

ASCM
Supply Chain Operations Reference
Model
SCOR Digital
Standard

Visit scor.ascm.org for more information regarding the SCOR framework. The SCOR Digital Standard is available to all ASCM members on the ASCM website at ascm.org.

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Introduction

Introduction to SCOR

The Supply Chain Operations Reference Digital Standard (SCOR DS) is a model that provides methodology, diagnostic and benchmarking tools that help organizations make dramatic and rapid improvements in supply chain processes. The world of supply chain management never stops advancing, and neither do supply chain professionals and their organizations. Supply chains require savvy operators, supervisors, and leaders with knowledge about the global standards and practices that move the needle on supply chain performance. ASCM is the global leader in supply chain organizational transformation, innovation and leadership that develops supply chain talent and elevates end-to-end supply chain performance. From education and certification to benchmarking and best practices, ASCM sets the industry standard.

The SCOR Digital Standard is a part of the ASCM body of knowledge used to foster the advancement of end-to-end supply chain management.

SCOR Digital Standard Summary

The Supply Chain Operations Reference Digital Standard (SCOR DS) model is the product of ASCM (formerly APICS) following the merger of the Supply Chain Council and APICS in 2014. The SCOR model was established in 1996 and has been updated regularly to adapt to changes in supply chain business practices. SCOR remains a powerful tool for evaluating and comparing supply chain activities and performance. SCOR captures a consensus view of supply chain management. It provides a unique framework that links business processes, 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.

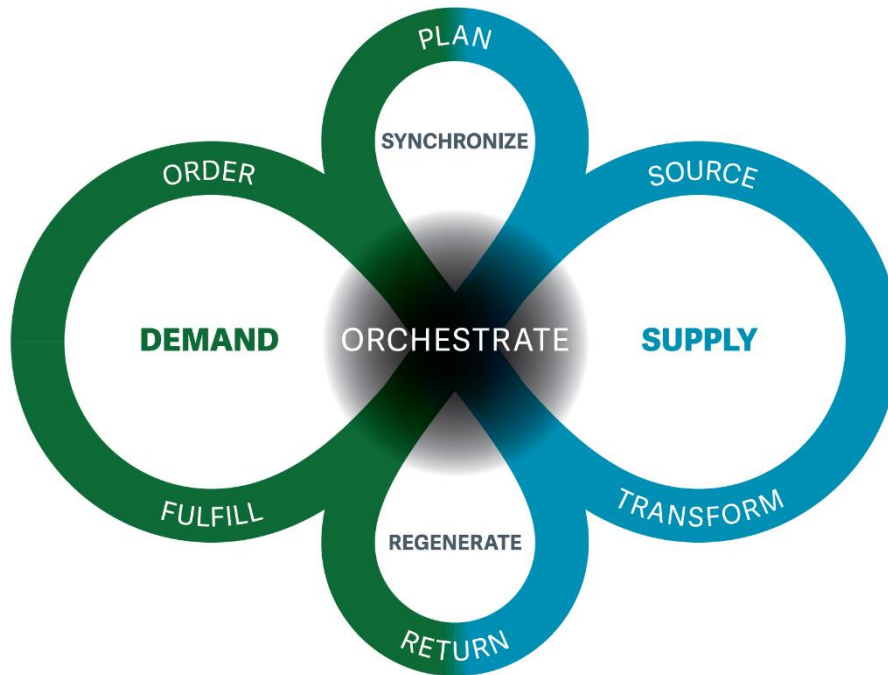
The ASCM member base represents a broad cross-section of industries, including manufacturers, distributors, and retailers. The vast ASCM network also is composed of technology suppliers and implementers, academics and government organizations that participate in ASCM activities and the development and maintenance of the SCOR Digital Standard model.

ASCM is interested in providing the widest possible dissemination of SCOR because the widespread use of the model enables communication using common definitions and measurements. It also results in better customer-supplier relationships, software systems that better support members using common measurements and terms, and the ability to rapidly adopt common practices.

Scope of the SCOR Digital Standard

The SCOR model has been developed to describe the business activities associated with all phases of satisfying customer demand. The model itself contains multiple tabbed sections and is organized around the seven primary management processes of Orchestrate, Plan, Order, Source, Transform, Fulfill, and Return. (See Graphic 1.) By using these process building blocks, the model can describe supply chains that are very simple or very complex using a common set of definitions. As a result, disparate industries can be linked to describe the depth and breadth of nearly any supply chain. The model has been able to successfully describe and provide a basis for supply chain improvement for global projects as well as site-specific projects.

