

M U N I

SCOR model

Definice procesů pro SC design

Procesní rámce pro SCM

- SCOR model (Supply chain operation reference model vytvořený Supply chain council)
- GSCF model (Global supply chain forum model vytvořený Supply chain management institute)
- Jejich smyslem je snaha o uspokojení potřeb zákazníka
- Identifikují procesy v rámci SCM, které mohou být implementovány a hodnocení organizací
- Rozdíl mezi nimi – GSCF zachycuje všechny podnikové funkce,

SCOR

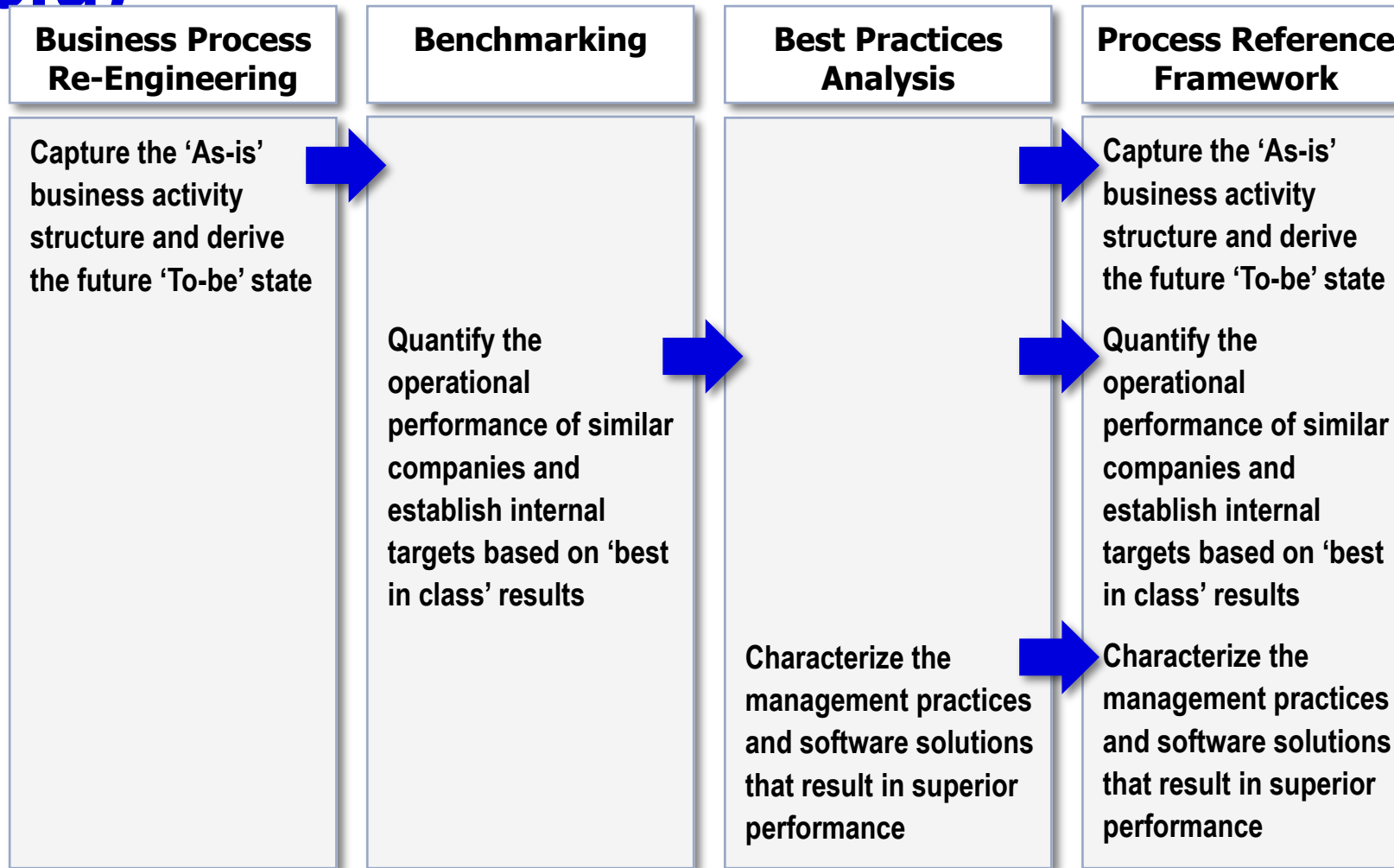
- Jedná se o procesní referenční model,
- Reference models are generic conceptual models that formalise recommended practices for a certain domain
- Process reference model - represents dynamic aspects of an enter-prise, e.g. activity sequences, organizational activities required to satisfy customer needs, control-flows between activities, particular dependency constraints. To use a particular reference model, it must be adapted to the requirements of a particular enter-prise.

(14) (PDF) Business Process Reference Models: Survey and Classification. Available from:
https://www.researchgate.net/publication/221585953_Business_Process_Reference_Models_Survey_and_Classification [accessed Mar 24 2021].

SCOR model

- product of Supply Chain Council, Inc, nezisková organizace, vytvořený v roce 1996
- evaluating and comparing supply chain activities and performance.
- It provides a unique framework that links business process, metrics, best practices and technology into a unified structure to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities.

Combines Best Techniques (hlavní pilíře modelu)



