



Supply Chain Operations Reference Model

Version 10.0

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The Supply Chain Council, Inc.
SCOR: The Supply Chain Reference
ISBN 0-615-20259-4 (binder)

Printed in the United States of America.

August 2010

Acknowledgments

The following members (alphabetical by company) of the Supply Chain Council technical development and project Teams devoted extensive time and/or effort to the development of revision 10.0 of SCOR.

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Thank you.

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Section 1

Introduction

Summary

The Supply-Chain Operations Reference model (SCOR®) is the product of the Supply-Chain Council (SCC) a global non-profit consortium whose methodology, diagnostic and benchmarking tools help organizations make dramatic and rapid improvements in supply-chain processes. SCC established the SCOR process reference model for evaluating and comparing supply-chain activities and performance. The SCOR-model captures the Council's consensus view of supply chain management. 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. SCC membership is open to all companies and organizations interested in applying and advancing the state-of-the-art in supply-chain management systems and practices.

The SCC was organized in 1996 and initially included 69 practitioner companies meeting in an informal consortium. Subsequently, the companies of the Council elected to form an independent not for profit trade association. The majority of the SCC's members are practitioners and represent a broad cross-section of industries, including manufacturers, distributors, and retailers. Equally important to the Council and the advancement of the SCOR-model are the technology suppliers and implementers, the academicians, and the government organizations that participate in Council activities and the development and maintenance of the Model. At the time of this release, the Council has approximately 800 corporate members worldwide and has established international chapters in Australia/New Zealand, Latin America, Greater China, Europe, Japan, Southeast Asia, and Southern Africa with additional requests for regional chapters pending.

The Supply-Chain Council is interested in providing the widest possible dissemination of the SCOR-model. The wide-spread use of the Model results in better customer-supplier relationships, software systems that can better support members through the use of common measurements and terms, and the ability to rapidly recognize and adopt best practice no matter where it originates. SCC requests that all who use the SCOR-model provide attribution to the Supply-Chain Council. Additionally, members are encouraged to monitor the members section of the SCC website (www.supply-chain.org) to ensure that they are using the latest version of SCOR.

This introduction is provided to assist new users of the SCOR-model to begin analytic and implementation projects. It is intended to remind experienced users of the framework and structure of the Model when tackling more complex applications of the Model for their businesses. Finally, it is provided to orient members to the changes between Version 9.0 and Version 10.0.

Version 10.0 of the SCOR-model is the twelfth revision since the Model's introduction in 1996. Revisions of the Model are made when it is determined by Council members that changes should be made to facilitate the use of the Model in practice. Specific changes in Version 10.0 are outlined later in this Introduction.

SCOR Scope

The SCOR-model has been developed to describe the business activities associated with all phases of satisfying a customer's demand. The Model itself contains several sections and is organized around the five primary management processes of Plan, Source, Make, Deliver, and Return (shown in **Figure 1**). By describing supply chains using these process building blocks, the Model can be used to 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 virtually 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.

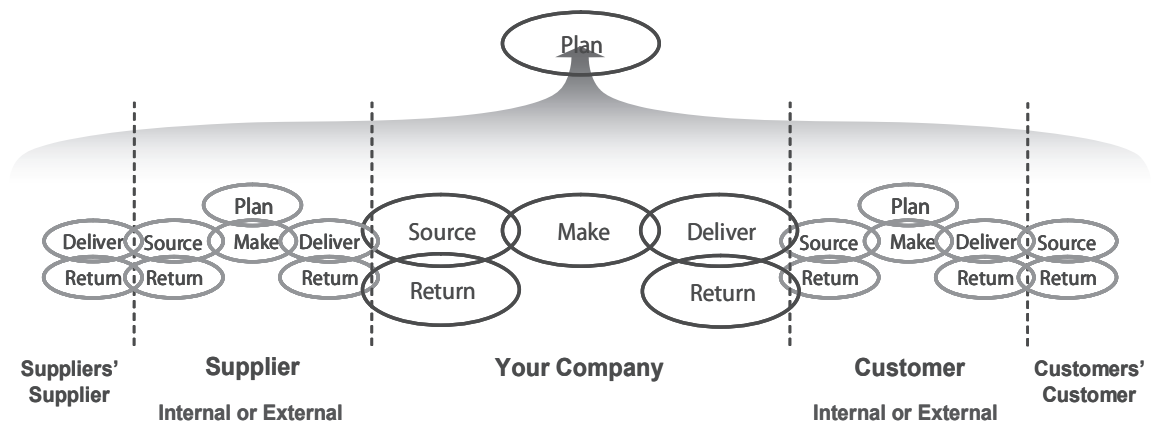


Figure 1 - SCOR is organized around five major management processes.

It spans: all customer interactions (order entry through paid invoice), all physical material transactions (supplier's supplier to customer's customer, including equipment, supplies, spare parts, bulk product, software, etc.) 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, the Model does not address: sales and marketing (demand generation), product development, research and development, and some elements of post-delivery customer support.

It should be noted that the scope of the Model has changed and is anticipated to change based on Council member requirements. With the introduction of Return, the Model was extended into the area of post-delivery customer support (although it does not include all activities in that area).

As shown in **Figure 2**, the Model is designed and maintained to support supply chains of various complexities and across multiple industries. The Council has focused on three process levels and does not attempt to prescribe how a particular organization should conduct its business or tailor its systems / information flow. Every organization that implements supply chain improvements using the SCOR-model will need to extend the Model, at least to Level 4, using organization-specific processes, systems, and practice.

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The Model is silent in the areas of human resources, training, and quality assurance. Currently, it is the position of the Council that these horizontal activities are implicit in the Model and there are other highly qualified organizations that are chiefly concerned with how an organization should train, retain, organize, and conduct their quality programs. Just as the Council recognized the requirements for marketing and sales in commercial organizations, the Council is not minimizing the importance of these activities, but they are currently out of scope for SCOR.

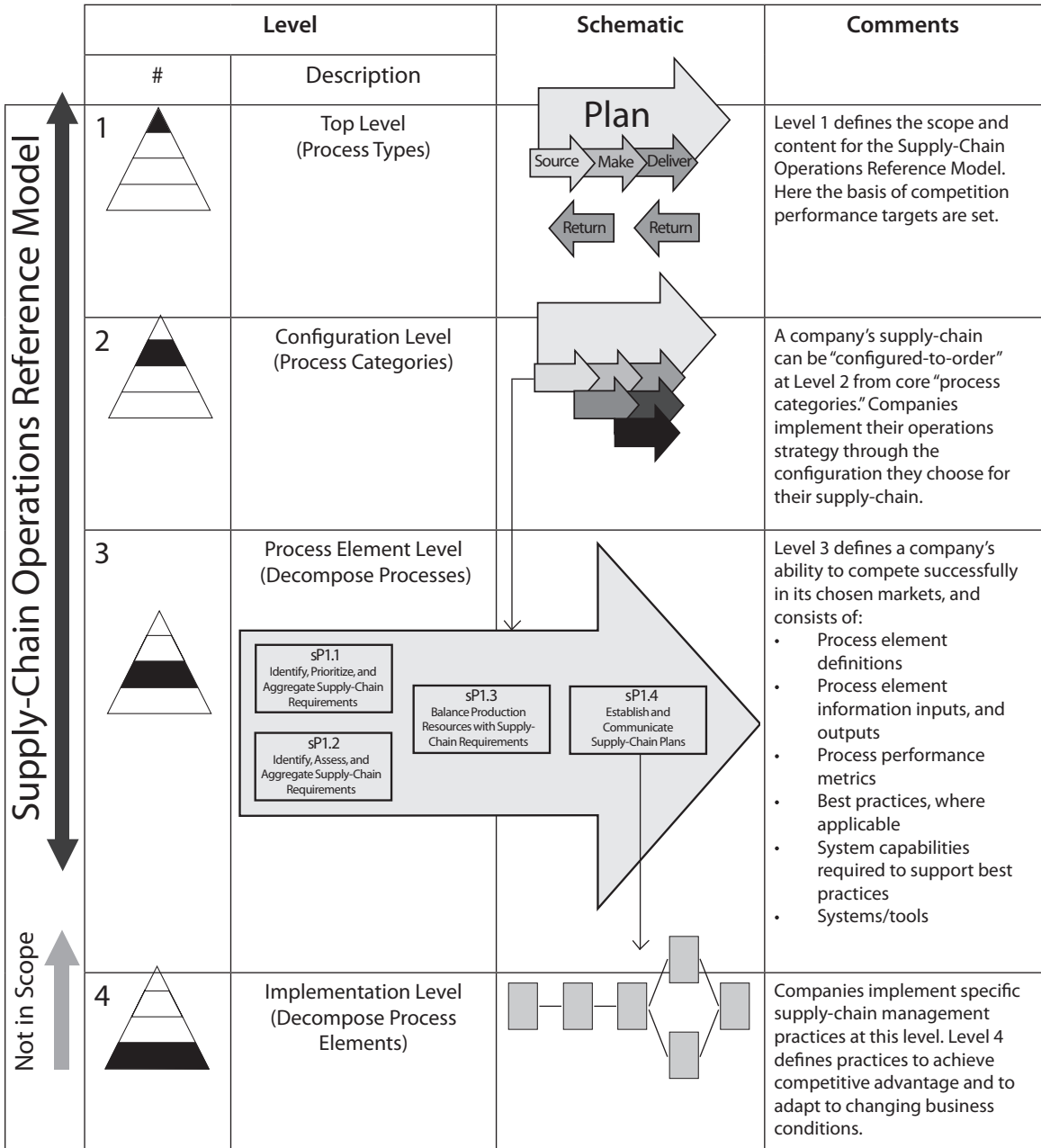


Figure 2 - SCOR is a hierarchical model with specific boundaries in regard to scope.

The SCOR-model is a business process reference model as illustrated in **Figure 3**. That is, it is a Model that links process elements, metrics, best practice and the features associated with the execution of a supply chain in a unique format. The uniqueness and power of the Model and its successful implementation is chiefly derived from using these four elements together.

