Using SCOR as a Supply Chain Management Framework for Government Agency Contract Requirements

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The Problem

- **Lack of ownership/accountability/need-recognition/understanding of supply chain management**

- **Increasing operational and sustainment costs**
  - **Sacrifice long-term savings for short-term gains**

- **Pressure from Government Accountability Office**

- **Lack of enterprise supply chain perspective**

Importance of Supply Chain Management

> "The integration of NASA centers, facilities, third party enterprises, orbital entities, space locations, and space carriers that network/partner together to plan, execute, and enable an Exploration mission that will deliver an Exploration product (crew, supplies, data, information, knowledge, and physical samples) and to provide the after delivery support, services, and returns that may be requested by the customer."
>
> *- Michael Galluzzi, Constellation Supply Chain Manager*
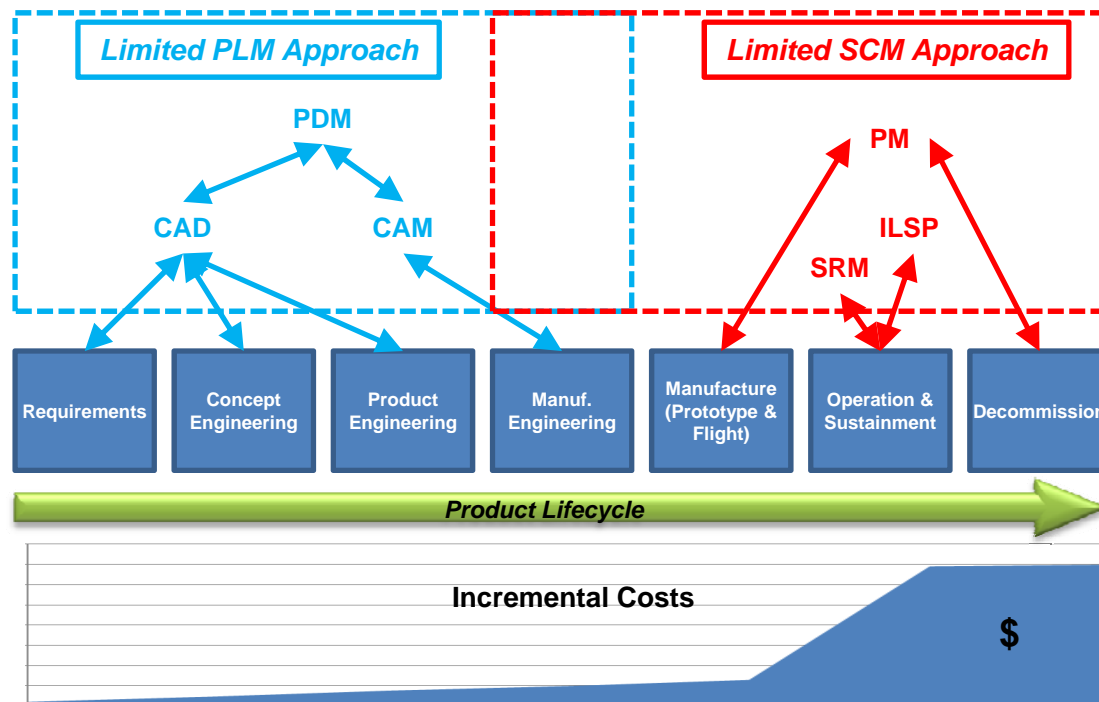
- ➢ **Many processes and functions require access to many sources of data across and up/down the supply chain**

- ➢ **Operations and sustainment costs are driven by decisions made early in the Product Lifecycle**

- ➢ **SCM thinking is minimal early in the Product Lifecycle**

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Enterprise Supply Chain Management

- Specifying suppliers to support inter-program and inter-agency efforts
- Optimizing inventory levels and locations throughout the supply chain
- Executing corrective actions to improve quality and lead time issues throughout the supply chain
- Processing reported data to calculate and make visible supply chain performance (provide information for decisions and actions)
- Ensuring the right hardware and information is provided at the right time and in the right place
- Monitoring the industrial base while developing, producing, operating and retiring a system
- Seeing performance deep in the supply chain that could indicate issues affecting system availability and readiness

How can all this be structured and managed?

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SCOR Model

Framework for describing a supply chain with process building blocks and business activities.