– 3 techniques become 1 integrated approach

SCOR

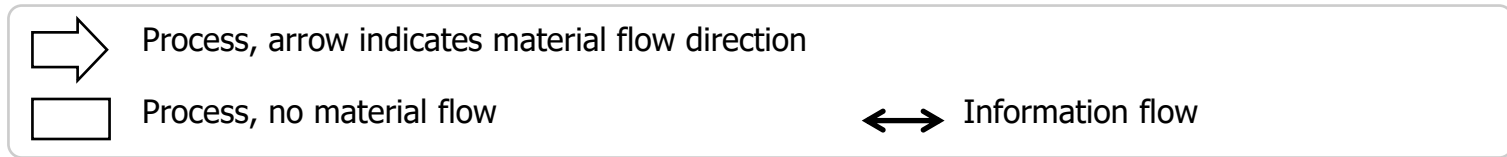
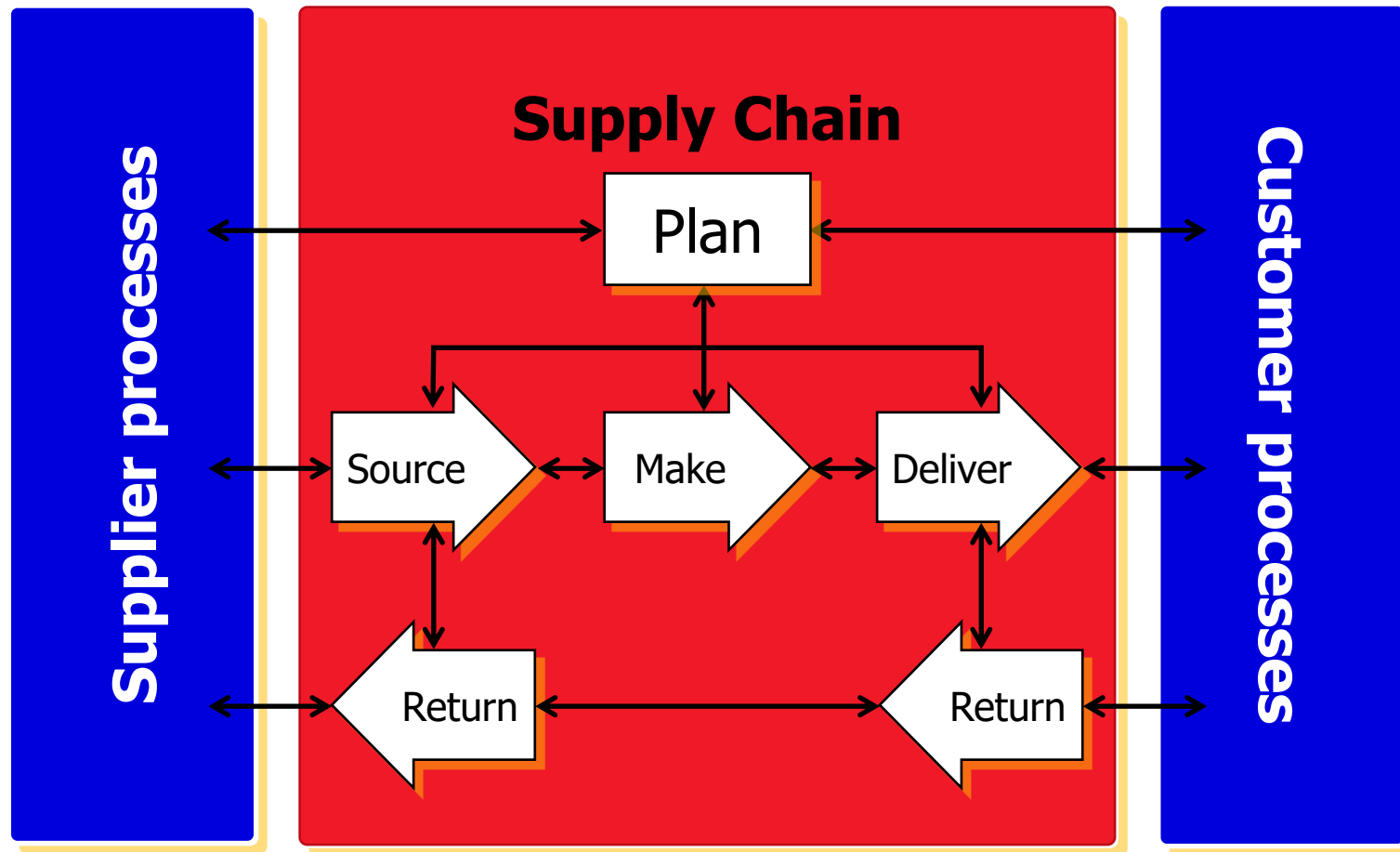
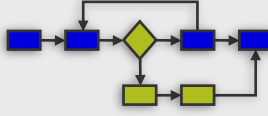


TABLE 5.1 Six Processes in the APICS Supply Chain Operations Reference (SCOR) Model

SCOR Process	Definition
Plan	Processes that balance aggregate demand and supply to develop a course of action which best meets sourcing, production, and delivery requirements.
Source	Processes that procure goods and services to meet planned or actual demand.
Make	Processes that transform product to a finished state to meet planned or actual demand.
Deliver	Processes that provide finished goods and services to meet planned or actual demand, typically including order management, transportation management, and distribution management.
Return	Processes associated with returning or receiving returned products for any reason. These processes extend to post delivery customer support.
Enable	Processes that manage relationships, performance, and information for a supply chain. These processes interact with all other internal and external processes associated with supply chain.

Source: APICS SCOR Model, Chicago, IL: APICS (www.apics.org)

