chemicals	Integrated demand/deployment planning to customer location driven by POS; Customer movement data
Remote (sales, customers) order entry capability	None Identified
Automatic Multi-level Credit Checking: Dollar Limits; Days Sales Outstanding; Margin Testing	Integrated Order/Financial Management
Value Pricing based on "Cost to Serve"; EDLP; Cost Plus Pricing	Activity Based Costing; Integrated Order Management by Customer by Line Item

Inputs	Plan	Source	Make	Deliver	Return
(Customer) Customer Order					
(Customer) Deliver Contract Terms					
(Customer) Customer Replenish Signal					

Outputs	Plan	Source	Make	Deliver	Return

SCOR Graphics



Common Metrics Structure for Component Models (DCOR/SCOR/CCOR)

Linking Supply Chain Performance Attributes and Level 1 Metrics

Performance Attribute	Performance Attribute Definition	Level 1 Metric
Supply Chain Reliability	The performance of the supply chain in delivering: the correct product, to the correct place, at the correct time, in the correct condition and packaging, in the correct quantity, with the correct documentation, to the correct customer.	Perfect Order Fulfillment
Supply Chain Responsiveness	The speed at which a supply chain provides products to the customer.	Order Fulfillment Cycle Time
Supply Chain Flexibility	The agility of a supply chain in responding to marketplace changes to gain or maintain competitive advantage.	Upside Supply Chain Flexibility
		Upside Supply Chain Adaptability
		Downside Supply Chain Adaptability
Supply Chain Costs	The costs associated with operating the supply chain.	Supply Chain Management Cost
		Cost of Goods Sold
Supply Chain Asset Management	The effectiveness of an organization in managing assets to support demand satisfaction. This includes the management of all assets: fixed and working capital.	Cash-to-Cash Cycle Time
		Return on Supply Chain Fixed Assets