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.

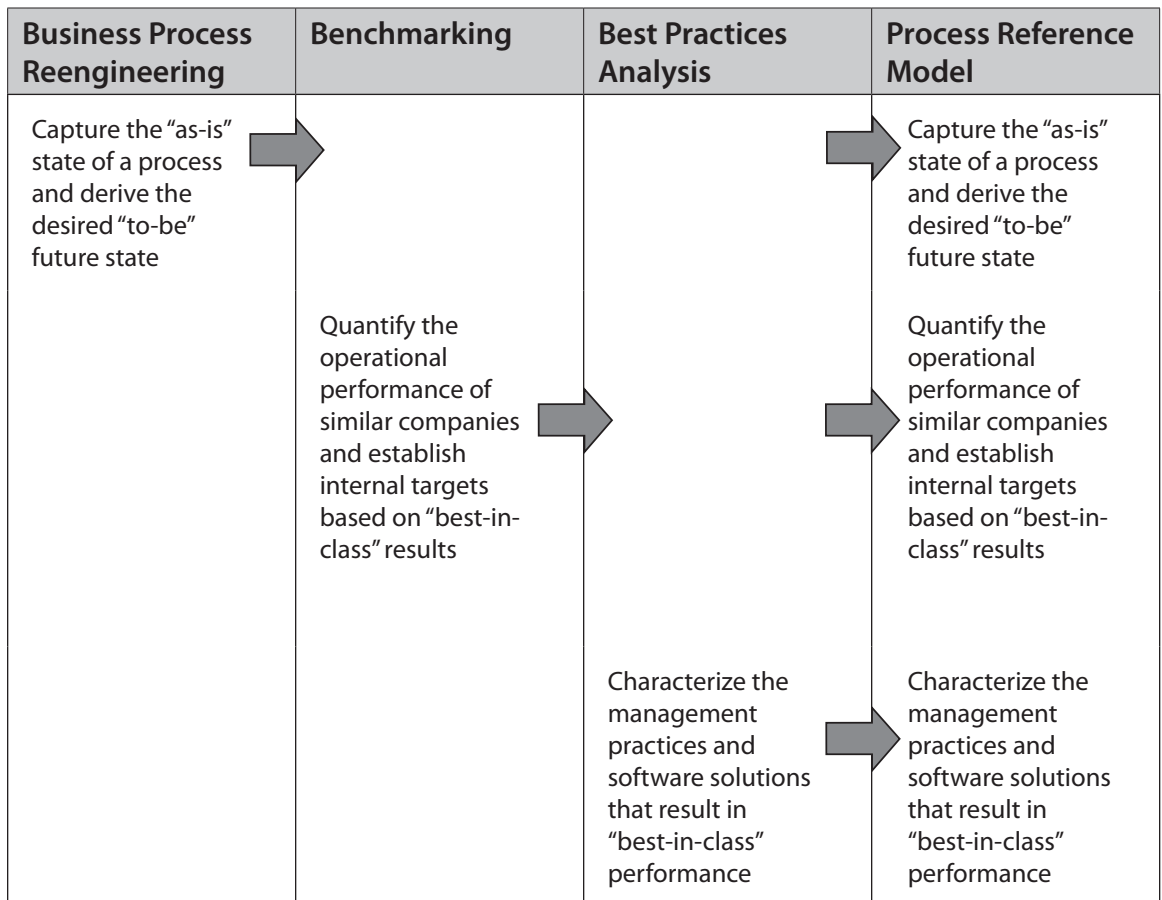


Figure 3 - SCOR is a business process reference model.

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SCOR model structure

SCOR is a reference model. The purpose of a process reference model, or business process framework, is to describe your process architecture in a way that makes sense to key business partners. Architecture here means the way processes interact, how they perform, how they are configured and the requirements (skills) on staff operating the process.

The SCOR reference model consists of 4 major components:

- Performance: Standard metrics to describe process performance and define strategic goals (Section 2)
- Processes: Standard descriptions of management processes and process relationships (Section 3)
- (Best) Practices: Management practices that produce significant better process performance (Section 4)
- People: Standard definitions for skills required to perform supply chain processes. (Section 5)

Additional SCOR contains a section for special applications. Special applications is used for approved SCOR additions that have not yet been tested thoroughly for integration into the Model, but that SCC believes would be beneficial for SCOR users.

Performance

The performance section of SCOR consists of two types of elements: Performance Attributes and Metrics. A performance attribute is a grouping of metrics used to express a strategy. An attribute itself cannot be measured; it is used to set strategic direction. Metrics measure the ability of a supply chain to achieve these strategic attributes.

Performance Attribute	Definition
Reliability	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: On-time, the right quantity, the right quality.
Responsiveness	The speed at which tasks are performed. The speed at which a supply chain provides products to the customer. Examples include cycle-time metrics.
Agility	The ability to respond to external influences, the ability to respond to marketplace changes to gain or maintain competitive advantage. SCOR Agility metrics include Flexibility and Adaptability
Costs	The cost of operating the supply chain processes. This includes labor costs, material costs, management and transportation costs. A typical cost metric is Cost of Goods Sold.
Asset Management Efficiency (Assets)	The ability to efficiently utilize assets. Asset management strategies in a supply chain include inventory reduction and in-sourcing vs. outsourcing. Metrics include: Inventory days of supply and capacity utilization.

Reliability, Responsiveness and Agility are considered customer-focused. Cost and Asset Management Efficiency are considered internal-focused.

Associated with the Performance Attributes are the Level 1 Strategic Metrics. 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 market space.

Performance Attributes and Associated Level 1 Metrics

Performance Attribute	Performance Attribute Definition	Level 1 Strategic 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 (RL.1.1)
Supply Chain Responsiveness	The speed at which a supply chain provides products to the customer.	Order Fulfillment Cycle Time (RS.1.1)
Supply Chain Agility	The agility of a supply chain in responding to marketplace changes to gain or maintain competitive advantage.	Upside Supply Chain Flexibility (AG.1.1)
		Upside Supply Chain Adaptability (AG.1.2)
		Downside Supply Chain Adaptability (AG.1.3)
		Overall Value At Risk (AG.1.4)
Supply Chain Costs	The costs associated with operating the supply chain.	Supply Chain Management Cost (CO.1.1)
		Cost of Goods Sold (CO.1.2)
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 (AM.1.1)
		Return on Supply Chain Fixed Assets (AM.1.2)
		Return on Working Capital (AM.1.3)

Figure 5 – Definitions for SCOR Performance Attributes and listing of associated 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 is diagnostic. Level 2 metrics serve as diagnostics for level 1 metrics. This means that by looking at the performances of the level 2 metrics I can explain performance gaps or improvements for level 1 metrics. 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.

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Metrics codification has been introduced in SCOR 9.0 to ensure companies may adopt SCOR metrics without the need to rename their existing metrics.

The coding starts with the performance attributes: Reliability – RL, Responsiveness – RS, Agility – AG, Cost – CO, and Asset Management – AM. Each metric starts with this two letter code, followed by a number to indicate the level, followed by a unique identifier. For example: Perfect Order Fulfillment is RL.1.1 – a level 1 metric within the Reliability attribute. Perfect Condition is RL.2.4, a Reliability metric at level 2. And Direct Material Cost is CO.3.141.

Note: The second number in the ID – for example the 141 in CO.3.141 – does NOT indicate any kind of priority, importance, or other meaning. The numbers were assigned initially alphabetically, and later based on first come first serve.

Note: Over time SCC may retire metrics, which will mean there are unassigned metric IDs. This is intended, to ensure backward compatibility to older revisions.

Processes

The Process section in SCOR provides a set of pre-defined descriptions for activities most companies perform to effectively execute their supply chains. The five macro-level SCOR processes Plan, Source, Make, Deliver and Return are well-known and widely adopted. SCOR identifies 2 more levels of process. Level here 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. Figure 2 shows the levels within the SCOR model processes.

Level 2 process categories determine the capabilities within the level 1 processes. The key level 2 processes are Make-to-Stock vs. Make-to-Order vs. Engineer-to-Order for Source, Make and Deliver processes and Defective vs. MRO vs. Excess for the Return process. Level 3 processes are process steps that are performed in a certain sequence in order to plan supply chain activities, source materials, make products, deliver goods and services and handle product returns.

Companies may develop standard process descriptions of activities within the level 3 processes – so called level 4 processes. Level 4 processes are generally industry, product, location and/or technology specific. For example: Most if not all companies need to perform a task known as “receive, enter and validate a customer order”. This is a level 3 process (for example sD1.2). The level 4 processes would describe the steps how the order was received. Examples would be EDI, fax, telephone, walk-in. Each of these may require a unique level 4 process description. Another step you would describe how the order was entered. EDI maybe automatically loaded by certain software, fax and phone orders are entered by the order desk, walk-ins are processed at the check out counter. And so on.

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: “Why do we have a warehouse feeding a warehouse, feeding a warehouse?” or “Lead-time are long due to where we source some of these materials”. Level 3 process diagrams help identify decision points, triggers and process disconnects. For example: A sourcing model where I only take inventory ownership after I shipped it to my customer – a.k.a. “supplier owned inventory” – is described at level 3. Another sourcing alternative vendor managed inventory is also defined at level 3. 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 1 processes are represented by a capital letter preceded by a the letter s (small caps): sP for Plan, sS for Source, sM for Make, sD for Deliver and sR for Return. Level 2 processes add a number for most level 2 processes: sD1 for Deliver Stocked Products, sP3 for Plan Make. Level 3 processes add a period followed by a unique number: sD1.1 for Process Inquiry and Quote, sD1.2 for Receive, Enter and Validate Order. Exceptions exist for Return processes and Enable processes: Level 2

Return processes are split into Source Return (sSRx) and Deliver Return (sDRx) processes to acknowledge the difference between returning something yourself or receiving a return from your customer. The level 3 processes are aligned with these codes: sDR1.1 is Authorize Defective Product Return. Enable processes fall within the level 1 processes Plan, Source, Make, Deliver and Return and are identified by a preceding E. For example the level 2 Enable Source process is sES. The level 3 process Assess Supplier Performance has ID sES.2

Note: Non of numbers in the ID indicate any kind of sequence, priority, importance, or other meaning. The numbers were assigned initially using an example sequence, and later based on first come first serve.