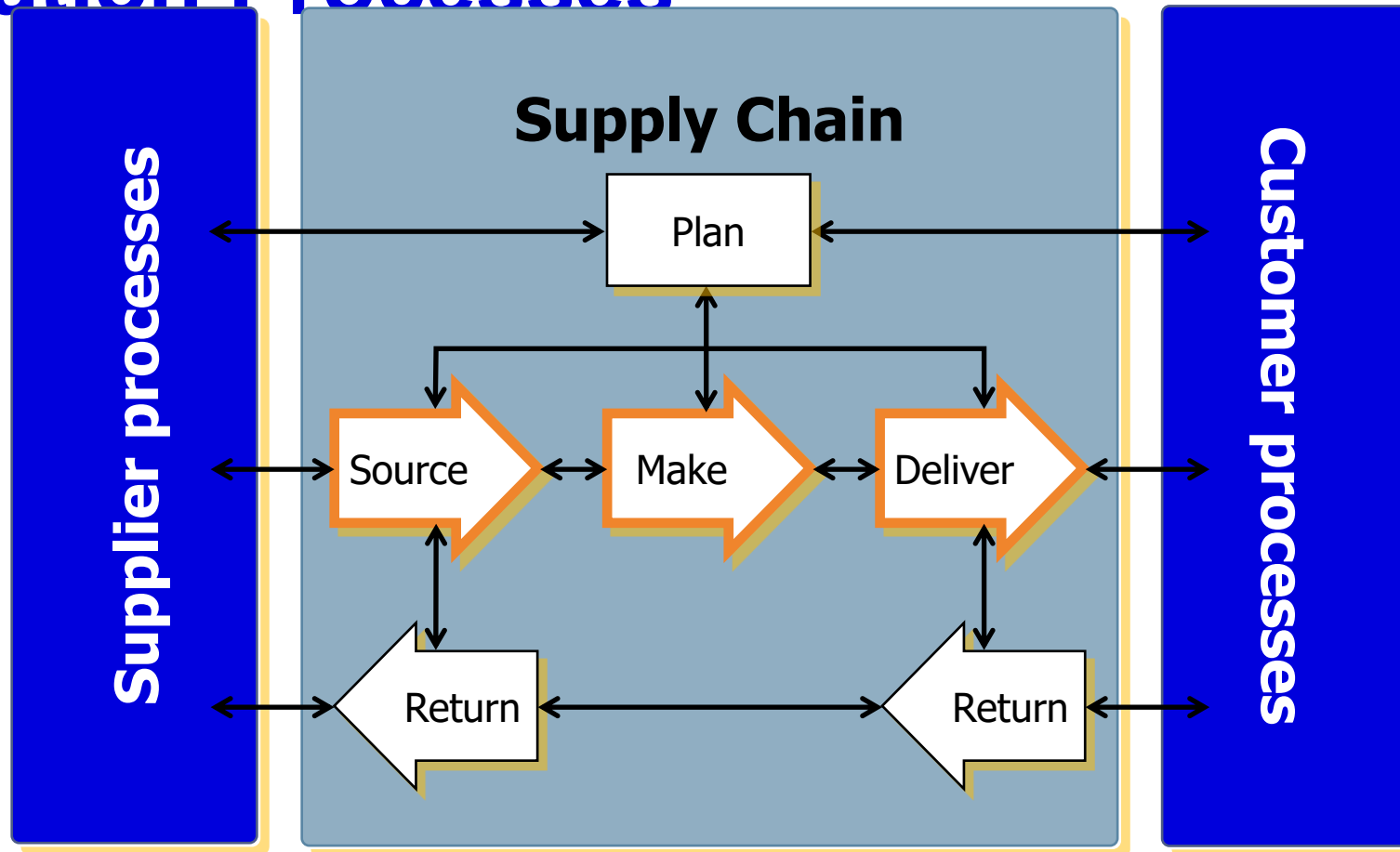
SCOR Hierarchy

Level 1	Level 2	Level 3	Level 4	Level 5
Scope	Configuration	Activity	Workflow	Transactions
S Source	S1 Source Stocked Product	S1.2 Receive Product		EDI XML
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 Language	Technology Specific Language

Standard SCOR practices Company/Industry definitions

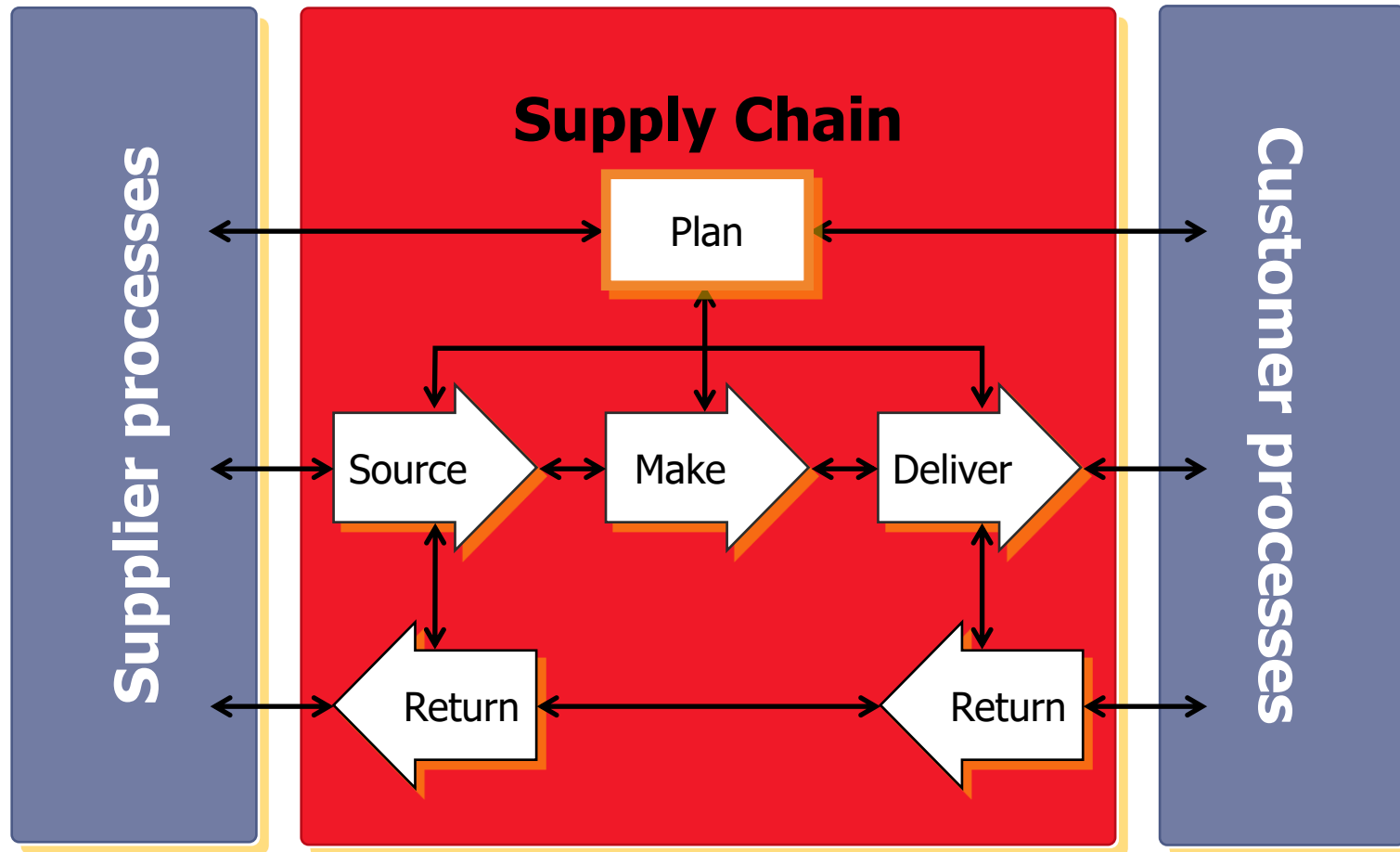
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Execution Processes