SCOR Process



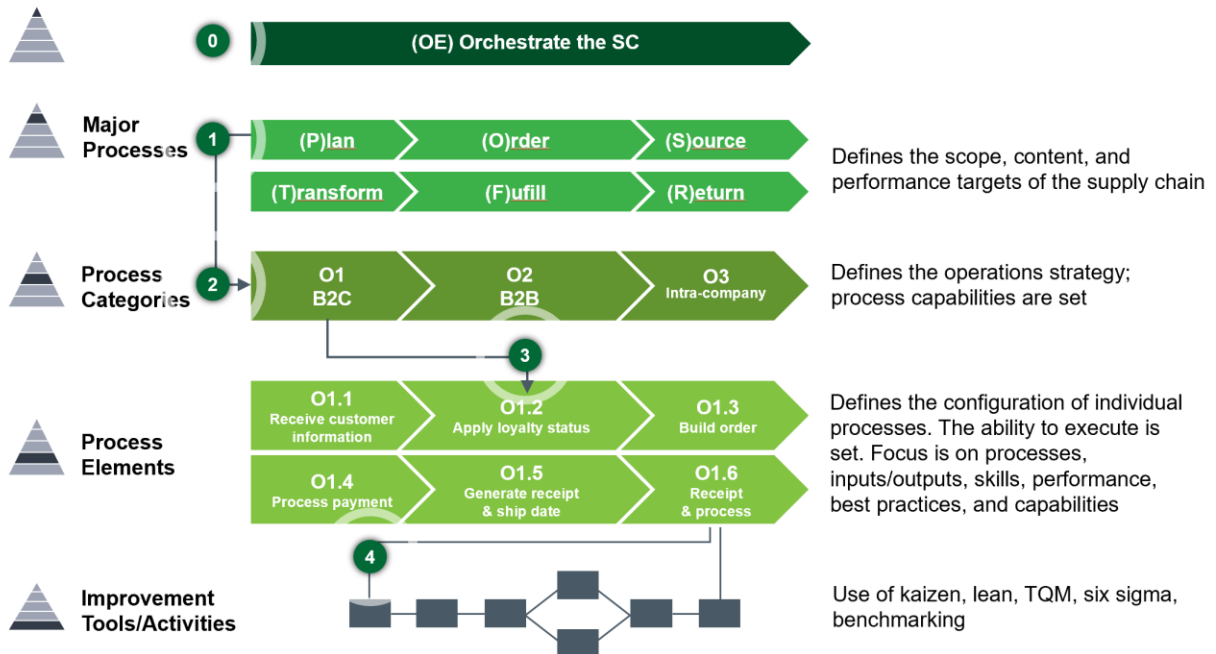
Graphic 1: SCOR-DS is organized around seven major management processes.

The graphic illustrating the SCOR-DS model is a double infinity diagram, representing today's supply chain's looped, continuous, and connected nature and the seven critical processes within every supply chain. The SCOR-DS graphic displays the balance of **Supply** and **Demand** in a horizontal infinity loop and **Synchronize** and **Regenerate** in a vertical infinity loop.

SCOR spans all customer interactions from order entry through paid invoice; all physical material transactions that occur from the supplier's supplier to the customer's customer, including transactions for equipment, supplies, spare parts, bulk products, and software; and all market interactions from the understanding of aggregate demand to the fulfillment of each order. It does not attempt to describe every business process or activity. Specifically, SCOR does not address sales and marketing, including demand generation; product development; or research and development

As shown in Graphic 2, the model is designed to support supply chain analysis at multiple levels. ASCM has focused on process levels 0 to 3, which are industry neutral. SCOR does not attempt to prescribe how an organization should conduct its business or tailor its systems and information flow. Every organization that implements supply chain improvements using SCOR will need to extend the model, at least to level 4, using industry, organization, and location-specific processes, systems, and practices.

SCOR Process Hierarchy



Graphic 2: SCOR is a hierarchical process model.

It is important to note that this model describes processes, not functions. In other words, the model focuses on the activity involved, not the person or organizational element that performs the activity.