Practices

The Practices section consists of best practices organized by original objective:

- SCOR; Improving overall supply chain operational performance. These best practices focus on the Reliability, Responsiveness, Agility, Cost and/or Asset Management Efficiency performance attributes.
- GreenSCOR; Improving the environmental footprint of the supply chain.
- Risk Management; Improving (mitigating) the risks of an undesired event taking place, limiting the impact of such an event and improving the ability to recover from the event.

Best practices are best described as unique ways to configure a set of processes (Configuration), unique ways to automate a set of processes (Technology) and/or unique ways to perform a set of processes (Knowledge) that result in significant better results.

No codification exists for Best Practices at this time.

People

The People section of SCOR is new. Starting revision 10 SCOR incorporates a standard for describing skills required to perform tasks and manage processes. Generally these skills are supply chain specific. Some skills identified may be applicable outside the supply chain process domain.

Skills are described by a standard definition and association to other People aspects: Aptitudes, Experiences, Trainings and Competency level. Competency level is not included in the framework descriptions. SCOR recognizes 5 commonly accepted competency levels:

- Novice: Untrained beginner, no experience, requires and follows detailed documentation
- Beginner: Performs the work, with limited situational perception.
- Competent: Understands the work and can determine priorities to reach goals.
- Proficient: Oversees all aspects of the work and can prioritize based on situational aspects.
- Expert: Intuitive understanding. Experts 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 (person) or desired (job specification) level of competency.

Codification within the People section consists of coding of the Skills as well as the Aptitudes,

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Experiences and Trainings that define the Skills. All People elements start with a capital letter H followed by a capital letter representing the element: S for Skills, A for Aptitudes, E for Experiences and T for Trainings. These are followed by a period and a for digit number. For example HS.0010 is the code for Basic Finance skill, HT.0039 is the code for CTPAT training.

Note: The number in the ID – for example the 0018 in HA.0018 – does NOT indicate any kind of priority, importance, or other meaning. It is a unique identifier.

Using SCOR

Since the inception of the SCOR model companies have looked at how to best utilize the rich content of SCOR. Supply Chain Council has supported and continuous to support practitioners by offering training focused on the interpretation and use of SCOR. Experience tells us that SCOR as a tool needs to be integrated into existing project methodologies used, where they exist. Effective supply chain organizations have learned that using SCOR is not a business goal; it is a tool to reach the true business goal: An integrated optimized supply chain, meeting market requirements.

A typical SCOR project comprises of the following phases:

1. Understand the scope. The scope of a SCOR project is defined by the following components:
 - a. Business: Understanding the markets the supply chain serves, the products and/or services the supply chain delivers and competitive landscape for each product and market;
 - b. Configuration: Understanding the high level processes. Develop geographic maps and thread diagrams to understand material flows and supporting processes;
 - c. Performance: Understanding the areas of underperformance. Companies develop scorecards and may organize a benchmark to understand how their supply chains perform in comparison to similar supply chains;
 - d. Opportunity: Defining the improvement opportunity. Setting the scope of the effort. Focus on one or few supply chains and one or few metrics per supply chain.
 - e. Plan the next steps.
2. Investigate causes. Determine where the root causes are:
 - a. Metrics decomposition: For each problem metric identify the diagnostic metrics and collect the data to calculate these diagnostic metrics. Determine the the problem metric or metrics. Repeat this process until no more diagnostic metrics can be identified;
 - b. Process problem discovery: For all diagnostic metrics, determine the associated processes. For each process collect information about how the process operates. ('operates' not 'is supposed to operate'). Collect relevant information about who performs the work, sources or lack of relevant information to perform the work, rules and regulations that apply, tools and software supporting the process. Collect observed performance information from those who perform the work.
 - c. Classify the problems: Group relevant observed process and performance problems together and determine how this impacts the overall problem. (Cause and Effect)
 - d. Plan the next steps.
3. Identify solutions. Review different ways to solve the individual observed problems and the overall

problem.

- a. Research better practices: Determine how others have solved similar problems. Identify best practices, leading practices and software and tools that may address individual problems and/or the overall problem;
 - b. Develop what-if scenarios: Using information about alternative practices, new technology, internal knowledge and external resources* describe new ways to configure and organize the processes. (*) External resources can be paid consultancies, peers in other industries or peers in other business units in the same company. Internal resources and knowledge refers to workers in or close to the process. Some IT resources may qualify as internal resources;
 - c. Review and select: Review each scenario. Weigh improvement impact against estimated cost, risk, effort, lead-time, and feasibility. Select the appropriate (or best) solution scenario for each problem. The collection of these solutions is the strategy to resolve the overall problem.
 - d. Plan the next steps.
4. Design solutions. Document the new processes, technologies and organizations. Describe the To-Be state.
- a. Document processes: Develop the detailed transactional information.
 - b. Develop detailed process flows and descriptions. Document how the process is organized, who does what and what information is used and created in each process step.
 - c. Develop detailed work instructions. Document how the work is done. Develop Standard Operating Procedures (SOPs) for new processes. Update SOPs for all processes impacted by the change.
 - d. Document organizational designs:
 - i. Develop detailed job descriptions;
 - ii. Document authority, responsibility and span of control;
 - iii. Document training needs, develop training if needed;
 - iv. Document metrics, describe how the processes (and process owners) will be measured upon implementation of the new process.
 - e. Document technology requirements: Describe how existing and/or new technology will support the new process. A business requirements document will enable internal and/or external technology providers to match their tools to the process needs. Solution design may require significant resources and time for projects with large dependencies on technology and maybe considered separate IT projects.
 - f. Document transitions: Describe the dependencies and restrictions related to the change. Estimate resource needs
 - g. Plan the next steps.
5. Plan and launch change projects. Create a roadmap to implement the changes.
- a. Define projects: Define unique projects for implementation. Combine changes that impact the same technology, organizations, products, processes as required. Note: Not all projects are

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equal: Large scope changes need managed projects, small changes may need a memo to a manager with documentation.

- b. Critical path and dependencies: Document the interdependencies of projects. “Project D requires Project K to be completed”. “Project F can start at any time”.
- c. Manage the project portfolio. Prioritize projects based on expected return, business strategy and other relevant projects. Allocate resources; people, funds, time.
- d. Launch and oversee the projects. Make sure the project deliverables result in the desired change.

Supply Chain Council recognizes that not every SCOR project is the same. Some projects require all or most detailed activities listed to take place to ensure the project outcomes. Most projects however do not. For example: Supply chains that have previously identified realistic improvement targets do not necessarily require another round of benchmarking. Or, if the changes do not require changes to software, do not spend months on documenting the technology requirements. Work smart not hard.

Supply Chain Council provides training for different types of project environments, such as lean/six sigma. For more information review the SCC training catalog: supply-chain.org/training.

SCOR Version 10.0 Changes

Summary of Changes

Revision 10.0 introduces standard definitions for People assets to SCOR. SCOR practitioners have asked for tools to help managing the organizational impacts (the people aspect) of supply chain projects. The People reference components of SCOR standardizes the classification of skills in a supply chain. As with all new extensions and additions, practitioners are asked to use the new SCOR People elements and provide feedback about usability, accuracy and gaps.

Revision 10 furthermore incorporates the proposed changes to the numbering structure the xCOR committee proposed in 2008. As additional frameworks have been developed (E.g. DCOR - SCOR for product and process design, and CCOR - SCOR for Sales and Support) the need for a framework identifier emerged. All processes are now preceded by a small letter to indicate the framework. Starting SCOR 10.0 all SCOR process have a small 's' preceding the former process ID. For example: D1.2 (Receive, Enter and Validate Order) is now sD1.2. Supply Chain Council recommends the leading s to be silent: sD1.2 would be pronounced as "Dee One point Two". The exception would be where multiple frameworks would be within scope of conversation. Metrics and skills numbering does not require the preceding letter as metrics and skills are considered spanning multiple domains (not all but many). Best practices numbering will be included in future revisions of the SCOR models.

SCOR 10 also brings updates to the Supply Chain Risk Management component of SCOR. The risk related metrics have been revised and new best practices are introduced. Supply Chain Risk Management was originally introduced in SCOR 9.0. The Overall Value-At-Risk metric has been reclassified.

Metric	Old ID	New ID
Overall Value-At-Risk (VAR)	CO.2.6	AG.1.4
Supplier's/Customer's/Products' Risk Rating	New	AG.2.14
Value at Risk (Plan)	New	AG.2.15
Value at Risk (Source)	CO.3.192	AG.2.16
Value at Risk (Make)	CO.3.190	AG.2.17
Value at Risk (Deliver)	CO.3.189	AG.2.18
Value at Risk (Return)	CO.3.191	AG.2.19
VAR of Supplier Performance	CO.3.194	AG.2.21

Figure 6, Summary of Risk metric changes

A complete list of all changes can be found at the end of this paragraph.

Online Access

With the release of revision 10 SCOR is introducing a new way to browse the reference: Online Access. Online Access offers a true browsing experience throughout the framework. Navigation through the SCOR model will be much easier than using the PDF. Linkages between metrics, processes, practices, skills and experiences, aptitudes and training are directly accessible.