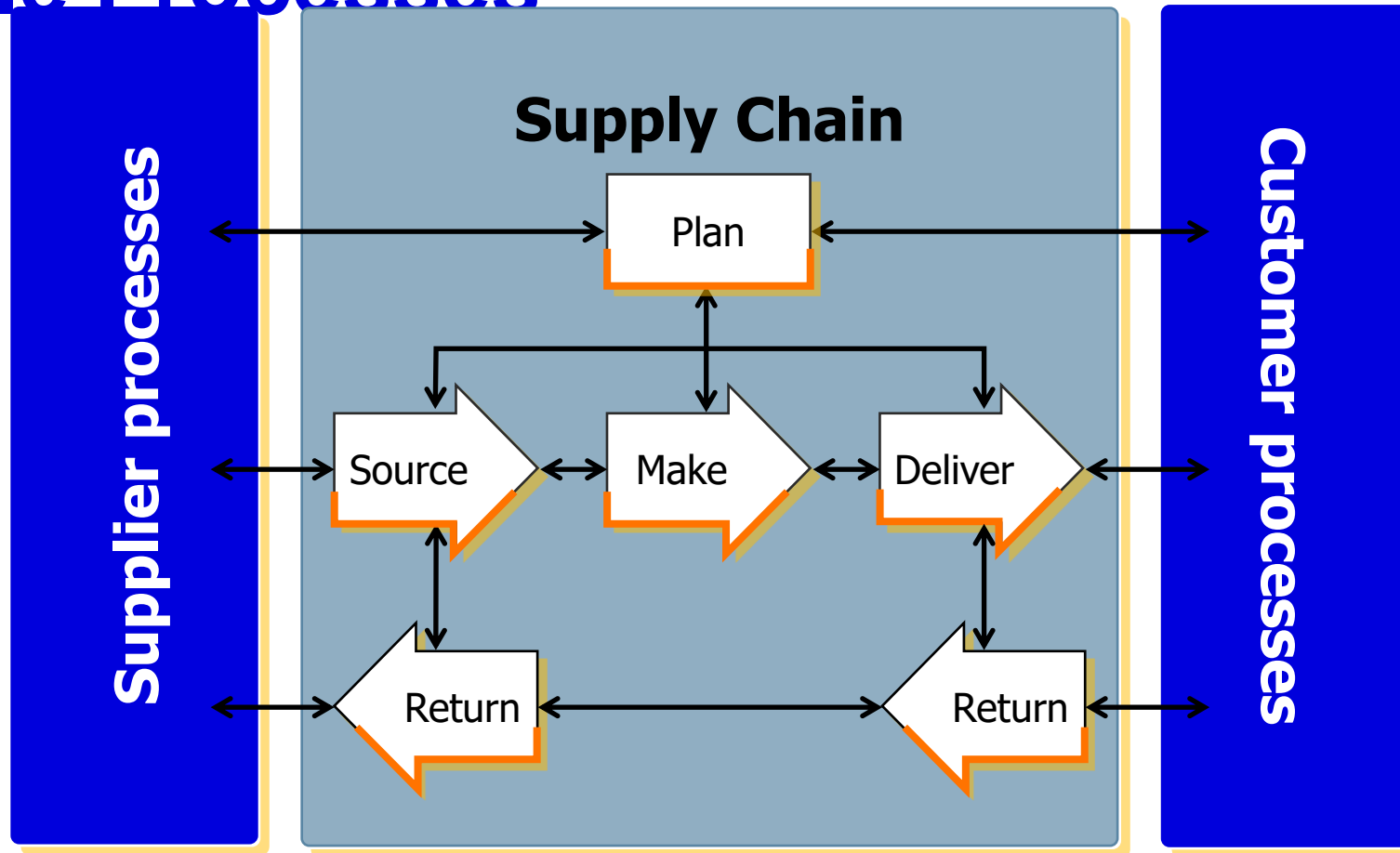
- Processes: Source, Make and Deliver
- Objective: value-add, revenue generating

Planning Processes



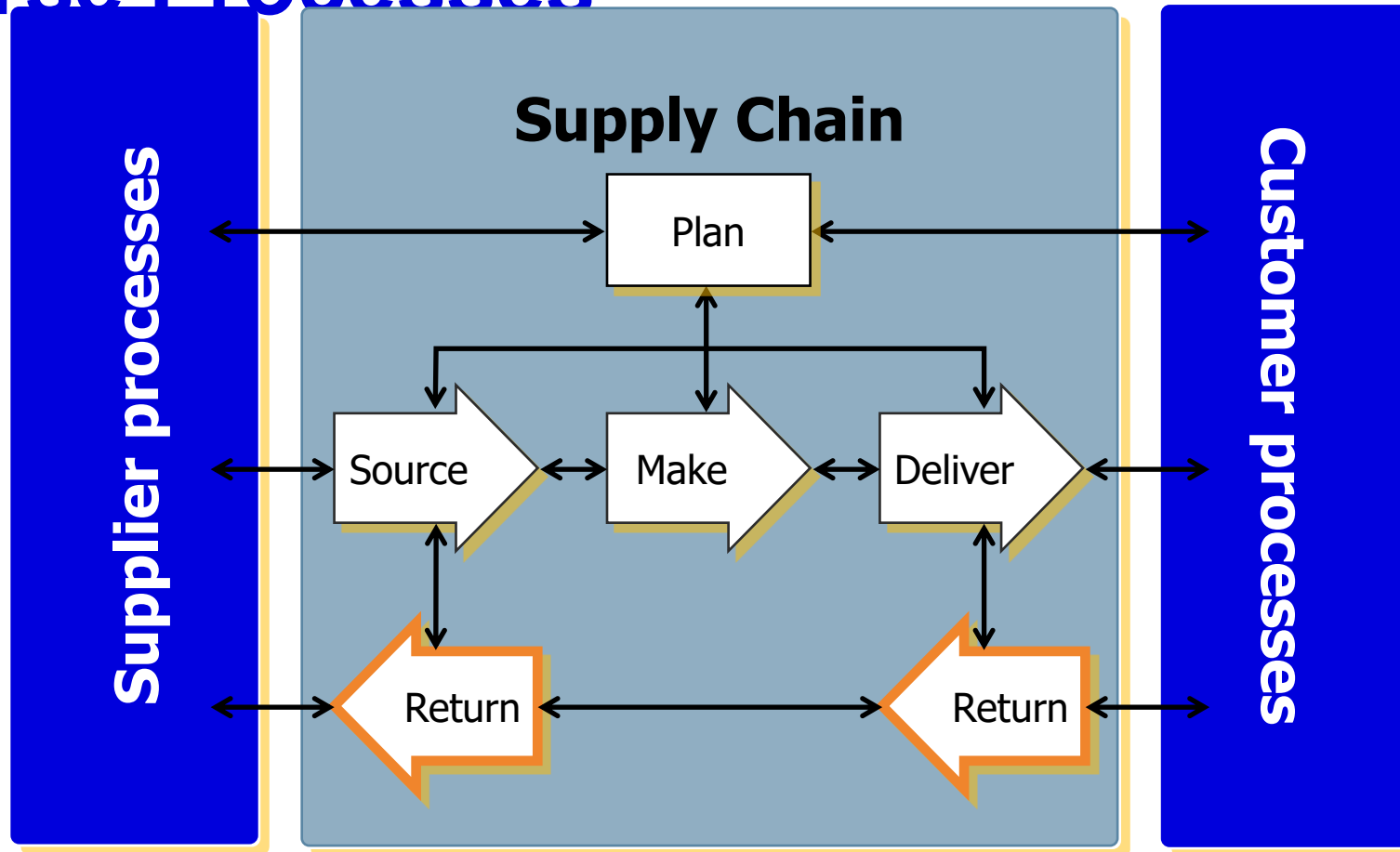
- Processes: Plan
- Objective: Drive/coordinate execution processes