Supply Chain Scorecard & Gap Analysis

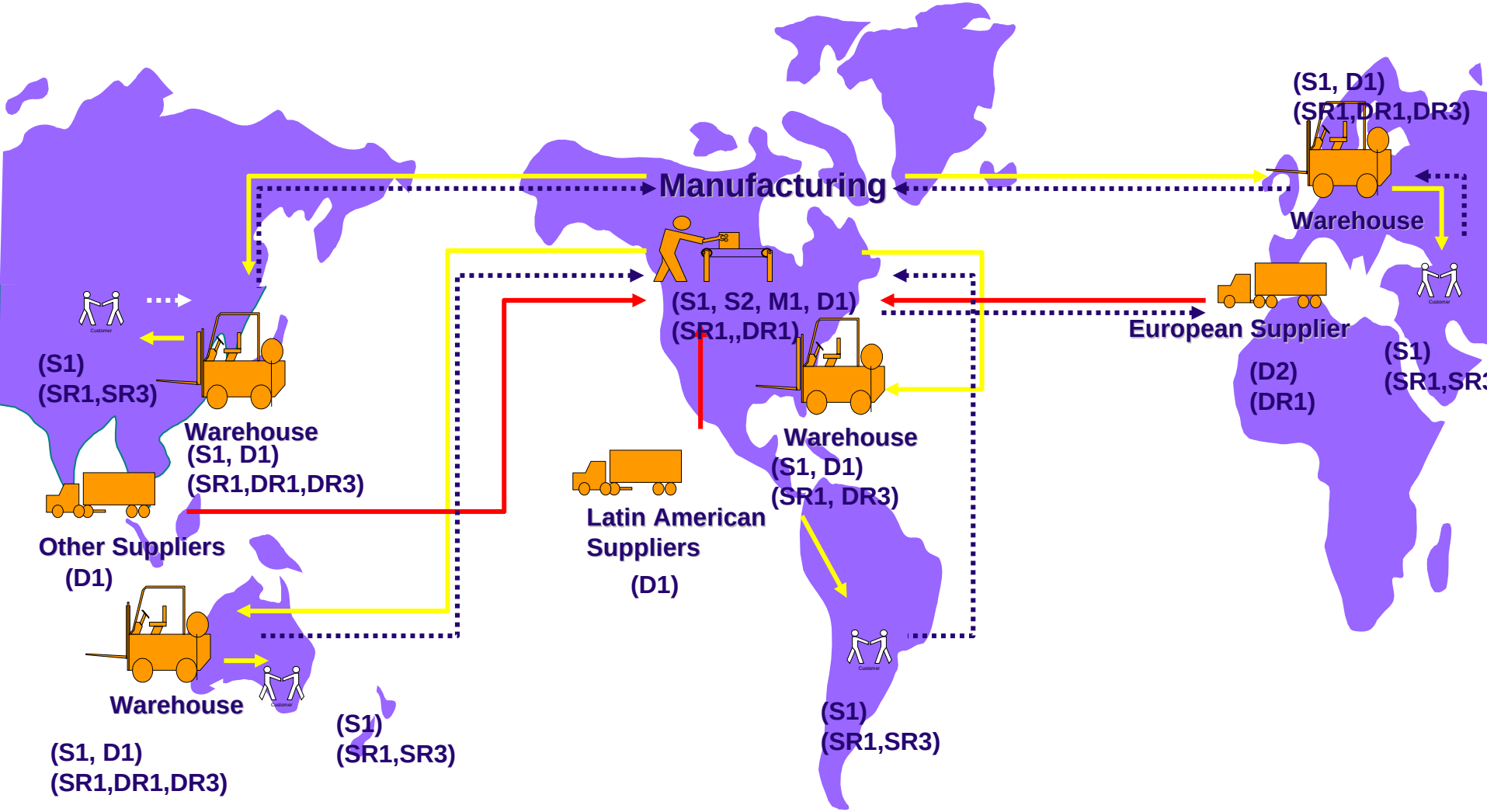
	Overview Metrics	SCOR Level 1 Metrics	Actual	Parity	Advantage	Superior	Value from Improvements
EXTERNAL	Supply Chain Reliability	Delivery Performance to Commit Date	50%	85%	90%	95%	
		Fill Rates	63%	94%	96%	98%	
		Perfect Order Fulfillment	0%	80%	85%	90%	$30M Revenue
	Responsiveness	Order Fulfillment Lead times	35 days	7 days	5 days	3 days	$30M Revenue
	Flexibility	Supply Chain Response Time	97 days	82 days	55 days	13 days	Key enabler to cost and asset improvements
		Production Flexibility	45 days	30 days	25 days	20 days	
INTERNAL	Cost	Total SCM Management Cost	19%	13%	8%	3%	$30M Indirect Cost
		Warranty Cost	NA	NA	NA	NA	NA
		Value Added Employee Productivity	NA	$156K	$306K	$460K	NA
	Assets	Inventory Days of Supply	119 days	55 days	38 days	22 days	NA
		Cash-to-Cash Cycle Time	196 days	80 days	46 days	28 days	$7 M Capital Charge
		Net Asset Turns (Working Capital)	2.2 turns	8 turns	12 turns	19 turns	NA

Common Implementation Methodologies for Component Models (DCOR/SCOR/CCOR)