SCOR structure

SCOR is a process reference model. The purpose of a process reference model, or business process framework, is to define process architecture in a way that aligns with key business functions and goals. Architecture here references how processes interact and perform, how these processes are configured, and the skills requirements for the staff operating the processes.

The SCOR reference model consists of four major sections:

- **Performance** includes standard metrics to describe process performance and define strategic goals.
- **Processes** offers standard descriptions of management processes and process relationships.
- **Practices** explains management practices that produce significantly better process performance.
- **People** comprises standard definitions for skills required to perform supply chain processes.

The SCOR model also contains a section called Resources, which provides two downloadable PDFs - *Introduction to SCOR* and *Information Model-SCOR Digital Standard*.

Performance

The Performance section of SCOR focuses on the measurement and assessment of the outcomes of supply chain process execution. A comprehensive approach to understanding, evaluating, and diagnosing supply chain performance consists of three elements: performance attributes, metrics, and process or practice maturity. These elements, as distinct from the levels in the Process and metrics hierarchies, describe different aspects or dimensions of performance:

- Performance attributes are strategic characteristics of supply chain performance used to prioritize and align the supply chain’s performance with the business strategy.
- Metrics are discrete performance measures that are composed of levels of a connected hierarchy.
- Process or practice maturity is a reference tool based on objective, specific descriptions that can be used to evaluate how well supply chain processes and practices incorporate and execute accepted best-practice process models and leading practices.
- SCOR recognizes three performance categories and eight performance attributes as shown in Table 1.

	Performance Attributes	Definition
Resilience	Reliability (RL)	The ability to perform tasks as expected. Reliability focuses on the predictability of the outcome of a process. Typical metrics for the Reliability attribute include delivering a product on time, in the right quantity, and at the right quality level.
	Responsiveness (RS)	The speed at which tasks are performed and the speed at which a supply chain provides products to the customer. Examples include cycle-time metrics.
	Agility (AG)	The ability to respond to external influences and marketplace changes to gain or maintain a competitive advantage.
Economic	Costs (CO)	The cost of operating the supply chain processes. This includes labor costs, material costs, and management and transportation costs.
	Profit (PR)	The Profit attribute describes the financial benefit realized when the revenue generated from a business activity exceeds the expenses, costs, and taxes involved in sustaining the activity.
	Assets (AM)	The ability to efficiently utilize assets. Assets’ strategies in a supply chain include inventory reduction and insourcing rather than outsourcing.
Sustainability	Environmental (EV)	The Environmental attribute describes the ability to operate the supply chain with minimal environmental impact, including materials, water, and energy.
	Social (SC)	The Social attribute describes the ability to operate the supply chain aligned with the organization’s social values, including diversity and inclusion, wage, and training metrics.

Table 1: The SCOR performance attributes

Reliability, Responsiveness and Agility are considered customer (resilience) focused. Cost, Profit, and Assets are considered internally (economically) focused. Environmental and Social are outward (sustainability) focused. All SCOR metrics are grouped within one of the performance attributes.

Each Performance attribute has at least one level-1 or strategic metric. These level-1 metrics are the calculations by which an organization can measure how successful it is in achieving its desired positioning within the competitive marketplace.

	Performance Attributes	Definition
Economic	Reliability (RL)	Perfect Order Fulfillment (RL.1.1) Perfect Supplier Order (RL.1.2) Perfect Return Order Fulfillment (RL.1.3)
	Responsiveness (RS)	Order Fulfillment Cycle Time (RS.1.1)
	Agility (AG)	Supply Chain Agility (AG.1.1)
Economic	Costs (CO)	Total Supply Chain Management Costs (CO.1.1) Cost of Goods Sold (COGS) (CO.1.2)
	Profit (PR)	Earnings Before Interest and Taxes (EBIT) as a Percent of Revenue (PR.1.1) Effective Tax Rate (PR.1.2)
	Assets (AM)	Cash-to-Cash Cycle Time (AM.1.1) Return on Fixed Assts (AM.1.2) Return on Working Capital (AM.1.3)
Sustainability	Environmental (EV)	Materials Used (EV.1.1) Energy Consumed (EV.1.2) Water Consumed (EV.1.3) GHG Emissions (EV.1.4) Waste Generation (EV.1.5)
	Social (SC)	Diversity and Inclusion (SC.1.1) Wage Level (SC.1.2) Training (SC.1.3)

Table 2: The SCOR level 1 metrics

The SCOR metrics are organized in a hierarchical structure. SCOR describes level-1, level-2, and level-3 metrics. The relationships between these levels are diagnostic. Level-2 metrics serve as diagnostics for level-1 metrics. This means that by looking at the performances of the level-2 metrics, performance gaps or improvements for level-1 metrics can be explained. This type of analysis of the performance of a supply chain is referred to as metric decomposition or

root-causing. Similarly, level-3 metrics serve as diagnostics for level-2 metrics. The level of a metric is included in the codification of the metric itself.