Enable Processes



- Processes: Enable Plan, Enable Source, Enable Make, Enable Deliver and Enable Return

Reverse Processes



- Processes: Return (Source Return, Deliver Return)
- Objective: reverse material flows

Příklad: Source (Process ID: S)

- Objectives of this process:
 - The ordering, delivery, receipt and transfer of raw material items, subassemblies, product and/or services.
 - Key processes comprehended:
 - Schedule product deliveries
 - Receive, inspect, and hold materials
 - Issue material to Make or Deliver processes
 - Supplier/Vendor Agreements
 - Vendor certification and feedback, sourcing quality
 - Manage Raw Materials inventories
 - Freight, import/export documentation
- Hint: Receiving processes? Probably

Source in SCOR



Source Process Elements

Stocked Product (S1)	Make-to-Order (S2)	Engineer-to-Order (S3)
		S3.1 Identify Sources of Supply
		S3.2 Select Final Supplier(s) and Negotiate
S1.1 Schedule Product Deliveries	S2.1 Schedule Product Deliveries	S3.3 Schedule Product Deliveries
S1.2 Receive Product	S2.2 Receive Product	S3.4 Receive Product
S1.3 Verify Product	S2.3 Verify Product	S3.5 Verify Product
S1.4 Transfer Product	S2.4 Transfer Product	S3.6 Transfer Product
S1.5 Authorize Supplier Payment	S2.5 Authorize Supplier Payment	S3.7 Authorize Supplier Payment

Make (Process ID: M)

- Objectives of this process:
 - The process of adding value to products through mixing, separating, forming, machining, and chemical processes.
- Key Processes Comprehended:
 - Schedule production, request and receive material from Source and/or Make processes
 - Manufacture, assemble/disassemble and test product, package, hold/release product
 - Managing product quality and engineering changes
 - Managing facilities and equipment, production status workflow and capacity management
 - Manage Work-In-Process (WIP) inventories
- Hint: Itemnumber change? Probably Make in S



Make Process Elements

Make-to-Stock (M1)	Make-to-Order (M2)	Engineer-to-Order (M3)
		M3.1 Finalize Production Engineering
M1.1 Schedule Production Activities	M2.1 Schedule Production Activities	M3.2 Schedule Production Activities
M1.2 Issue Material	M2.2 Issue Sourced/In-Process Product	M3.3 Issue Sourced/In-Process Product
M1.3 Produce and Test	M2.3 Produce and Test	M3.4 Produce and Test
M1.4 Package	M2.4 Package	M3.5 Package
M1.5 Stage Product	M2.5 Stage Finished Product	M3.6 Stage Finished Product
M1.6 Release Product to Deliver	M2.6 Release Finished Product to Deliver	M3.7 Release Product to Deliver
M1.7 Waste Disposal	M2.7 Waste Disposal	M3.8 Waste Disposal

Deliver (Process ID: D)

– Objectives of this process:

- Perform customer-facing order management and order fulfillment activities including outbound logistics.

– Key processes comprehended:

- Product, service and price quotations
- Order entry and maintenance
- Order consolidation, picking, packing, labeling and shipping
- Import/export documentation
- Customer delivery and installation
- Logistics and Freight Management
- Manage Finished Goods inventories

– Hint: Order taking or Shipping? Probably Delive



Control processes: Plan, Enable

- Plan and Enable processes prepare the supply-chain to ensure smooth execution
- Planning processes balance the need for resources, materials, capacity, etc. with the availability of these resources. This includes prioritization if needed.
- Enable processes address 8 control aspects for the supply chain. They monitor compliance, deliver information from other process areas and highlight dependencies on these other process areas. They also support maintenance of relationships with suppliers.