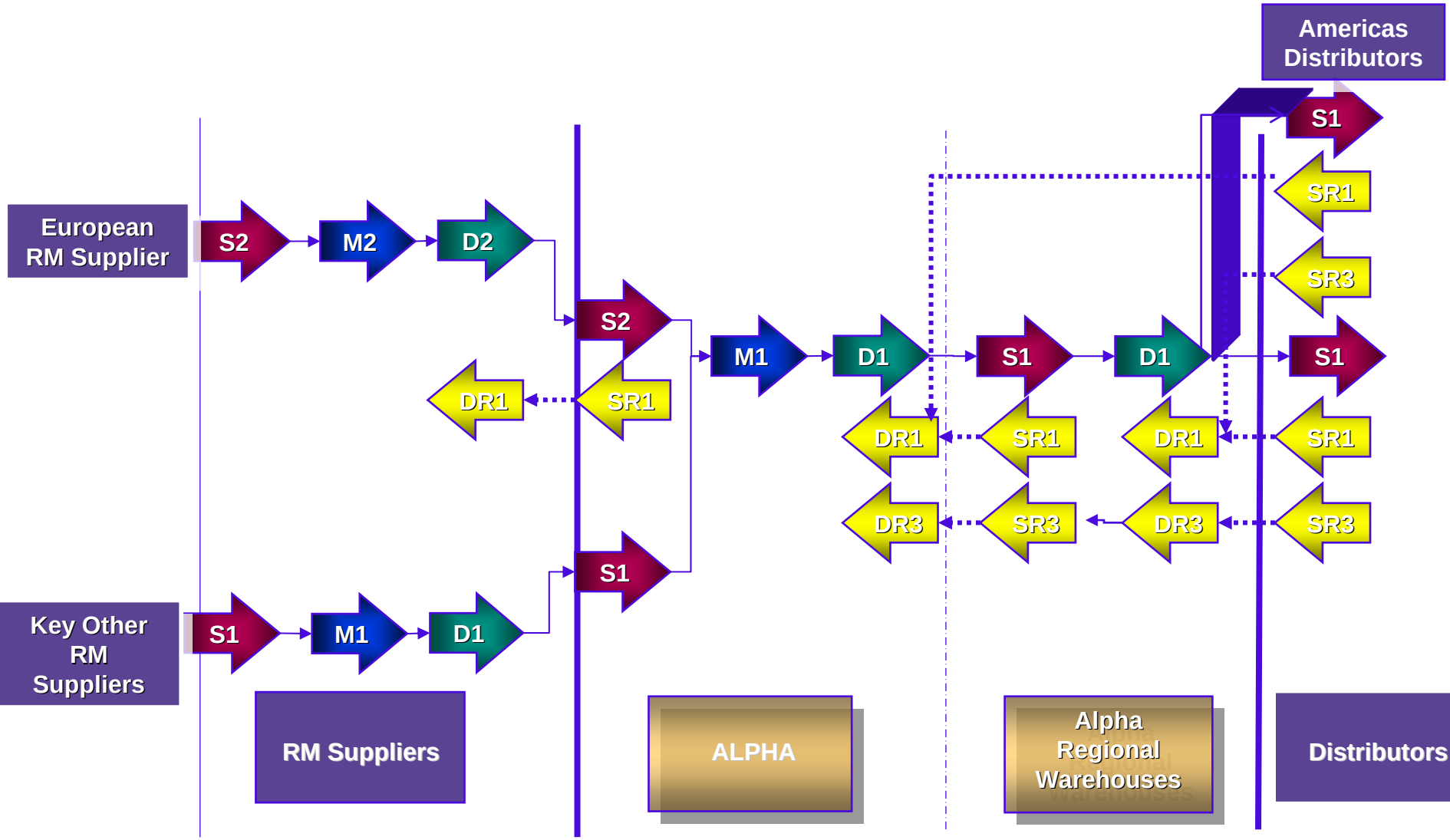
SCOR/DCOR/CCOR Implementation

- SCOR Implementations (Practitioner)
  - Vary in scope and objective
    - Green Field – Establishing a new supply chain
    - Distribution analysis – Implementing distribution strategy
    - Planning – Improving planning processes
    - Supply Chain Failure Analysis
    - Change Management / COTS-Consultant Selection
    - Information Technology
- SCOR Implementation (Academia)
  - Curriculum
  - Research Projects
- SCOR Implementation (Consultants)
- SCOR Implementation (Government)