Source: Supply-Chain Council

Processes

Metrics

Best Practices
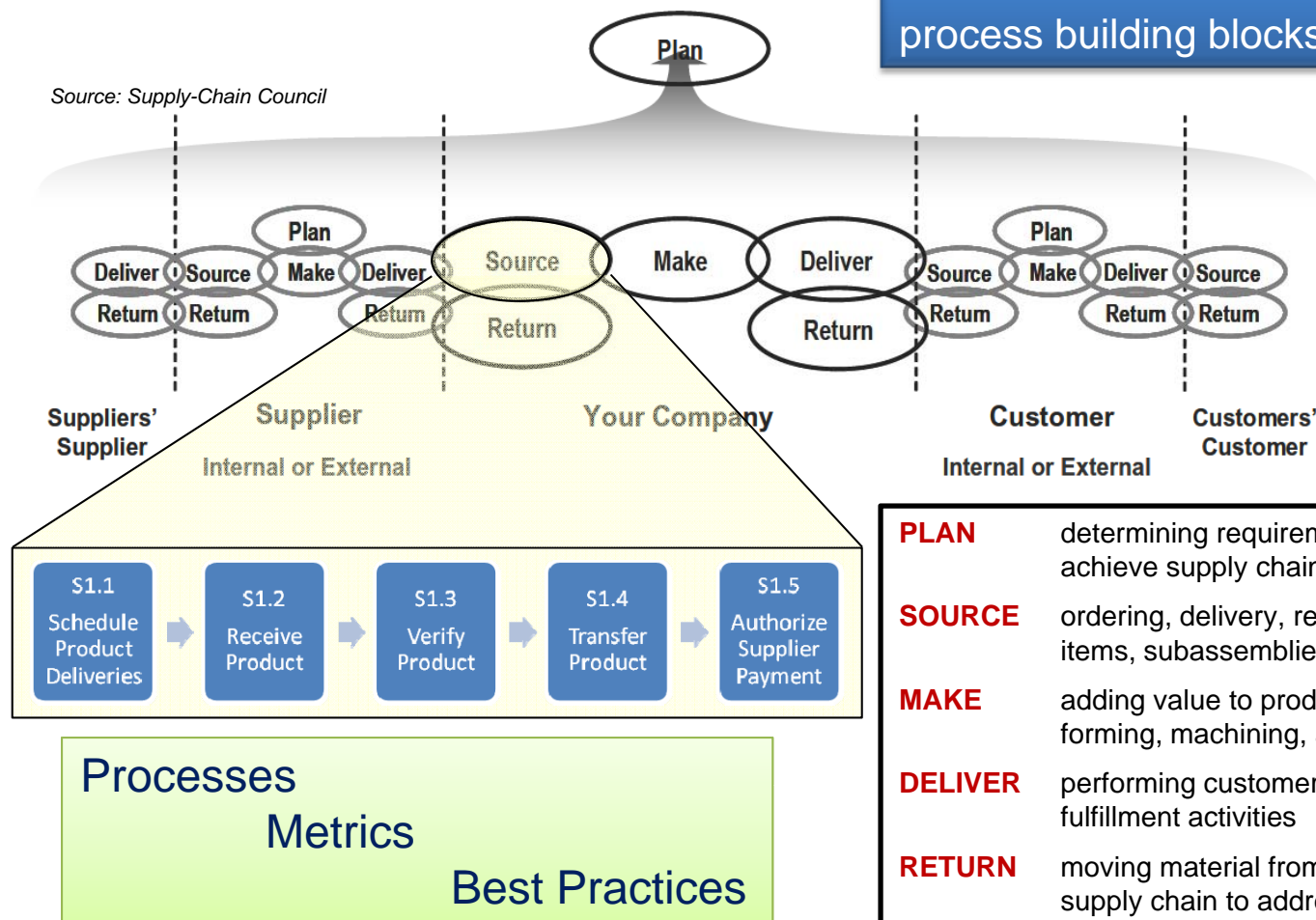
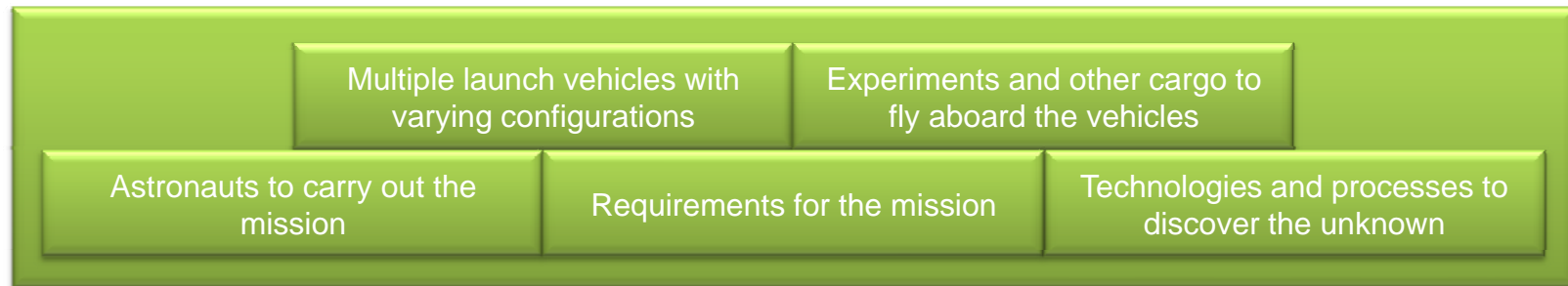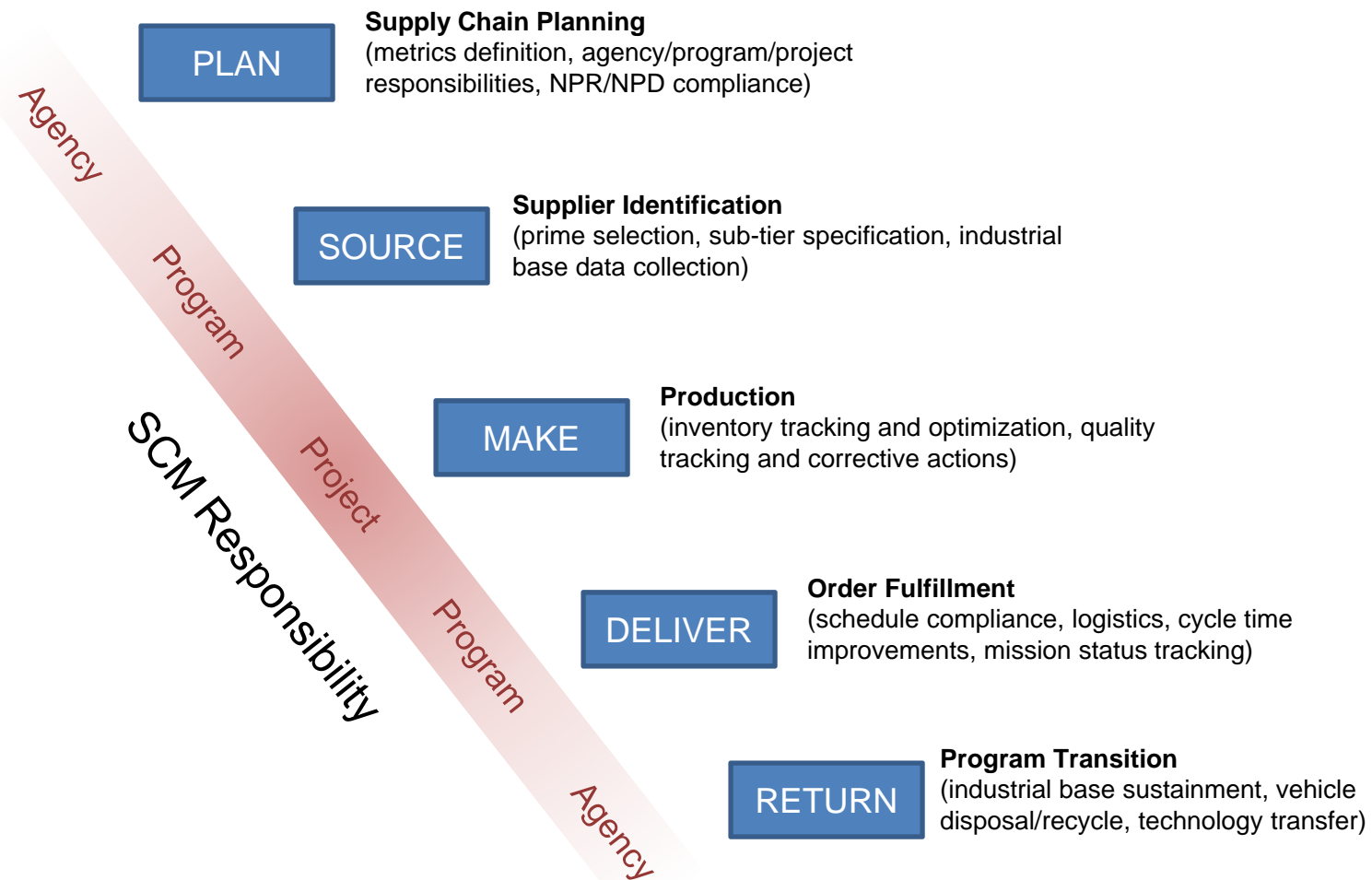|	
PLAN	determining requirements and corrective actions to achieve supply chain objectives
SOURCE	ordering, delivery, receipt and transfer of raw material items, subassemblies, product and/or services
MAKE	adding value to products through mixing, separating, forming, machining, and chemical processes
DELIVER	performing customer-facing order management and order fulfillment activities
RETURN	moving material from the customer back through the supply chain to address defects in product, ordering, or manufacturing, or to perform upkeep activities