Plan (Process ID: P)

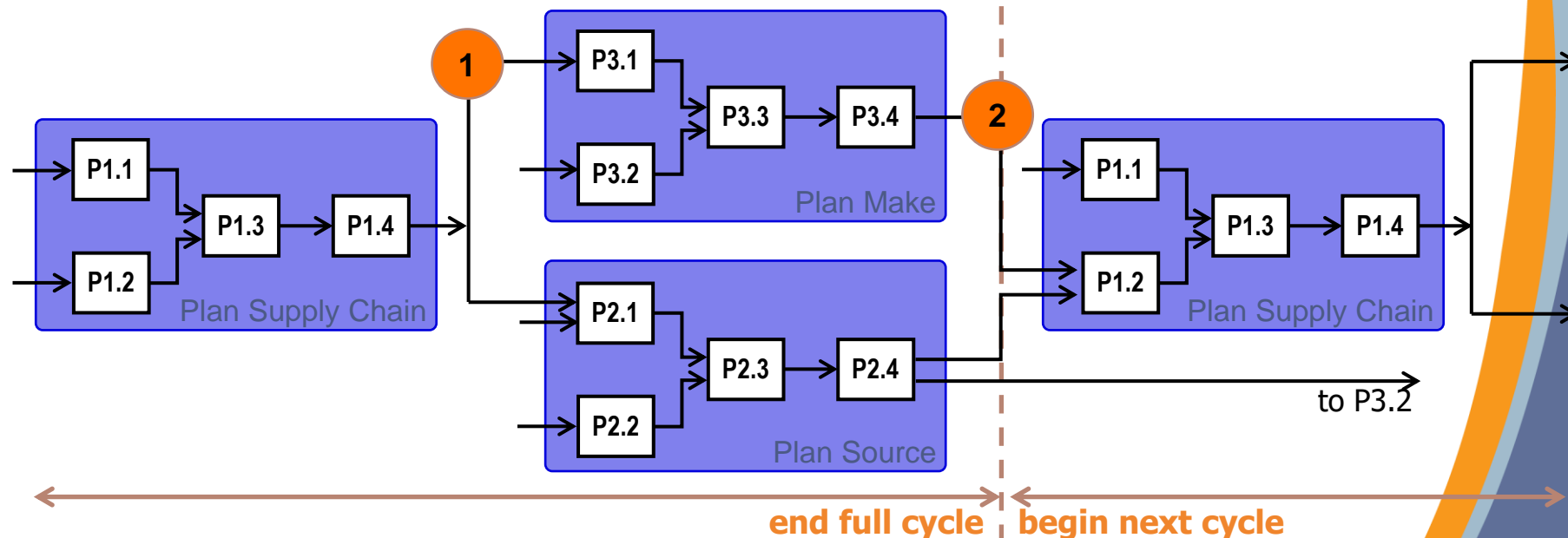
- Objectives of this process:
 - The process of determining requirements and corrective actions to achieve supply chain objectives
- Key Processes Comprehended:
 - Supply chain revenue planning/forecasting
 - Materials requirement planning
 - Factory, repair, maintenance facilities capacity planning
 - Distribution requirements planning
 - Manage planning parameters
- Hint: Forecasting, S&OP, MRP?

Probably Plan in SCOR



Plan Processes

- Planning is an iterative process:
 1. The output of Plan Supply Chain is the input for Plan Source, Plan Make, Plan Deliver and Plan Return
 2. The output of Plan Source, Plan Make, Plan Deliver and Plan Return are inputs for Plan Supply Chain; The output of one cycle is the input for the next cycle



Enable Processes

– Objective:

The Enable processes are five groups of processes under Plan, Source, Make, Deliver and Return with

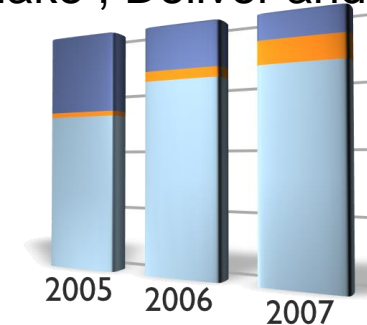
3 distinct types of objectives:

1. Manage process performance
2. Manage process control data
3. Manage process relationships

– Key processes comprehended:

- Managing business rules and monitoring adherence
- Measuring supply chain performance and determine corrective action
- Managing risk and environmental impact
- Managing the supply chain network and facilities

– Hint: Equipment or plant maintenance? Probably Enable



Return (Process ID: R)

– Objective of this process:

- Moving material from customer back through supply chain to address defects in product, packaging, or manufacturing, or to perform upkeep activities.

– Key Processes Comprehended

- Identification of the need to return a product or asset
- Requesting and issuing return authorization
- Inspection and disposition decision-making
- Transfer/Disposition of product or asset
- Managing return transportation capacity
- Managing returned material inventories

– Hint: Reverse material flow? Probably Return in SCOR



Return Configurations

- Return Defective Products (Process IDs: SR1 and DR1)
 - The return of products because the product is defective, the wrong product was ordered or shipped.
- Return Maintenance, Repair & Overhaul (IDs: SR2 and DR2)
 - The return of products or assets to perform preventative maintenance, (end-of-life) overhaul or repairs due to breakage/aging with use
- Return Excess Products (Process IDs SR3 and DR3)
 - The return of excess inventories and inventories of product which will be retired (end-of-life excess). The product is new and in original packaging.
- SR = Source Return, DR = Deliver Return

Performance Attributes

	Attribute	Strategy
Customer	Reliability (RL)	Consistently getting the orders right, product meets quality requirements
	Responsiveness (RS)	The consistent speed of providing products/services to customers
	Agility (AG)	The ability to respond to changes in the market (external influences)
Internal	Cost (CO)	The cost associated with managing and operating the supply chain
	Assets (AM)	The effectiveness in managing the supply chain's assets in support of fulfillment

Question: What is/are the most important attributes to achieve your supply chain strategy?