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Change #	Type of Change	SCOR Process #	Specific Change Description
1	Change	AG.1.1	Changed definition - add cost reference
2	Change	AG.1.2	Changed definition - add cost reference
3	Change	CO.3.151	Metric reclassification to AM.3.45
4	Change	RL.3.44	Metric reclassification to RS.3.142
5	Change	RS.3.51 and RS.3.52	Consolidate and Change Metric Name to RS.3.51
6	Change	RS.3.102 and RS.3.103	Consolidate and Change Metric Name to RS.3.102
7	Change	RS.3.131 and RS.3.132	Consolidate and Change Metric Name to RS.3.131
8	Add	CO.2.2	Add new L3 Hierarchy
9	Add	CO.2.3	Added new text on calculation; data collection and discussion
10	Add	CO.2.4	Add new L3 CO.3.200
11	Change	CO.2.6	Reclassification to AG.1.4
12	Add	AG.2.14	Add Supplier's/Customer's/Products' Risk Rating
13	Add	AG.2.15	Add Value at Risk (Plan)
14	Change	CO.3.192	Reclassification to AG.2.16
15	Change	CO.3.190	Reclassification to AG.2.17
16	Change	CO.3.189	Reclassification to AG.2.18
17	Change	CO.3.191	Reclassification to AG.2.19
18	Change	CO.3.194	Reclassification to AG.2.21
19	Add	AG.2.21	Add text to definition
20	Add	AG.2.21	Add Process EP.9
21	Delete	AG.2.21	Delete Process EM.9, ED.9 and ER.9
22	Add	RL.3.54	Changed definition - added text
23	Add	RL.3.54	Add Process EP.9
24	Delete	RL.3.54	Delete Process ES.9
25	Change	CO.3.193	Reclassification to AG.2.20
26	Add	AG.2.20	Add test to definition
27	Add	AG.2.20	Add process EP.9
28	Add	RL.3.30	Add text to definition
29	Delete	RL.3.30	Delete processes EM.9, ED.9, ER.9
30	Add	RL.3.29	Add text to definition
31	Delete	RL.3.29	Delete process ES.9
32	Add	RL.3.51	Add text to definition

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Change #	Type of Change	SCOR Process #	Specific Change Description
33	Delete	RL.3.51	Delete Process EM.9, ED.9 and ER.9
34	Add	AG.2.14	Add metric AG.2.14 (not currently in SCOR 9.0)
35	Add	RS.3.31	Add Process EP.9
36	Add	AG.3.55	Add Process EP.9
37	Delete	AG.3.58	Options Rating metric to be deleted
38	Add	CO.3.157	Add text to definition
39	Add	CO.3.157	Add Process ES.9
40	Add	CO.3.154	Add Process ES.9
41	Add	CO.2.7	Added Metric Co.2.7 (not currently in SCOR 9.0)
42	Change	CO.3.149	Reclassification to AG.2.22
43	Change	CO.3.156	Reclassification to AG.2.23
44	Add	Risk Management Best Practice	Added Bowtie Risk Management
45	Add	Risk Management Best Practice	Added Risk Program Monitoring
46	Add	Risk Management Best Practice	Added Network Prioritization for Risk identification
47	Change	AM3.28 - 3.44	Metric Name + some text updates
48	Change	P3.2	Change cost metric text name
49	Change	P3.1	Workflow change
50	Delete	P5.2	responsiveness metric Balance Return Resources with Return Requirements Cycle Time
51	Delete	P5.3	Delete cost metric Cost to Identify, Assess, and Aggregate Return Resources
52	Change	M1.4	Workflow change
53	Change	M2.4	Workflow change
54	Change	M3.6	Workflow change
55	Change	S1.4	Workflow change
56	Change	S2.4	Workflow change
57	Change	S3.6	Workflow change
58	Change	D1.8	Workflow change
59	Change	D1.9	Workflow change
60	Change	D2.8	Workflow change
61	Change	D2.9	Workflow change
62	Change	D3.8	Workflow change
63	Change	D3.9	Workflow change

Introduction

Change #	Type of Change	SCOR Process #	Specific Change Description
64	Change	Metrics Intro	insert between metrics tab and reliability tab
65	Change	Processes intro	insert between processes tab and plan tab
66	Change	Practices intro	insert between practices tab and SCOR tab
67	Change	Section 5 Special Applications	renumber Section 5 to 6
68	Add	Section 5 Skills	Insert new section 5 Skills (all skills pages)
69	Add	New Tab 5	Add People
70	Change	Artwork	714 pixels
71	Change	Artwork	PNG format
72	Change	Artwork	Transparent background
73	Change	Printed version	Scalable for typesetter
74	Change	RS.3.51	Add D1.11 - D1.11: Load Vehicle & Generate Shipping Documentation
75	Change	Copyright	Mass Modify from 2008 to 2010 on all pages
76	Change	adding a small s for all processes in the document	P1, P2, P3, P4, P5, EP, D1, D2, D3, D4, ED, M1, M2, M3, EM, S1, S2, S3, ES, SR1, SR2, SR3, DR1, DR2, DR3, ER
77	Change	Acknowledgement Page	Modify to the new spreadsheet names and company name
78	Add	People Introduction	insert between People 5.0 tab

The Technical Change Process

The SCOR-model is developed and maintained by the voluntary efforts of the Supply Chain Council (SCC) members. Unlike other organizations with large technical staffs, the Council 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. SCOR-model versions prior to Version 6.0 were developed in a Committee structure that was focused on developing a stable, usable Model that could be used by experienced Council members as well as organizations newly introduced to the SCOR concept. In 2002, confident that the Model's stability had been demonstrated with over 5 years of application experience by Council members, the Supply Chain Council shifted its technical development focus to specific implementation issues.

Today, the current technical development process relies on project teams composed of volunteers from Supply Chain Council member organizations. These project teams are short-lived groups that focus on specific model challenges. It is expected that the normal term of a project team will be between 3-6 months. The change process and the coordination of the project team activities is led by a group of elected volunteers, supported by a SCC project member (staff). Changes to the model are initiated by a Council member or members. The primary mechanism for changing the Model is the Project Team. These teams propose areas of investigation, pursue and develop proposals for Model development and publish research results on the Council website.

SCOR users (practitioners) can also provide feedback through the Supply Chain Council's website (Online Access). Member users can add comments to the SCOR metrics, processes, practices and skills. For more information about Online Access: <http://supply-chain.org/online-access>

Section 2

Metrics

Introduction to Metrics

The performance section of SCOR consists of two types of elements: Performance Attributes (attributes) and Metrics.

Performance Attribute

A performance attribute is a grouping of metrics used to express a strategy. An attribute itself cannot be measured; it is used to set strategic direction. For example: “The LX product needs to be best-in-class for reliability” and “The xy- market requires us to be among the top 10 agile manufacturers”. Metrics measure the ability to achieve these strategic directions.

Metric

A metric is a standard for measurement of the performance of a process. SCOR metrics are diagnostic metrics. SCOR recognizes three levels of pre-defined metrics:

- Level 1 metrics are diagnostics for the overall health of the supply chain. These metrics are also known as strategic metrics and key performance indicators (KPI). Benchmarking level 1 metrics helps establishing realistic targets to support the strategic directions.
- Level 2 metrics serve as diagnostics for the level 1 metrics. The diagnostic relationship helps to identify the root cause or causes of a performance gap for a level 1 metric.
- Level 3 metrics serve as diagnostics for level 2 metrics.

The analysis of performance of metrics from level 1 through 3 is referred to as decomposition. Decomposition helps identify the processes that need to be future studied. (Processes are linked to level 1 and level 2 metrics).

SCOR recognizes 5 performance attributes:

Reliability

The Reliability attribute addresses 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: On-time, the right quantity, the right quality. The SCOR key performance indicator (level 1 metric) is Perfect Order Fulfillment. Reliability is a customer focused attribute.

Responsiveness

The Responsiveness attribute describes the speed at which tasks are performed. Responsiveness addresses repeated speed of doing business. Agility describes a different speed, the speed to change the supply chain. Example metrics are cycle time metrics. The SCOR key performance indicator is Order Fulfillment Cycle Time. Responsiveness is a customer focused attribute.

Agility

The Agility attribute describes the ability to respond to external influences; the ability to change. External influences include: Non-forecastable increases or decreases in demand, suppliers or partners going out of business, natural disasters, acts of (cyber) terrorism, availability of financial

Metrics

tools (the economy), labor issues. The SCOR key performance indicators include Flexibility and Adaptability. Agility is a customer focused attribute.

Cost

The Cost attribute describes the cost of operating the process. Typical cost includes labor cost, material cost, transportation cost. The SCOR key performance indicators are Cost of Goods Sold and Supply Chain Management Cost. These two indicators cover all supply chain spend. Cost is an internal focused attribute.

Assets

The Asset Management Efficiency ('Assets') attribute describes the ability to efficiently utilize assets. Asset management strategies in supply chain include inventory reduction and in source vs. outsource. Example metrics include: Inventory days of supply, capacity utilization. The SCOR key performance indicators include: Cash-to-Cash Cycle Time, Return on Fixed Assets. Asset Management Efficiency is an internal focused attribute.

Supply Chain Council recommends supply chain scorecards to contain at least one (1) metric for each performance attribute to ensure balanced decision making and governance.

Perfect Order Fulfillment

The percentage of orders meeting delivery performance with complete and accurate documentation and no delivery damage. Components include all items and quantities on-time using the customer's definition of on-time, and documentation – packing slips, bills of lading, invoices, etc.

Qualitative Relationship Description

- An order is considered perfect if the products ordered are the products provided and the quantities ordered match the quantities provided (% In Full).
- A delivery is considered perfect if the location, specified customer entity and delivery time ordered is met upon receipt (Delivery Performance to Customer Commit Date).
- Documentation supporting the order line is considered perfect if it is all accurate, complete, and on time (Accurate Documentation).
- The product condition is considered perfect if the product is delivered / faultlessly installed (as applicable) on specification, with the correct configuration, with no damage, customer ready, and is accepted by the customer (Perfect Condition)

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

$[Total\ Perfect\ Orders] / [Total\ Number\ of\ Orders] \times 100\%$

Note, an Order is Perfect if the individual line items making up that order are all perfect.

The Perfect Order Fulfillment calculation is based on the performance of each Level 2 component of the order line to be calculated (product & quantity, date & time & Customer, documentation and condition). For an order line to be perfect, all of the individual components must be perfect.

The calculation of line item perfect order line fulfillment is based on the Level 2 components:

- Each component receives a score of 1 if it is judged to be perfect.
- It receives a score of 0 if not perfect.

If the sum of the scores equal the number of components (in this case, 4) the order line is perfectly fulfilled.