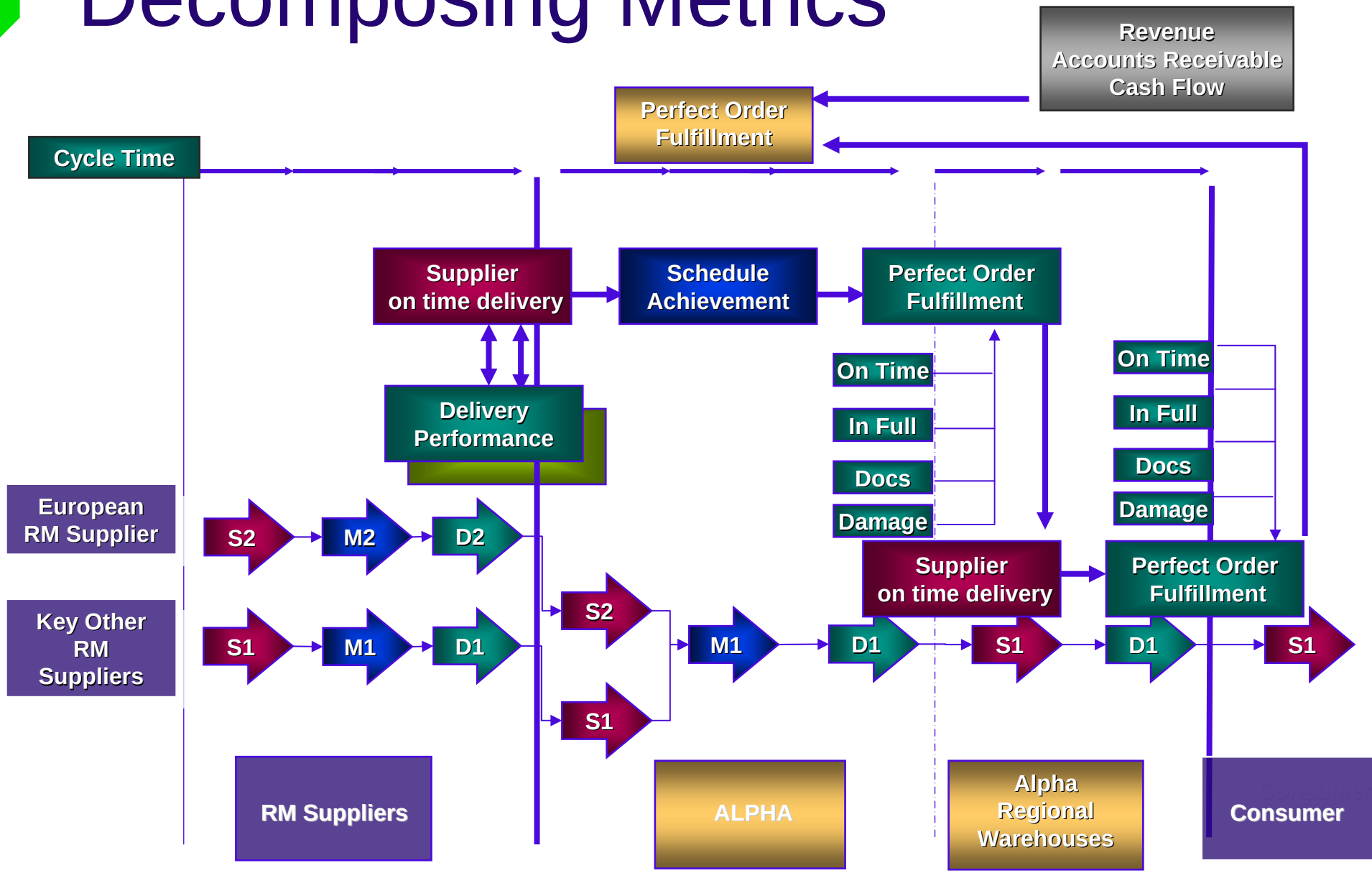
Mapping material flow



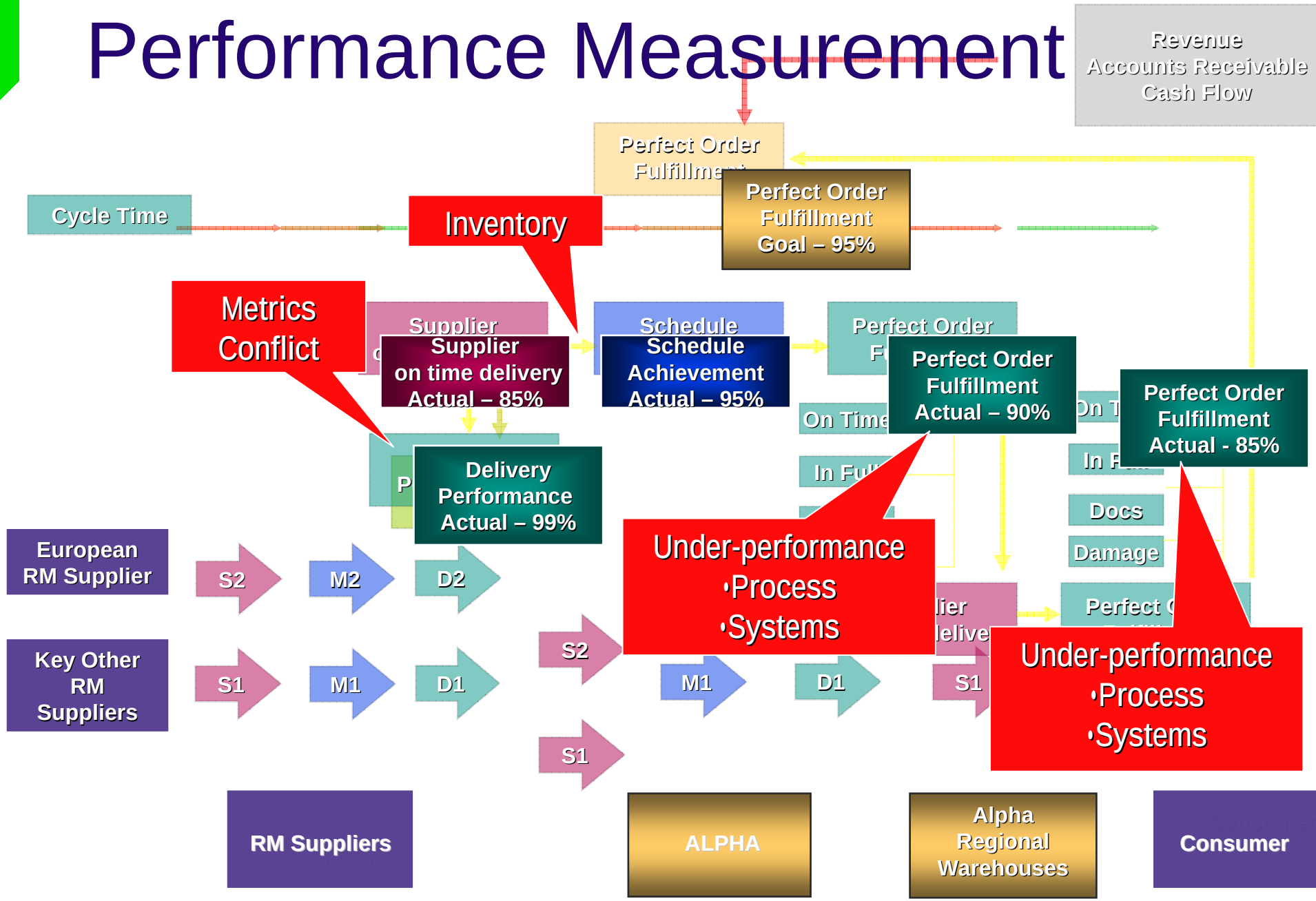
Mapping the execution processes



Decomposing Metrics

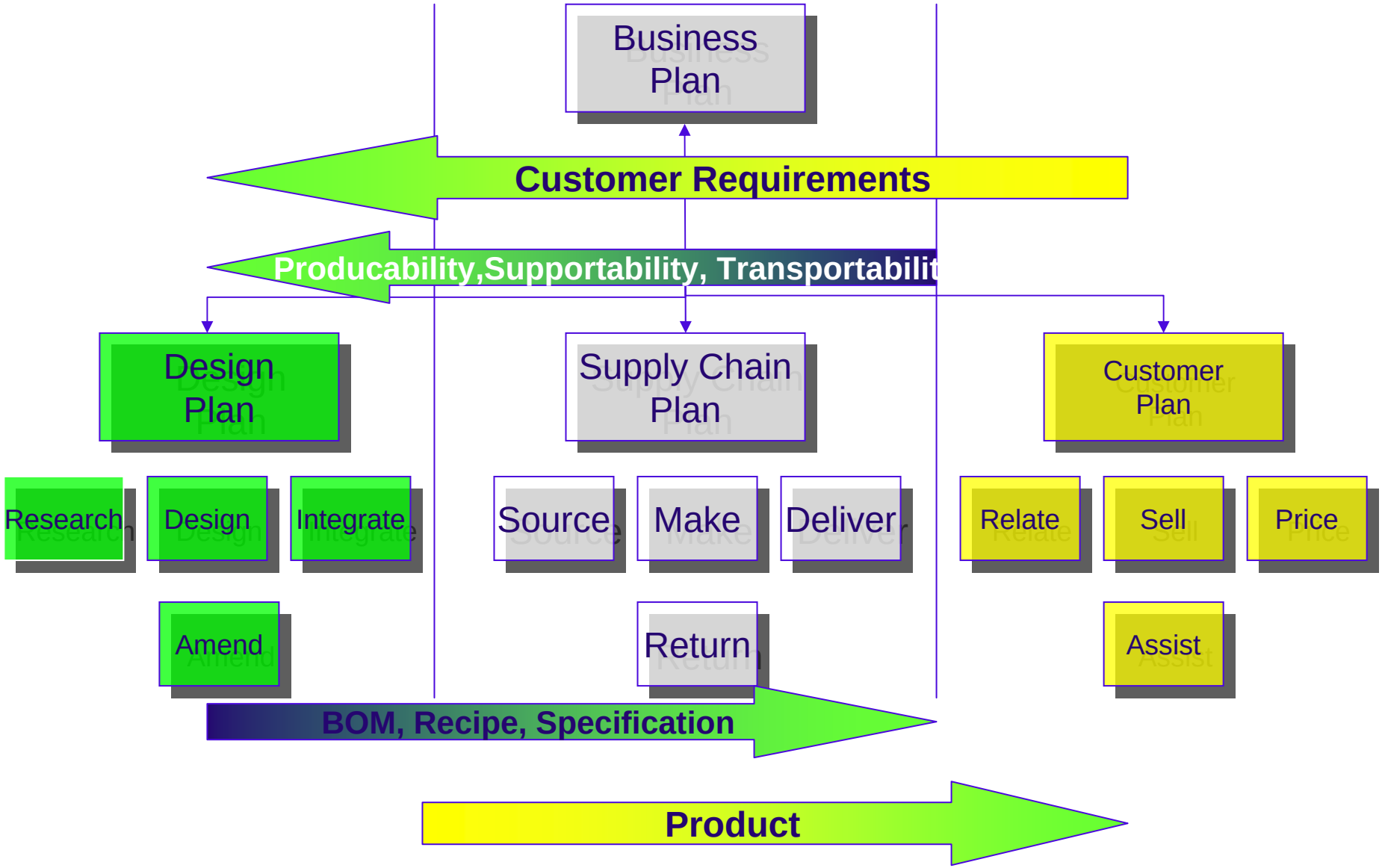


Performance Measurement



Component Models (DCOR/SCOR/CCOR) Linked by Inputs / Outputs, Best Practice, and Metrics

Integrated Business Reference Framework - Linkages



Component Models (DCOR/SCOR/CCOR) Loosely Integrated – Tightly Bundled

Design Philosophy

- Tight Bundle
  - Component Models work together to support analysis, measurement, and improvement of the end-to-end product life cycle
  - Models used together will better support analysis and measurement of complex activities
    - Time to Market
    - Time to Volume
- Loose Integration
  - Component Models are separable so organizations can use individual Models of interest without the others
  - Component Models can be separately improved based on advances in specific disciplines

SCOR Release History

1997 — **Version 1.0**
First version of the Model, Plan, Source, Make, Deliver, metrics, best practice, and technology

1998 — **Version 2.0**
Model modified to reconcile distinctions between discrete and process industries

1999 — **Version 3.0**
Model modified to enhance inputs and outputs and infrastructure elements. Specific reference to software products removed.

2000 — **Version 3.1**
Restructured infrastructure / enable elements.
Restructuring of metrics begun – definitions of performance attributes developed.
Language to support services as well as tangible goods provided

2001 — **Version 4.0**
Restructuring of infrastructure enable elements completed. Returns introduced.