Metrics codification starts with the performance attributes: Reliability is RL, Responsiveness is RS, Agility is AG, Profit is PR, Cost is CO, Assets is AM (for Assets Management), Environmental is EV, and Social is SC. Each metric starts with a two-letter code, followed by a number to indicate the level and then a unique numerical identifier. For example, Perfect Customer Order Fulfillment (RL.1.1) is a level-1 metric within the Reliability attribute. Customer Order Perfect Condition (RL.2.4) is a level-2 Reliability metric.

Process or practice maturity provides a qualitative comparison of supply chain processes and practices to descriptive representations of different levels of process and practice adoption and implementation. This evaluation measurement of supply chain process and practice effectiveness typically follows widely used models for practice maturity, which sometimes are referred to as capability maturity models. Numerous maturity models exist for supply chain management, and they typically follow a stages of maturity scale. On these types of scales, high-maturity processes employ, and often extend, best practices and are implemented with a high degree of discipline and compliance. By comparison, low-maturity processes are characterized by outdated practices or a lack of discipline and consistency. SCOR currently does not embed a prescribed maturity model framework and content directly into the SCOR model document. The Performance section provides an overview of this important element of supply chain performance, and SCOR users are encouraged to draw upon existing maturity models to develop and tailor the content to their industries and companies.

Processes

The Processes section of SCOR provides a set of predefined descriptions for activities most companies perform to effectively execute their supply chains. The macro-level SCOR processes, include Level-0 and Level-1 processes. Orchestrate is a Level-0 process; Plan, Order, Source, Transform, Fulfill and Return are Level-1 processes and are well-known and widely adopted. SCOR also identifies two more process levels. In this section, level indicates the span of the process. A level-3 process is focused on a more detailed activity. A level-1 process spans multiple level-3 processes. Graphic 2 shows the levels within the SCOR model processes.

Level-2 process categories determine the capabilities within the level-1 processes. For example, the key level-2 processes for Plan are Plan Supply Chain, Plan Order, Plan Source, Plan Transform, Plan Fulfill, and Plan Return; the level-2 processes for Source are Strategic Source, Direct Procure, Indirect Procure, and Source Return. Level-3 processes are process steps that are performed in a certain sequence to plan supply chain activities, source materials, make products, deliver goods and services, and handle product returns.

Companies may develop standard process descriptions for activities within the level-3 processes, which would become level-4 processes. These processes generally are industry-, product-, location- or technology-specific. For example, most if not all companies need to perform a task known as receive order signal. This is a level-3 process (F1.1, F2.1 & F3.1, for example). The level-4 processes would describe the steps to receive the order signal, such as whether the order was received electronically, over the phone or in person. Each of these scenarios may require a unique level-4 process description. Another step could be how the order is entered and processed. For example, electronic orders may be automatically processed by software, phone orders might be handled by the order desk, and in-person orders would be handled at the checkout counter.

The level at which processes need to be described depends on the project. For most projects, level-2 process diagrams help identify structural issues in the supply chain, such as why a company has a warehouse feeding a warehouse feeding a warehouse or why lead times for certain sources are longer.

Level-3 process diagrams help identify decision points, triggers and process disconnects. For example, consignment inventory and another sourcing alternative, vendor-managed inventory, are listed as Practices. Both need the standard level-3 processes, but the way these processes are sequenced and who performs them is the differentiator.

Process codification differs by level. Level-0 and Level-1 processes are represented by one or two capitals. OE are the initials for Orchestrate, P represents Plan, S identifies Source, O designates Order, T labels Transform, F denotes Fulfill, and R marks Return. Most level-2 processes add a period and a number, such as in F.1 for Fulfill B2C and P.3 for Plan Source. Level-3 processes add a period followed by a unique number, such as in F1.1 for Receive Order Signal and F1.2 for Pick product.