Data Collection

Data for the components that are used to drive the calculation of supply chain performance are primarily taken from Deliver and impact Deliver Enable process elements. These are primarily associated with the original commitment (Customer Order Processing – sD1.2, sD 2.2, sD3.3) and the satisfaction of that commitment (Receipt and Installation (as appropriate) – sD1.11, sD1.13, sD1.14, sD1.15, sD2.11, sD2.13, sD2.14, sD2.15, sD3.11, sD3.13, sD3.14, sD3.15). In addition, the documents necessary for support of the supply chain process should be scored across the set of Deliver process elements. The Enable Deliver Process Element - Assess Delivery Performance (sED.2) should be updated from metrics derived.

RL.1.1

Discussion

The performance of the supply chain is considered “perfect” if the original commitment made to a customer is met through the supply chain.

An order is defined as a collection of one or more order lines representing a request to deliver specified quantities of goods or to render specific services. The order can further be defined as a request (with a specific identifier as a reference) to deliver specified items or to render specific services with specific prices, dates, and quantities. Commitments are made to a customer at the order line level, where an order line is defined as a line representing a commitment on a sales order. An order line always references a product or service.

For an order to be considered perfect the following standards must be met:

- Delivered complete; all items on the order line are delivered in the quantities specified
- Delivered on time to the initial commitment date, using the customer’s definition of on-time delivery
- Documentation supporting the order including packing slips, bills of lading, invoices, quality certifications, etc., is complete and accurate
- Faultlessly installed (as applicable), correct configuration, customer-ready and accepted, no damage, on specification

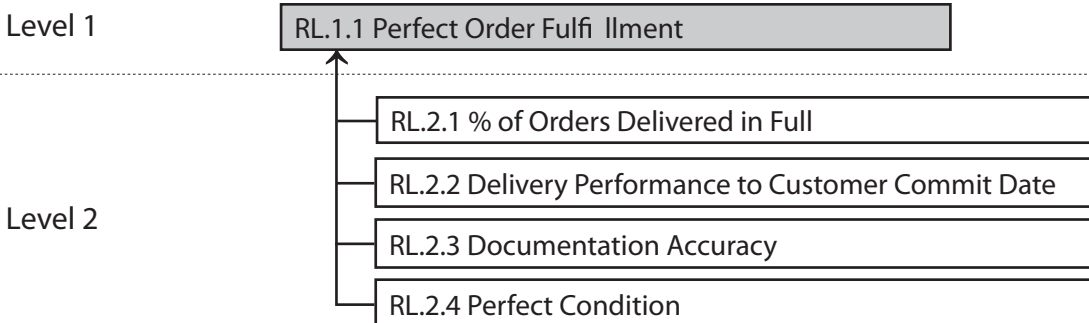
Orders canceled by the customer are excluded from the metric. Order changes initiated by the customer and agreed to by the supplier supersede initial commitments and form a new comparative basis for the metric.

Often for date and quantity issues (and occasionally product), a range rather than a strict value is used. This is acknowledged as a standard practice; in those situations the standard measured is considered to be met perfectly if the range specified is satisfied.

The term “customer-ready” for the perfect condition standard may imply a subjective component based on the customer’s satisfaction. Although condition may not be as rigorously measured as time or quantity it should be considered as a component if available, especially since this attribute measures performance of the supply chain which is, of course, ultimately measured by its customers.

It should also be noted that a corresponding evaluation of suppliers’ performances could be determined by extending these standards to each supplier’s ability to source products.

Hierarchical Metric Structure



% of Orders Delivered In Full

Percentage of orders which all of the items are received by customer in the quantities committed

Qualitative Relationship Description

An order is considered delivered “in full” if:

- All items ordered are the items actually provided, and no extra items are provided
- All quantities received by the customer match the order quantities (within mutually agreed tolerances)

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

$[Total\ number\ of\ orders\ delivered\ in\ full] / [Total\ number\ of\ orders\ delivered] \times 100\%$

Data Collection

Data for the components that are used to drive the calculation of % In Full are primarily associated with the original order processing step of ‘Reserve inventory and Determine Delivery Date’ (sD1.3, sD2.3 & sD3.3), inventory availability (sM1.1, sM2.1, sM3.1) including inventory location accuracy, (sED.4), and the satisfaction of that commitment through the shipment and customer receiving processes (sD 1.12, sD1.13, sD2.12, sD.2.13, sD3.12, sD3.13)

Discussion

Order quantities are based on item / quantity original commitments agreed to by the customer. Orders canceled by the customer are excluded from the metric. Order changes initiated by the customer and agreed to by the supplier supersede original commitments and form a new comparative basis for the metric. This metric has no “timing” element, such that orders deliberately split by the supplier should still be considered “in full” so long as all metric criteria are met. In some cases, such as for supplying bulk materials, committed quantities refer to a range that is acceptable to the customer rather than a strict value.

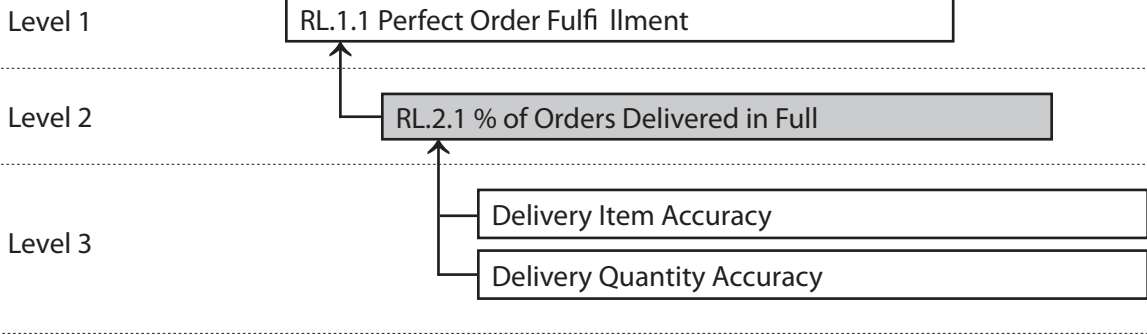
Several SCOR diagnostic metrics exist that can be used to focus “% In Full” improvement efforts. Some of these include:

- % Orders Scheduled to Requested Quantity
- Schedule Achievement
- Yield variability
- Planned Shipment Fill Rate (not yet defined)
- % Stock Outs (not yet defined)
- Inventory Cycle Count Accuracy (not yet defined)

Orders may not be filled completely to the customer’s original request quantity due to the inability to schedule to the initial request. Breakdown may also occur from the inventory availability (including stock outs for MTS and schedule achievement for MTO and ETO) and inventory location accuracy. Lastly, a deviation from the shipment plan may lead to inability to fulfill an order completely.

RL.2.1

Hierarchical Metric Structure



Delivery Performance to Customer Commit Date

The percentage of orders that are fulfilled on the customer’s originally scheduled or committed date

Qualitative Relationship Description
An order is considered delivered to the original Customer commitment date if: <ul style="list-style-type: none"> • The order is received on time as defined by the customer • The delivery is made to the correct location and Customer entity
Quantitative Relationship (optional, if calculable)
None Identified
Calculation
$\frac{[\text{Total number of orders delivered on the original commitment date}]}{[\text{Total number of orders delivered}]} \times 100\%$
Data Collection
Data for the components that are used to drive the calculation of Delivery Performance to Customer Commit Date are primarily associated with the original order processing step of ‘Reserve inventory and Determine Delivery date’ (sD1.3, sD2.3 & sD3.3), and the satisfaction of that commitment through the shipment and customer receiving processes (sD 1.12, sD1.13, sD2.12, sD2.13, sD3.12, sD3.13).
Discussion
<p>Order delivery performance from a timing perspective is based on original commitments agreed to by the customer. The acceptable window for delivering on time should be defined in the customer’s service level agreement. Orders canceled by the customer are excluded from the metric. Order changes impacting the timing of a delivery that are initiated by the customer and agreed to by the supplier supersede original commitments and form a new comparative basis for the metric. The original commitment date can refer to a range, rather than a strict date and time, that is acceptable to the customer (e.g. advanced shipments). This metric has no “In Full” element, such that partial deliveries can still be considered as meeting the Customer Commit Date so long as all metric criteria are met. Measuring the frequency of accepting the customer’s original request date, vs. commit date, can be an important measure of customer satisfaction.</p> <p>Several SCOR diagnostic metrics exist that can be used to focus delivery performance improvement efforts. Some of these include:</p> <ul style="list-style-type: none"> • % Orders Scheduled to Request • % Orders Shipped on time (not yet defined) • Carrier Performance Reliability (not yet defined) <p>Orders may not be delivered to the Customer Commit Date due to breakdowns in the order fulfillment and shipment process (e.g. Transportation availability). Orders may also be delivered late due to carrier delivery performance / issues.</p>

RL.2.2

Hierarchical Metric Structure

Level 1

RL.1.1 Perfect Order Fulfillment

Level 2

RL.2.2 Delivery Performance to Customer Commit date

Level 3

Customer Commit Date Achievement
Time customer Receiving

Delivery Location Accuracy

Documentation Accuracy

Percentage of orders with accurate documentation supporting the order, including packing slips, bills of lading, invoices, etc.

Qualitative Relationship Description

An order is considered to have accurate documentation when the following are accepted by the customer:

- Shipping documentation
- Payment documentation
- Compliance documentation
- Other required documentation

All documentation must be complete, correct, and readily available when and how expected by the customer, Government and other supply chain regulatory entities.

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

$$\frac{[\text{Total number of orders delivered with accurate documentation}]}{[\text{Total number of orders delivered}]} \times 100\%$$

Document supporting the order includes:

- Shipping documentation:
 - Packing slips (Customers)
 - Bill of lading (Carriers)
 - Government or Customs documentation / forms
- Payment Documentation:
 - Invoice
 - Contractual outline agreement
- Compliance documentation
 - Material Safety Data Sheets
- Other required documentation
 - Quality certification

Data Collection

Data for the components that are used to drive the calculation of Accurate Documentation are primarily associated with the Deliver processing step of 'Load Product & Generate Shipping Documentation' (sD1.11, sD2.11, sD3.11), and 'Invoice' (sD1.15, sD2.15, sD3.15).