2002 — **Version 5.0**
Returns processes introduced. E-business practices updated Metrics re-structuring continued

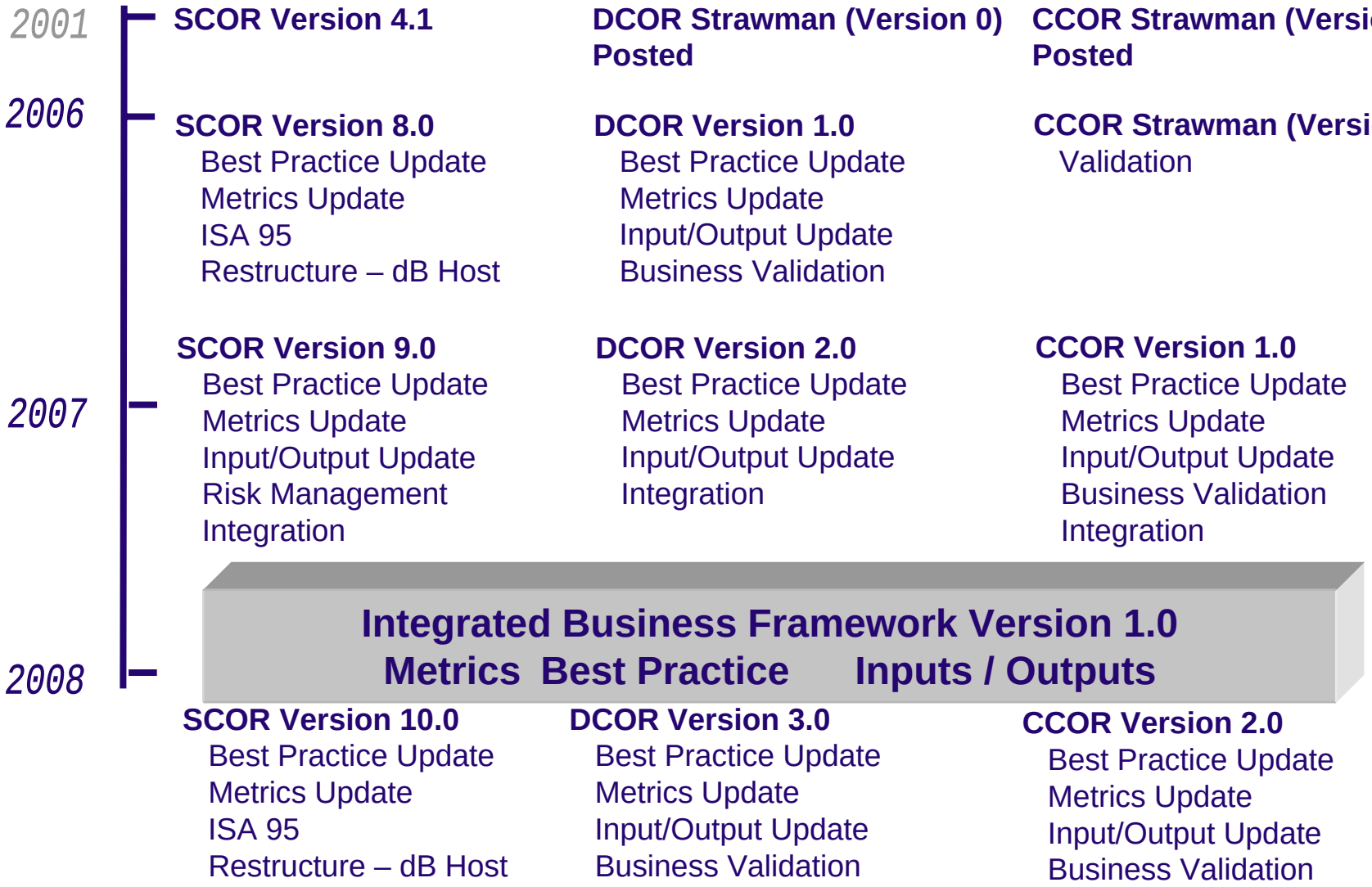
2003 — **Version 6.0**
Retail D4, revamped MRO, Make e-biz best practices

2004 — **Version 6.1**
Updated Return, Best Practices

Current Technical Projects

- SCOR Rehost
  - Release 8.0
    - XML / HTML
    - Access
    - Word
    - Excel
- DCOR
  - Version 1.0
- Best Practice
- Metrics
- ISA 95

Integrated Business Reference Framework Release Plan



Component Models (DCOR/SCOR/CCOR) Design Philosophy Supports Common Tools and IT

Common Tools

www.supply-chain.org

info@supply-chain.org