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Mission Perspective of the Supply Chain

Multiple launch vehicles with varying configurations	Experiments and other cargo to fly aboard the vehicles

Astronauts to carry out the mission	Requirements for the mission	Technologies and processes to discover the unknown

- **Will the program last through the planned lifecycle?**
  - **Will parts continue to be available?**
  - **Will expertise be available if parts fail (identify reason and re-design or re-mfg, etc.)?**
  - **Will expertise be there if mission changes and performance requirements change (on moon longer, land on asteroid vs. moon, unknowns from lessons learned during missions)?**

- **Can inventory throughout the supply chain be optimized to save overall (not just at a single level)?**

- **Are NASA expectations of primes relegated through the supply chain? Are upstream levels of the supply chain exercising supply chain management best practices?**

- **Is the supply chain advancing in maturity with progression through the product?**

- **Will mission schedule and budget be sustained through the operation phase of the lifecycle? Will the industrial base continue to meet the mission requirements?**

Supply Chain Management Responsibility

PLAN

Supply Chain Planning
(metrics definition, agency/program/project responsibilities, NPR/NPD compliance)

SOURCE

Supplier Identification
(prime selection, sub-tier specification, industrial base data collection)

MAKE

Production
(inventory tracking and optimization, quality tracking and corrective actions)

DELIVER

Order Fulfillment
(schedule compliance, logistics, cycle time improvements, mission status tracking)

RETURN

Program Transition
(industrial base sustainment, vehicle disposal/recycle, technology transfer)

Agency
Program
Project
Program
Agency

SCM Responsibility

SCM Metrics

STRATEGIC				OPERATIONAL
% Increase in Inter-Agency Supplier Capability	Forecast Accuracy	Overall Perfect Order Fulfillment	Total Time to Manufacture	
Upstream Supply Chain Flexibility	Inter-Agency Supply Chain Mfg Capacity Utilization	Delivery Cycle Time	Source Selection Cycle Time	

NASA SCM

Agency

Program

Project

Information Flow

Source Specifications

Lead Times
Inventory Levels
1st Time Quality

CAR to improve
Cycle Time
Schedule
Updates

Supplier Info (who/what, financial, technology) Obsolescence Risk

Optimized Inventory Levels CAR to Improve Quality

Perfect Order Fulfillment

Mission Status

Supply Chain Lifecycle

PLAN	SOURCE	MAKE	DELIVER	RETURN

Supply Chain

SUPPLIER PYRAMID

Company Info by Tier

INVENTORY PYRAMID

Inventory and Quality Info by Tier

DELIVERY PYRAMID

Delivery Performance by Tier

MISSION PYRAMID

Certificate Info (FRR, COFR, etc.)

Contract Implications and Summary

- **Adapted SCOR model**
  - **Identifies…**
    - **What information is needed**
    - **When in the product/mission lifecycle it is needed**
    - **From where it could come**

    Potential contract requirements

  - **Highlights…**
    - **Need for project, program and agency involvement in supply chain management, as well as supply chain entities themselves**

    Potential agency policies

  - **Utilizes…**
    - **Standard building blocks, metrics and best practices of the original SCOR model**