The data collection step is part of Assess Delivery Performance (sED2) and Manage Deliver Information (sED3)

RL.2.3

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.

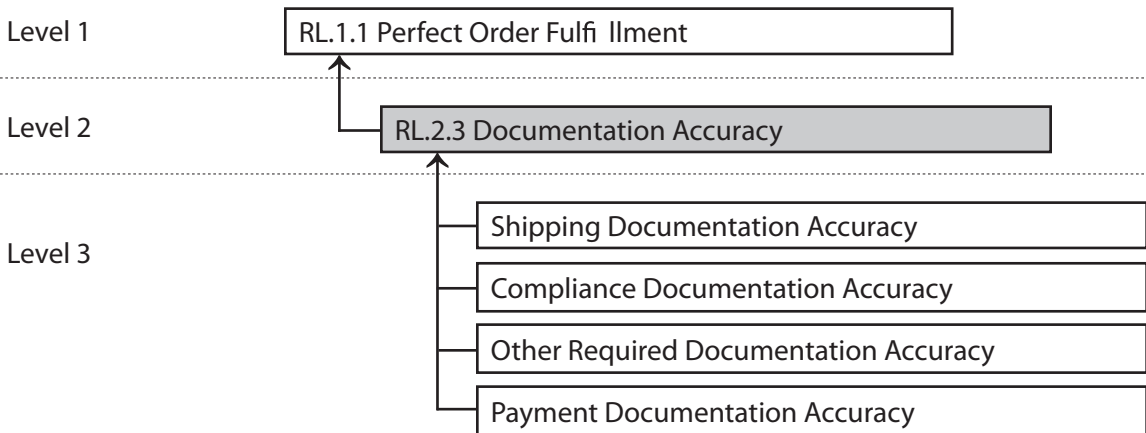
The definition encompasses On time and Accurate documentation. However, on-time documentation implies a scheduled ship date and scheduled invoice date.

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



Perfect Condition

Percentage of orders delivered in an undamaged state that meet specification, have the correct configuration, are faultlessly installed (as applicable), and accepted by the customer

Qualitative Relationship Description

An order is considered to be delivered in perfect condition if all items meet the following criteria:

- Undamaged
- Meet specification and has correct configuration (as applicable)
- Faultlessly installed (as applicable) and accepted by the customer
- Not returned for repair or replacement (within the warranty period)

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

$$\left[\text{Number of orders delivered in Perfect Condition} \right] / \left[\text{Number of orders delivered} \right] \times 100\%$$

Data Collection

Data for the components that are used to drive the calculation of “Perfect Condition” are primarily associated with the receipt, installation (as applicable) and satisfaction of the order commitment (sD1.13, sD1.14, sD2.13, sD2.14, sD3.13, sD3.14). The Enable Deliver Process Element - Assess Delivery Performance (sED.2) should be updated to reflect this metric and its components.

This data is typically available from a complaints, claims, or warranty/returns database.

Discussion

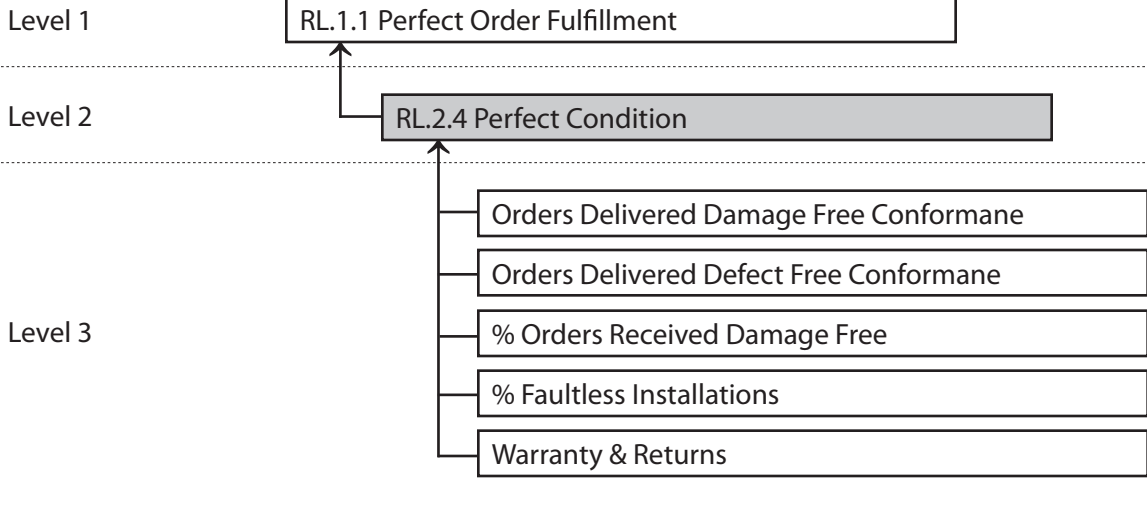
This metric, calculated at the order level, assesses the quality of products delivered through the supply chain from the customer’s perspective. Justified and non-justified product quality issues, claims and returns within the warranty period are included and count against this metric. Improving this metric lowers the supply chain cost associated with claims and returns.

Several SCOR diagnostic metrics exist that can be used to focus Perfect Condition improvement efforts. Some of these include:

- Cost of Noncompliance
- Damage and Shrinkage
- Scrap Expense
- Warranty Costs
- Yield Variability

RL.2.4

Hierarchical Metric Structure



Level 3 Reliability Metrics

Metric ID	Metric Name	Metric Definition	Process
RL.3.1	# of complaints regarding missing environmental documentation	The number of products released without proper environmental documentation as a percent of total products released	sM1.6: Release Product to Deliver
RL.3.2	# of recordkeeping related NOVs	The number of recordkeeping related regulatory violations received per year	sM1.6: Release Product to Deliver
RL.3.3	# of staff-related environmental violations	The number of environmental violations per year that are a result of personnel error or improper training	sEM.2: Manage Production Performance
RL.3.4	% correct material documentation	The percent of total shipments that include the correct environmental documentation	sD1.10: Pack Product sD2.9: Pick Product sD3.8: Receive Product from Source or Make
RL.3.5	% Error-free Returns Shipped	% Error-free Returns Shipped	sSR2.5: Return MRO Product sSR1.5: Return Defective Product sSR3.5: Return Excess Product
RL.3.6	% Identified MRO Products Returned To Service	% Identified MRO Products Returned To Service	sSR2.2: Disposition MRO Product
RL.3.7	% Item Location Accuracy	% Item Location Accuracy	sD4.5: Fill Shopping Cart
RL.3.8	% of assets in compliance with scheduled maintenance requirements	The percent of capital equipment that is in compliance with manufacturer recommended maintenance requirements or maintenance best practice requirements.	sES.5: Manage Capital Assets
RL.3.9	% of employees trained on environmental requirements	The number of employees trained on environmental requirements as a percent of total Make employees	sEM.8: Manage Make Regulatory Environment
RL.3.10	% of Excess Product Returns Delivered Complete to the Designated Return Center	Correct destination, according to the schedule, with the correct part and documentation	sDR3: Deliver Return Excess Product sSR3: Source Return Excess Product

Metric ID	Metric Name	Metric Definition	Process
RL.3.11	% of Faultless Invoices	The number of invoices processed without issues and or errors divided by the total number of invoices. Examples of potential invoice defects are: Change from customer purchase order without proper customer involvement Wrong Customer Information (e.g., name, address, telephone number) Wrong Product Information (e.g., part number, product description) Wrong Price (e.g., discounts not applied) Wrong Quantity or Wrong Terms or Wrong Date	sD1.15: Invoice sD2.15: Invoice sD3.15: Invoice
RL.3.12	% Of Faultless Installations	Number of Faultless Installations divided by Total Number of Units Installed.	sD1.14: Install Product sD2.14: Install Product
RL.3.13	% of MRO returns delivered to the correct service provider location	% of MRO returns delivered to the correct service provider location, within schedule, with the correct part and documentation	sDR2: Deliver Return MRO Product
RL.3.14	% of products meeting specified environmental performance requirements	The number of products that meet desired environmental performance specifications as a per cent of total products produced	sM2.6: Release Finished Product to Deliver
RL.3.15	% of products with proper environmental labeling (if required)	The number of products with proper environmental labels in place as a per cent of total products produced	sM2.6: Release Finished Product to Deliver
RL.3.16	% of suppliers meeting environmental metrics/criteria	Number of suppliers that completely meet agreement environmental criteria divided by the total number of suppliers used.	sES.7: Manage Supplier Network sES.2: Assess Supplier Performance sD2.7: Select Carriers and Rate Shipments sES.10: Manage Supplier Agreements sD1.7: Select Carriers and Rate Shipments
RL.3.17	% of suppliers with an EMS or ISO 14001 certification	Percent of suppliers used that have a validated Environmental Management System or ISO 14000 certification	sS3.2: Select Final Supplier (S) and Negotiate sS3.1: Identify Sources of Supply
RL.3.18	% Orders/ Lines Processed Complete	The number of orders / lines that are processed complete divided by the total orders / lines processed within the measurement period	sS2.2: Receive Product sS1.2: Receive Product sS3.4: Receive Product