KPIs; Strategic Metrics

- Measuring strategy: KPIs are strategic (level 1)
- Diagnostic SCOR metrics
 - Level 2- Linked to business objectives
 - Highlight the gap in performance
 - Change over time is more valuable than a single sample

	Attribute	Strategic metric
Customer	Reliability	RL.1.1 Perfect Order Fulfillment
	Responsiveness	RS.1.1 Order Fulfillment Cycle Time
	Agility	AG.1.1 Upside Supply Chain Flexibility
		AG.1.2 Supply Chain Upside Adaptability
		AG.1.3 Supply Chain Downside Adaptability
	Internal	Cost
CO.1.2 Cost of Goods Sold		
Assets		AM.1.1 Cash-to-Cash Cycle Time
		AM.1.2 Return on Supply Chain Fixed Assets
		AM.1.3 Return on Working Capital

Strategic Reliability Metric

Metric: **RL.1.1 Perfect Order Fulfillment**

Definition: The percentage of orders delivered on-time, in full. Components of perfect include all items and quantities on-time, using the customer's definition of on-time, complete documentation and in the right condition



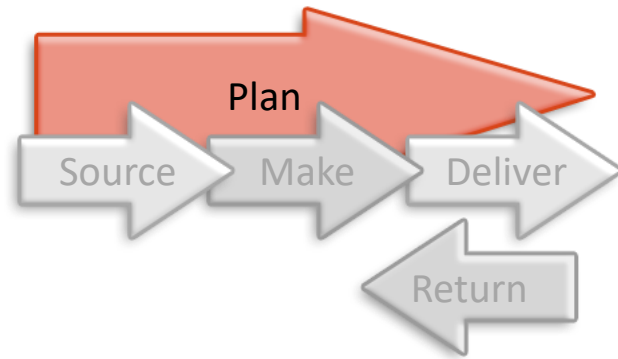
Calculation: $[\text{Total Perfect Orders}] / [\text{Total Number of Orders}]$

Diagnostic Metrics: (examples)

- RL.2.1 % Orders Delivered in Full
- RL.2.4 Perfect Condition
- RL.3.19 % Orders Received Defect Free
- RL.3.24 % Orders Received Damage Free

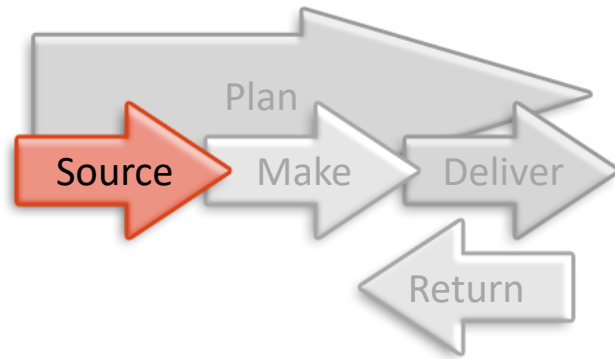
Notes: An order is perfect only if all L2/L3 metrics are perfect; An order must be: on-time AND in-full AND right condition AND right documentation

SCOR-Plan



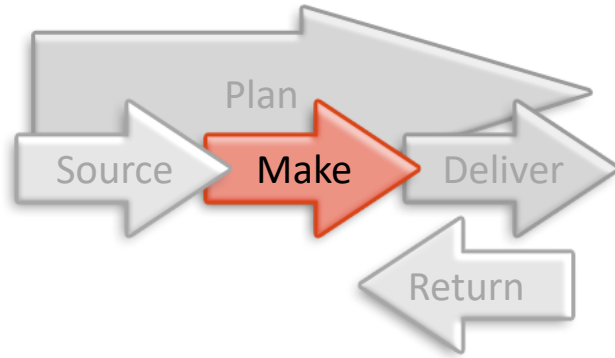
sP PLAN				
sP1 Plan Supply Chain	sP2 Plan Source	sP3 Plan Make	sP4 Plan Deliver	sP5 Plan Return
sP1.1: Identify, Prioritize, and Aggregate Supply Chain Requirements sP1.2: Identify, Prioritize, and Aggregate Supply Chain Resources sP1.3: Balance Supply Chain Resources with Supply Chain Requirements sP1.4: Establish and Communicate Supply Chain Plans	sP2.1: Identify, Prioritize, and Aggregate Product Requirements sP2.2: Identify, Assess, and Aggregate Product Resources sP2.3: Balance Product Resources with Product Requirements sP2.4: Establish Sourcing Plans	sP3.1: Identify, Prioritize, and Aggregate Production Requirements sP3.2: Identify, Assess, and Aggregate Production Resources sP3.3: Balance Production Resources with Production Requirements sP3.4: Establish Production Plans	sP4.1: Identify, Prioritize, and Aggregate Delivery Requirements sP4.2: Identify, Assess, and Aggregate Delivery Resources sP4.3: Balance Delivery Resources with Delivery Requirements sP4.4: Establish Delivery Plans	sP5.1: Identify, Prioritize, and Aggregate Return Requirements sP5.2: Identify, Assess, and Aggregate Return Resources sP5.3: Balance Return Resources with Return Requirements sP5.4: Establish and Communicate Return Plans

SCOR-Source



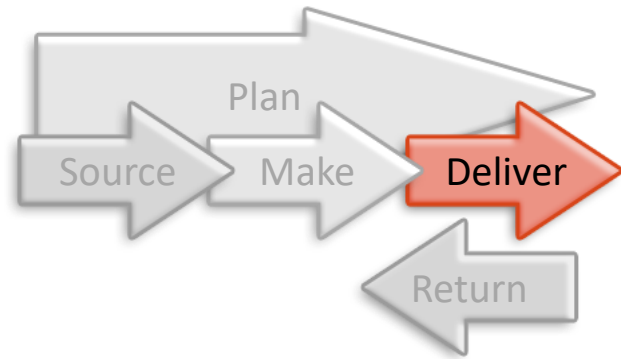
sS SOURCE		
sS1 Source Stocked Product	sS2 Source Make-to-Order Product	sS3 Source Engineer-to- Order Product
sS1.1: Schedule Product Deliveries	sS2.1: Schedule Product Deliveries	sS3.1: Identify Sources of Supply
sS1.2: Receive Product	sS2.2: Receive Product	sS3.2: Select Final Supplier(s) and Negotiate
sS1.3: Verify Product	sS2.3: Verify Product	sS3.3: Schedule Product Deliveries
sS1.4: Transfer Product	sS2.4: Transfer Product	sS3.4: Receive Product
sS1.5: Authorize Supplier Payment	sS2.5: Authorize Supplier Payment	sS3.5: Verify Product
		sS3.6: Transfer Product
		sS3.7: Authorize Supplier Payment

SCOR-Make



sM MAKE		
sM1 Make-to-Stock	sM2 Make-to-Order	sM3 Engineer-to-Order
sM1.1: Schedule Production Activities	sM2.1: Schedule Production Activities	sM3.1: Finalize Production Engineering
sM1.2: Issue Product	sM2.2: Issue Product	sM3.2: Schedule Production Activities
sM1.3: Produce and Test	sM2.3: Produce and Test	sM3.3: Issue Product
sM1.4: Package	sM2.4: Package	sM3.4: Produce and Test
sM1.5: Stage Product	sM2.5: Stage Finished Product	sM3.5: Package
sM1.6: Release Product to Deliver	sM2.6: Release Finished Product to Deliver	sM3.6: Stage Finished Product
sM1.7: Waste Disposal	sM2.7: Waste Disposal	sM3.7: Release Product to Deliver
		sM3.8: Waste Disposal