Practices

The practices section provides a collection of industry-neutral practices that companies have recognized for their value. A practice is a unique way to configure a process or a set of processes. The uniqueness can be related to the automation of the process, a technology applied in the process, special skills applied to the process, a unique sequence for performing the process, or a unique method for distributing and connecting processes between organizations.

SCOR recognizes that several different qualifications of practices exist within any organization and however, this version classifies all practices as Best Practices (BP). SCOR also recognizes the qualification of a practice may vary by industry or geography. For some industries, a practice may be standard, whereas the same practice may be considered an emerging or best practice in another industry. The SCOR classification of practices has been established based on input from practitioners and experts from a diverse range of industries.

All SCOR practices have been mapped to one or more classifications. SCOR recognizes twenty-one classifications, which help identify practices by focus area, such as inventory management or new product introduction.

Practices also are mapped to one or more practice pillars, namely Analytics and Technology, Process, and Organization. The pillars help identify where a given practice has the most impact and can provide maximum benefit.

People

The People section of SCOR was introduced in SCOR v10 and provides a standard for describing skills required to perform tasks and manage processes. Typically, these skills are specific to supply chain management, but some skills may be applicable outside the supply chain process domain as well.

Skills are described by a standard definition and association to other People aspects, namely experiences, training, and competency levels. Competency levels are not included in the framework descriptions, but SCOR recognizes five commonly accepted competency levels:

- A novice is an untrained beginner with no experience who requires and follows detailed documentation.
- A beginner performs the work with limited situational perception.
- A competent employee understands the work and can determine priorities to reach goals.
- A proficient individual oversees all aspects of the work and can prioritize based on situational aspects.
- An expert has intuitive understanding and can apply experience patterns to new situations.

These competency levels are used similarly as process or practice maturity levels. The person or job specification is evaluated on the found, in the case of a person, or desired, in the case of a job specification, level of competency.

Codification within the People section represents skills, experiences, and training. All People elements start with a capital H followed by a capital letter representing the element: S is for skills, E is for experiences, and T is for training. These are followed by a period and a four-digit number. For example, HS.0046 is the code for the skill Enterprise Resources Planning (ERP) Systems, and HT.0007 is the code for APICS Certified Supply Chain Professional (CSCP) training.

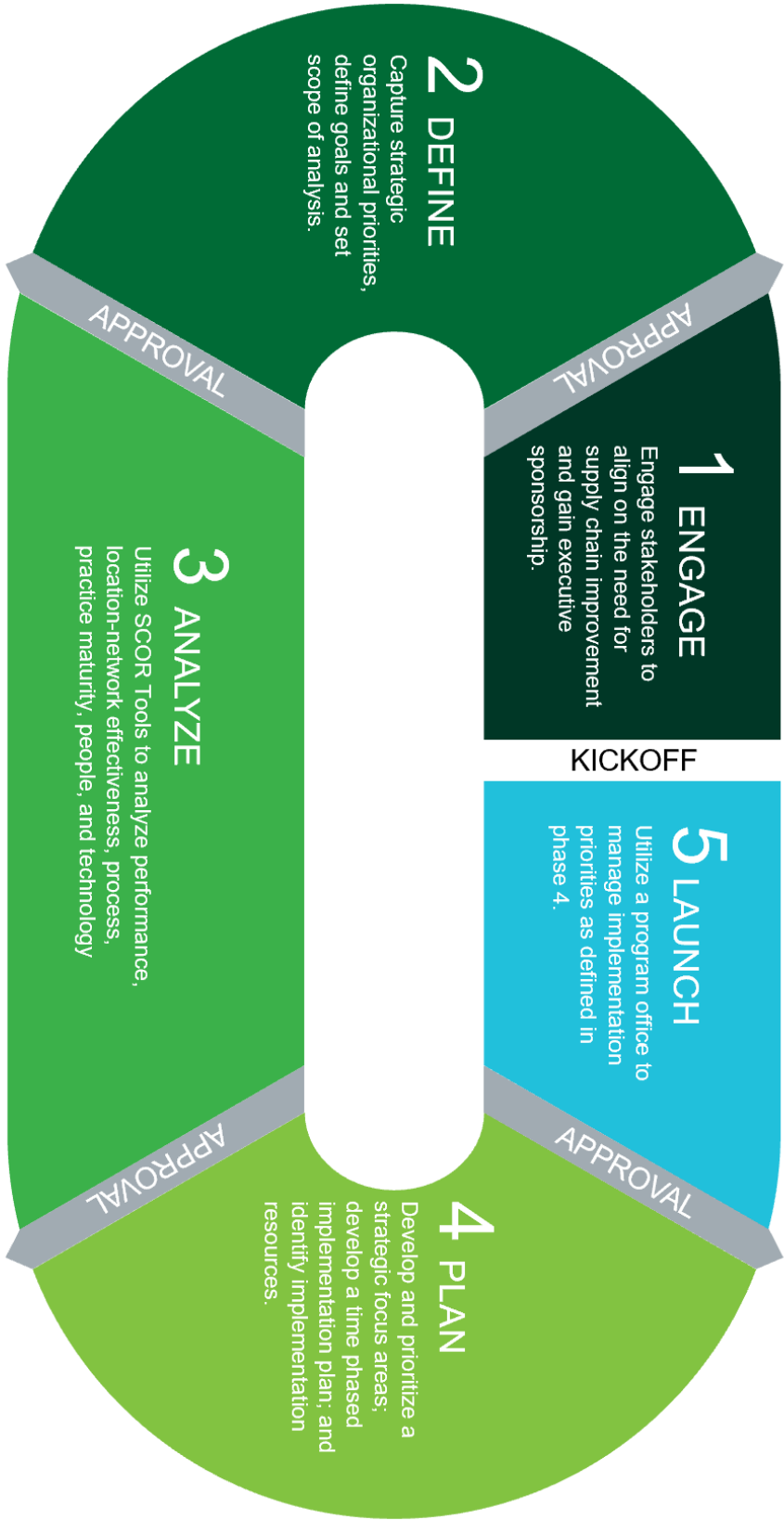
SCOR improvement program and SCOR Racetrack