Metric ID	Metric Name	Metric Definition	Process
RL.3.19	% Orders/ Lines Received Defect Free	The number of orders / lines that are received defect free divided by the total orders / lines processed in the measurement period.	sS1.3: Verify Product sS2.3: Verify Product sS3.5: Verify Product
RL.3.20	% Orders/ Lines Received On-Time To Demand Requirement	The number of orders / lines that are received on-time to the demand requirements divided by the total orders / lines for the demand requirements in the measurement period	sS1.2: Receive Product sS2.2: Receive Product sS3.4: Receive Product
RL.3.21	% Orders/ lines received with correct content	Percent of orders or lines received that have the correct material content as specified in the product design specs and supplier agreements.	sS1.3: Verify Product sS2.3: Verify Product sS3.5: Verify Product
RL.3.22	% Orders/ lines received with correct packaging	Percent of orders or lines received that are packaged correctly with the right type and quantity of packaging material.	sS1.2: Receive Product sS2.2: Receive Product sS3.4: Receive Product
RL.3.23	% Orders/ Lines Received with Correct Shipping Documents	The number of orders / lines that are received on-time with correct shipping documents divided by the total orders / lines processed in the measurement period	sS1.2: Receive Product sS2.2: Receive Product sS3.4: Receive Product
RL.3.24	% Orders/ lines received damage free	The number of orders / lines that are processed damage free divided by the total orders / lines processed in the measurement period	sS1.3: Verify Product sS2.3: Verify Product sS3.5: Verify Product
RL.3.25	% Product Transferred On-Time to Demand Requirement	The number of product orders / lines that are transferred on-time to demand requirements divided by the total orders / lines transferred in the measurement period	sS1.4: Transfer Product sS2.4: Transfer Product sS3.6: Transfer Product
RL.3.26	% Product Transferred without Transaction Errors	The number of transactions processed without error divided by the total transactions processed in the measurement period.	sS1.4: Transfer Product sS2.4: Transfer Product sS3.6: Transfer Product
RL.3.27	% Schedules Changed within Supplier's Lead Time	The number of schedules that are changed within the suppliers lead-time divided by the total number of schedules generated within the measurement period	sS1.1: Schedule Product Deliveries sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries

Metric ID	Metric Name	Metric Definition	Process
RL.3.28	% Shipping Schedules that Support Customer Required Return by Date	% Shipping Schedules that Support Customer Required Return by Date	sSR1.4: Schedule Defective Product Shipment sSR2.4: Schedule MRO Shipment sSR3.4: Schedule Excess Product Shipment
RL.3.29	Age of Product / Customer Risk Data (months)	The age in months of the product of customer risk data i.e. audit age, assessments, performance, etc. An average for the process area can be used to evaluate freshness of the data. For example: the date of the last audit for a customer, the age of the performance data, the age of the 3rd party data, etc.	sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
RL.3.30	Age of Supplier Risk Data (months)	The age in months of the supplier risk data i.e. audit age, assessments, performance, etc. An average for the process area can be used to evaluate freshness of the data. For example: the date of the last audit for a supplier, the age of the performance data, the age of the 3rd party data, etc	sES.9: Manage Supply Chain Source Risk
RL.3.31	Compliance Documentation Accuracy	Percentage of compliance documentations are complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. Compliance documentations includes material safety data sheets	sD1.11: Load Vehicle & Generate Shipping Documentation sD2.11: Load Product & Generate Shipping Documentation sD3.11: Load Product & Generate Shipping Documents sM1.4: Package sM2.4: Package sM3.5: Package
RL.3.32	Customer Commit Date Achievement Time Customer Receiving	Percentage of orders which is received on time as defined by the customer	sD1.13: Receive & Verify Product by Customer sD2.13: Receive & Verify Product by Customer sD3.13: Receive & Verify Product by Customer

Metric ID	Metric Name	Metric Definition	Process
RL.3.33	Delivery Item Accuracy	Percentage of orders in which all items ordered are the items actually provided, and no extra items are provided	<p>sD1.2: Receive, Enter & Validate Order</p> <p>sD1.4: Consolidate Orders</p> <p>sD1.11: Load Vehicle & Generate Shipping Documentation</p> <p>sD1.12: Ship Product</p> <p>sD1.13: Receive & Verify Product by Customer</p> <p>sD2.2: Receive, Configure, Enter & Validate Order</p> <p>sD2.4: Consolidate Orders</p> <p>sD2.11: Load Product & Generate Shipping Documentation</p> <p>sD2.12: Ship Product</p> <p>sD2.13: Receive & Verify Product by Customer</p> <p>sD3.3: Enter Order, Commit Resources & Launch Program</p> <p>sD3.6: Route Shipments</p> <p>sD3.11: Load Product & Generate Shipping Documents</p> <p>sD3.12: Ship Product</p> <p>sD3.13: Receive & Verify Product by Customer</p>
RL.3.34	Delivery Location Accuracy	Percentage of orders which is delivered to the correct location and customer entity	<p>sD1.2: Receive, Enter & Validate Order</p> <p>sD1.4: Consolidate Orders</p> <p>sD1.11: Load Vehicle & Generate Shipping Documentation</p> <p>sD1.12: Ship Product</p> <p>sD1.13: Receive & Verify Product by Customer</p> <p>sD2.2: Receive, Configure, Enter & Validate Order</p> <p>sD2.4: Consolidate Orders</p> <p>sD2.11: Load Product & Generate Shipping Documentation</p> <p>sD2.12: Ship Product</p> <p>sD2.13: Receive & Verify Product by Customer</p> <p>sD3.3: Enter Order, Commit Resources & Launch Program</p> <p>sD3.6: Route Shipments</p> <p>sD3.11: Load Product & Generate Shipping Documents</p> <p>sD3.12: Ship Product</p> <p>sD3.13: Receive & Verify Product by Customer</p>

Metric ID	Metric Name	Metric Definition	Process
RL.3.35	Delivery Quantity Accuracy	Percentage of orders in which all quantities received by the customer match the order quantities (within mutually agreed tolerances)	<p>sD1.2: Receive, Enter & Validate Order</p> <p>sD1.4: Consolidate Orders</p> <p>sD1.11: Load Vehicle & Generate Shipping Documentation</p> <p>sD1.12: Ship Product</p> <p>sD1.13: Receive & Verify Product by Customer</p> <p>sD2.2: Receive, Configure, Enter & Validate Order</p> <p>sD2.4: Consolidate Orders</p> <p>sD2.11: Load Product & Generate Shipping Documentation</p> <p>sD2.12: Ship Product</p> <p>sD2.13: Receive & Verify Product by Customer</p> <p>sD3.3: Enter Order, Commit Resources & Launch Program</p> <p>sD3.6: Route Shipments</p> <p>sD3.11: Load Product & Generate Shipping Documents</p> <p>sD3.12: Ship Product</p> <p>sD3.13: Receive & Verify Product by Customer</p>
RL.3.36	Fill Rate	The percentage of ship-from-stock orders shipped within 24 hours of order receipt. For services, this metric is the proportion for services that are filled so that the service is completed within 24 hours	<p>sP1.3: Balance Supply Chain Resources with SC Requirements</p> <p>sP4.4: Establish Delivery Plans</p> <p>sM1.3: Produce and Test</p> <p>sD1.3: Reserve Inventory and Determine Delivery Date</p> <p>sD1.9: Pick Product</p>
RL.3.37	Forecast Accuracy	Forecast accuracy is calculated for products and/or families for markets/distribution channels, in unit measurement. Common calculation $(\text{Sum Actuals} - \text{Sum of Variance}) / \text{Sum Actuals}$ to determine percentage error. *monitoring the delta of Forecast Accuracy over measured time periods can determine success rates.	<p>sP1.1: Identify, Prioritize and Aggregate SC Requirements</p> <p>sP2.1: Identify, Prioritize and Aggregate Product Requirements</p> <p>sP3.1: Identify, Prioritize and Aggregate Production Requirements</p> <p>sP4.1: Identify, Prioritize and Aggregate Delivery Requirements</p> <p>sP4.2: Identify, Assess and Aggregate Delivery Resources</p> <p>sEP4: Manage Integrated Supply Chain Inventory</p> <p>sEP5: Manage Integrated Supply Chain Capital Assets</p> <p>sEP6: Manage Integrated Supply Chain Transportation</p> <p>sEP7: Manage Planning Configuration</p>

Metric ID	Metric Name	Metric Definition	Process
RL.3.38	Number of notices of violation received	Number of violations issued by regulatory authorities per 12 month period	sEP8: Manage Plan Regulatory Requirements and Compliance
RL.3.40	Number of occurrences where excessive inventory is returned and followed	Number of occurrences where excessive inventory is returned and followed	sSR3.1: Identify Excess Product Condition
RL.3.41	Orders Delivered Damage Free Conformance	Percentage of orders which is delivered without damage	sD1.13: Receive and Verify Product by Customer sD2.13: Receive and Verify Product by Customer sD3.13: Receive and Verify Product by Customer
RL.3.42	Orders Delivered Defect Free Conformance	Percentage of orders which is delivered without defect	sD1.13: Receive and Verify Product by Customer sD2.13: Receive and Verify Product by Customer sD3.13: Receive and Verify Product by Customer
RL.3.43	Other Required Documentation Accuracy	Percentage of other required documentations (besides of compliance documentation, payment documentation and shipping documentation) are complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. This kind of documentations includes quality certification	sD1.11: Load Vehicle & Generate Shipping Documentation sD2.11: Load Product & Generate Shipping Documentation sD3.11: Load Product & Generate Shipping Documents
RL.3.45	Payment Documentation Accuracy	Percentage of payment documentations are complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. Payment documentations includes invoice, contractual outline agreement	sD1.11: Load Vehicle & Generate Shipping Documentation sD2.11: Load Product & Generate Shipping Documentation sD3.11: Load Product & Generate Shipping Documents
RL.3.46	Reportable Release Incidents	Number of reportable air, water, or solid waste accidental releases per year	sED.5: Manage Deliver Capital Assets
RL.3.47	Return Shipments Shipped on Time	Return Shipments Shipped on Time	sSR1.5: Return Defective Product sSR2.5: Return MRO Product sSR3.5: Return Excess Product