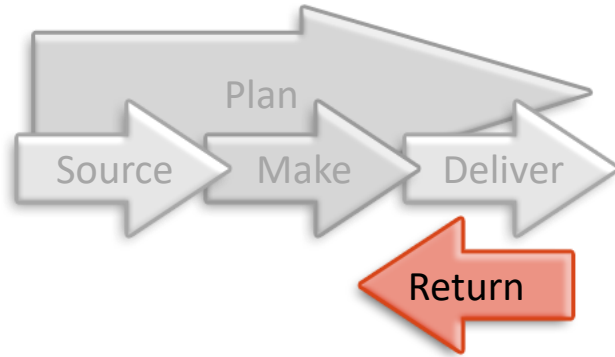
SCOR-Deliver



sD DELIVER

sD1 Deliver Stocked Product	sD2 Deliver Make-to-Order Product	sD3 Deliver Engineer-to- Order Product	sD4 Deliver Retail Product
sD1.1: Process Inquiry and Quote	sD2.1: Process Inquiry and Quote	sD3.1: Obtain and Respond to RFP/RFQ	sD4.1: Generate Stocking Schedule
sD1.2: Receive, Enter, and Validate Order	sD2.2: Receive, Configure, Enter, and Validate Order	sD3.2: Negotiate and Receive Contract	sD4.2: Receive Product at the Store
sD1.3: Reserve Inventory and Determine Delivery Date	sD2.3: Reserve Inventory and Determine Delivery Date	sD3.3: Enter Order, Commit Resources, and Launch Program	sD4.3: Pick Product from Backroom
sD1.4: Consolidate Orders	sD2.4: Consolidate Orders	sD3.4: Schedule Installation	sD4.4: Stock Shelf
sD1.5: Build Loads	sD2.5: Build Loads	sD3.5: Build Loads	sD4.5: Fill Shopping Cart
sD1.6: Route Shipments	sD2.6: Route Shipments	sD3.6: Route Shipments	sD4.6: Checkout
sD1.7: Select Carriers and Rate Shipments	sD2.7: Select Carriers and Rate Shipments	sD3.7: Select Carriers and Rate Shipments	sD4.7: Deliver and/or Install
sD1.8: Receive Product from Source or Make	sD2.8: Receive Product from Source or Make	sD3.8: Receive Product from Source or Make	
sD1.9: Pick Product	sD2.9: Pick Product	sD3.9: Pick Product	
sD1.10: Pack Product	sD2.10: Pack Product	sD3.10: Pack Product	
sD1.11: Load Vehicle and Generate Shipping Docs	sD2.11: Load Product and Generate Shipping Docs	sD3.11: Load Product and Generate Shipping Docs	
sD1.12: Ship Product	sD2.12: Ship Product	sD3.12: Ship Product	
sD1.13: Receive and Verify Product by Customer	sD2.13: Receive and Verify Product by Customer	sD3.13: Receive and Verify Product by Customer	
sD1.14: Install Product	sD2.14: Install Product	sD3.14: Install Product	
sD1.15: Invoice	sD2.15: Invoice	sD3.15: Invoice	

SCOR-Return



sSR RETURN

sSR1 Source Return Defective Product	sSR2 Source Return MRO Product	sSR3 Source Return Excess Product
<p>sSR1.1: Identify Defective Product Condition</p> <p>sSR1.2: Disposition Defective Product</p> <p>sSR1.3: Request Defective Product Return Authorization</p> <p>sSR1.4: Schedule Defective Product Shipment</p> <p>sSR1.5: Return Defective Product</p>	<p>sSR2.1: Identify MRO Product Condition</p> <p>sSR2.2: Disposition MRO Product</p> <p>sSR2.3: Request MRO Return Authorization</p> <p>sSR2.4: Schedule MRO Shipment</p> <p>sSR2.5: Return MRO Product</p>	<p>sSR3.1: Identify Excess Product Condition</p> <p>sSR3.2: Disposition Excess Product</p> <p>sSR3.3: Request Excess Product Return Authorization</p> <p>sSR3.4: Schedule Excess Product Shipment</p> <p>sSR3.5: Return Excess Product</p>
sDR1 Deliver Return Defective Product	sDR2 Deliver Return MRO Product	sDR3 Deliver Return Excess Product
<p>sDR1.1: Authorize Defective Product Return</p> <p>sDR1.2: Schedule Defective Return Receipt</p> <p>sDR1.3: Receive Defective Product (Includes Verify)</p> <p>sDR1.4: Transfer Defective Product</p>	<p>sDR2.1: Authorize MRO Product Return</p> <p>sDR2.2: Schedule MRO Return Receipt</p> <p>sDR2.3: Receive MRO Product</p> <p>sDR2.4: Transfer MRO Product</p>	<p>sDR3.1: Authorize Excess Product Return</p> <p>sDR3.2: Schedule Excess Return Receipt</p> <p>sDR3.3: Receive Excess Product</p> <p>sDR3.4: Transfer Excess Product</p>

GSCF model

Supply chain management process	Description
1. Customer relationship management	Provides the structure of how relationships with customers are developed and maintained
2. Customer service management	Provides the firm's face to customers, a single source of customer information
3. Demand management	Balance the customers' requirements with supply chain capabilities, forecasting and synchronizing
4. Order fulfillment	Includes all activities necessary to define customer requirements, design a network, integrates firm's functions to meet customer requests while minimizing the total delivered cost
5. Manufacturing flow management	Deals with making the product and establishing manufacturing flexibility
6. Supplier relationship management	Provides the structure for how relationships with suppliers are developed and maintained
7. Product development and commercialization	Provides the structure for developing new products and getting them to the market jointly with customers and suppliers
8. Returns management	Manages all activities related to returns, reverse logistics, gatekeeping and avoidance

(Adopted from Lambert et al. 2005)