The SCOR Racetrack model describes how to organize a SCOR improvement program using the SCOR process and supporting methodologies

The methodology is described in five distinct steps:

- Pre-SCOR program steps: Prepare the organization for the mission critical SCOR improvement program.
- Set the scope: Understand the business environment and define the scope of the supply chain for a SCOR improvement program.
- Configure the supply chain: Determine the performance metrics and processes of the SCOR improvement program.
- Optimize projects: Establish the project portfolio including process scope, priority, and anticipated benefits.
- Ready for implementation: Implement projects in the portfolio and commence benefits realization.

See Graphic 3 and Graphic 4 on the next two page to view the SCOR Racetrack model in detail. The SCOR improvement methodology currently is described in full in the SCOR-Professional training material.



Graphic 3: SCOR Racetrack model



Graphic 4: SCOR Racetrack model activities

SCOR v14 Updates

The SCOR model is developed and maintained by the voluntary efforts of ASCM members and supply chain industry subject matter experts. ASCM depends on the contributions of its members to actively advance the state of knowledge in supply chain by identifying required model changes, researching, and validating those changes, and developing the consensus regarding the proposed changes.

The following updates were included in this revision of the SCOR framework.

- No longer linear – outside in, infinitely in motion
- Added Orchestrate to ‘multi-directionally’ link supply chain strategy to Plan and the rest of the processes
- Overhauled Source
- Formalized Warehouse and Transportation Planning
- Separated Deliver into Order and Fulfill to better represent omni-channel, transportation, and warehouse management
- Expanded Make to Transform and updated Return to include services
- Expanded SCOR attributes: customer facing to **Resilience**; internal facing to **Economic**; and added **Sustainability**
- Added sustainability (circularity) practices, metrics, skills, competencies to all processes
- Supply Chain subject matter experts reviewed all Performance, Process, Practices and People attributes. There are many additions, a few deletions (obsolete items) and all definitions reviewed and edited. Many changes in Level 2 and 3 for Performance and Processes.
- Open access with [authenticated ASCM login](#). There is no cost to register on ascm.org.

Technical Contributors to the SCOR Digital Standard

ASCM would like to extend our gratitude to the following subject matter experts for their technical contributions, time commitment, expertise, and passion to the continued development of the SCOR Digital Standard (DS). The development of SCOR depends on the support and input of SCOR practitioners, supply chain subject matter experts, and ASCM members. The following individuals have devoted time and effort to the development of the SCOR DS. We would also like to specially recognize the SCOR DS Facilitators for leading this update, as well as their task force volunteers who actively assisted throughout the SCOR DS 2022 update. Thank you!

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