Metric ID	Metric Name	Metric Definition	Process
RL.3.48	Risk Mitigation Plan	% of sources with documented contingency plans and % of sourced items with alternate or redundant sources	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
RL.3.49	Schedule Achievement	The percentage of time that a plant achieves its production schedule. This calculation is based on the number of scheduled end-items or total volume for a specific period. Note: over-shipments do not make up for under-shipments.	sM1.1: Schedule Production Activities sM2.1: Schedule Production Activities sM3.2: Schedule Production Activities
RL.3.50	Shipping Documentation Accuracy	Percentage of shipping documentations are complete, correct, and readily available when and how expected by customer, Government and other supply chain regulatory entities. Shipping documentations includes packing slips (customers), bill of lading (carriers) and government or customs documentation / forms	sD1.11: Load Vehicle & Generate Shipping Documentation sD2.11: Load Product & Generate Shipping Documentation sD3.11: Load Product & Generate Shipping Documents
RL.3.51	Supplier Mitigation Plans Implemented (percent)	The percent of mitigation plans implemented for specific supplier or supplier base to mitigate risk.	sES.9: Manage Supply Chain Source Risk
RL.3.52	Supplier return order cycle time reestablished and sustained in 30 days	Supplier return order cycle time reestablished and sustained for increased quantities produced given 30 days, including supplier return order processing cycle time, pick-to-ship cycle, transit time, etc.	sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration
RL.3.53	Total # of Confirmed MRO Conditions/ Total # of MRO Service Requests Initiated	Total # of Confirmed MRO Conditions/ Total # of MRO Service Requests Initiated	sR2: Return MRO Product

Metric ID	Metric Name	Metric Definition	Process
RL.3.54	VAR of product/customer performance	Value at Risk - the sum of the probability of risk events times the monetary impact of the events for the specific product or customer. For example: the company's historical On Time Delivery performance to a customer, the Customer Satisfaction Level, customer on time payment performance, customer bankruptcy, customer mergers, etc. can be used to calculate VaR.	sEP.9: Manage Supply Chain Plan Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
RL.3.55	Warranty and Returns	Number of returns within the warranty period. Warranty is a commitment, either expressed or implied that a certain fact regarding the subject matter of a contract is presently true or will be true.	sM1.3: Produce and Test sM1.4: Package
RL.3.56	Warranty Costs	Warranty costs include materials, labor and problem diagnosis for product defects.	sM1.3: Produce and Test sM1.4: Package sM2.3: Produce and Test sM2.4: Package sM3.4: Produce and Test sM3.5: Package
RL.3.57	Waste Processing Errors	Number of errors in waste transactions as a percent of total waste transactions	sM1.7: Waste Disposal sM2.7: Waste Disposal sM3.8: Waste Disposal
RL.3.58	Yield	The ratio of usable output from a process to its input.	sM1.3: Produce and Test sM1.4: Package sM2.3: Produce and Test sM2.4: Package sM3.4: Produce and Test sM3.5: Package
RL.3.59	Yield Variability	The condition that occurs when the output of a process is not consistently repeatable either in quantity, quality, or combination of these.	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test

Order Fulfillment Cycle Time

The average actual cycle time consistently achieved to fulfill customer orders. For each individual order, this cycle time starts from the order receipt and ends with customer acceptance of the order.

Qualitative Relationship Description
None Identified
Quantitative Relationship (optional, if calculable)
Order Fulfillment Cycle Time \approx Source Cycle Time + Make Cycle Time + Deliver Cycle Time
Calculation
$[\text{Sum Actual Cycle Times For All Orders Delivered}] / [\text{Total Number Of Orders Delivered}]$
Data Collection
Data for the components that are used to drive the calculation of responsiveness are taken from the Source, Make and Deliver process elements.
Discussion

The order fulfillment cycle time as captured from the moment a customer places the order to the moment the order is fulfilled is considered to be a 'gross' cycle time. It represents all the time passed between these two events, regardless of whether this represented cycle time for the activities performed by the organization to fulfill the order (both value-add and non-value-add) or dwell time because the order was placed well in advance by the customer. As such, this gross order fulfillment cycle time does not truly reflect the responsiveness of the organization. Take for example an organization that needs six days to fulfill a certain customer order. If the customer places the order one day in advance, the gross order fulfillment cycle time will be seven days. If the customer places the order 3 months ahead (pre-ordering), the gross fulfillment cycle time will be 96 days. However, the fact that the customer pre-orders does not reduce the responsiveness of the organization. On the contrary, one can argue that it may increase the ability of the organization to meet that order as it allows the organization to plan ahead and fulfill the order in a more optimal way.

The responsiveness of the organization is determined by the cumulative cycle time for all activities that are required to fulfill the order, but should exclude any dwell time where no activity takes place.

Therefore the definition of Order Fulfillment Cycle Time consists of a 'gross' component and a 'net' component named Order Fulfillment Process Time, according to the following formula: Order Fulfillment Cycle Time = Order Fulfillment Process Time + Order Fulfillment Dwell Time. Note that dwell time will equal 0 for companies who do not utilize this metric, so Order Fulfillment Cycle Time will equal Order Fulfillment Process Time.

Order fulfillment dwell time is defined as 'any lead time during the order fulfillment process where no activity takes place, which is imposed by customer requirements'. Note that this dwell time is different from 'idle time' or 'non-value-add lead time', which is caused by inefficiencies in the organization's processes and therefore ultimately under responsibility of the organization. This kind of idle time should not be deducted from the gross order fulfillment cycle time.

RS.1.1

Discussion cont.

Dwell time is mostly associated with the ordering process, where a customer may place an order in advance to reserve capacity/materials etc, but where the actual steps in the order fulfillment process take place later on. It is also common in the delivery process where the organization may be in principle ready to ship the product/service, but is requested by the customer to wait (for example to follow a certain shipment schedule).

Note that for those organizations where dwell time does not play a role, the dwell time can be taken as zero days which results in the net order fulfillment cycle time to be equal to the gross order fulfillment cycle time.

For benchmarking purposes it is recommended to use the Order Fulfillment Process Time, as this is the cycle time reflecting most accurately the responsiveness of the organization. It will also ensure that those organizations in industries where dwell time is a factor can be benchmarked against organizations in industries where dwell time does not play a role.

The concept of dwell time applies not only to the level 1 metric, but also to all lower level metrics. This means that each lower level metric can have a gross component, consisting of the net component and dwell time. Because the lower level metrics are hierarchical (the cumulative sum of cycle times at level 2 or 3 should be equal to the cycle time at level 1.) The cumulative sum of dwell times at level 2 or 3 should total up to the dwell time at level 1.

Hierarchical Metric Structure

Level 1

RS.1.1 Order Fulfillment Cycle Time

Level 2

RS.2.1 Source Cycle Time

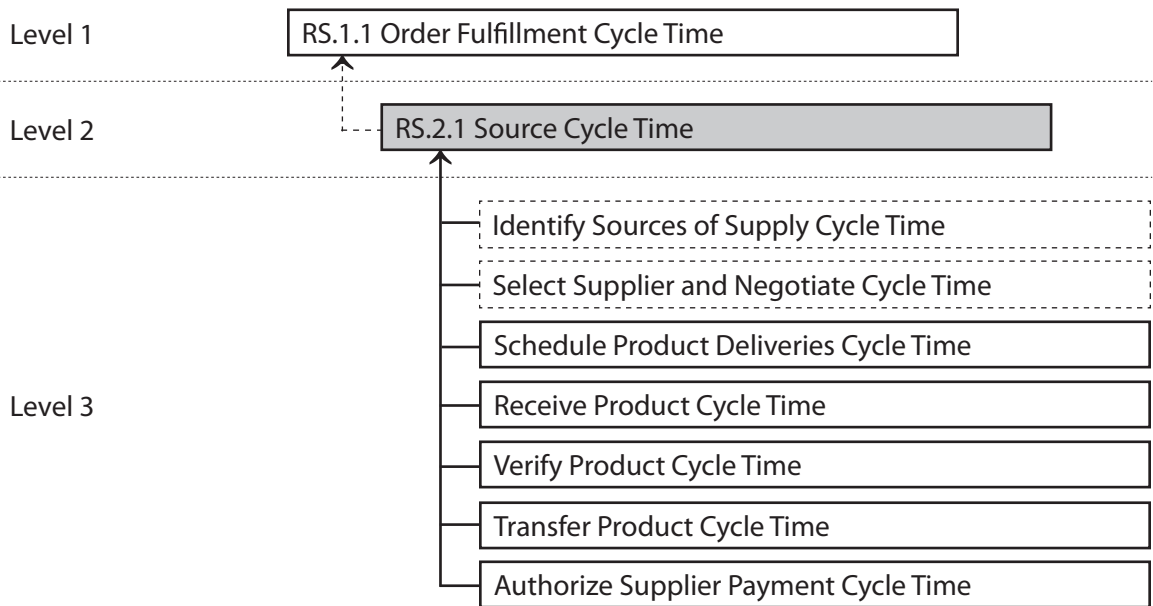
RS.2.2 Make Cycle time

RS.2.3 Deliver Cycle Time

Source Cycle Time

The average time associated with Source Processes. (Processes: sS1, sS2, sS3)

Qualitative Relationship Description
None Identified
Quantitative Relationship (optional, if calculable)
Source Cycle Time \approx (Identify Sources of Supply Cycle Time + Select Supplier and Negotiate Cycle Time) + Schedule Product Deliveries Cycle Time + Receive Product Cycle Time + Verify Product Cycle Time + Transfer Product Cycle Time + Authorize Supplier Payment Cycle Time
Calculation
None Identified
Data Collection
None Identified
Discussion
Metrics in Level 3 that are used to drive the calculation of 'Source Cycle time' are taken from the Source process elements, depending on the possible strategies deployed by companies to fulfill orders such as make-to-stock, make-to-order or engineer-to-order. When make-to-stock or make-to-order strategy is deployed, the dashed optional metrics 'Identify Sources of Supply Cycle Time' and 'Select Supplier and Negotiate Cycle Time' are not used in the calculation.
Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Make Cycle Time

The average time associated with Make Processes. (Processes: sM1,sM2, sM3)

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Make Cycle Time \approx (Finalize Production Engineering Cycle Time) + Schedule Production Activities Cycle Time + Issue Material/Product Cycle Time + Produce and Test Cycle Time + Package Cycle Time + Stage Finished Product Cycle Time + Release Finished Product To Deliver Cycle Time

Calculation

None Identified

Data Collection

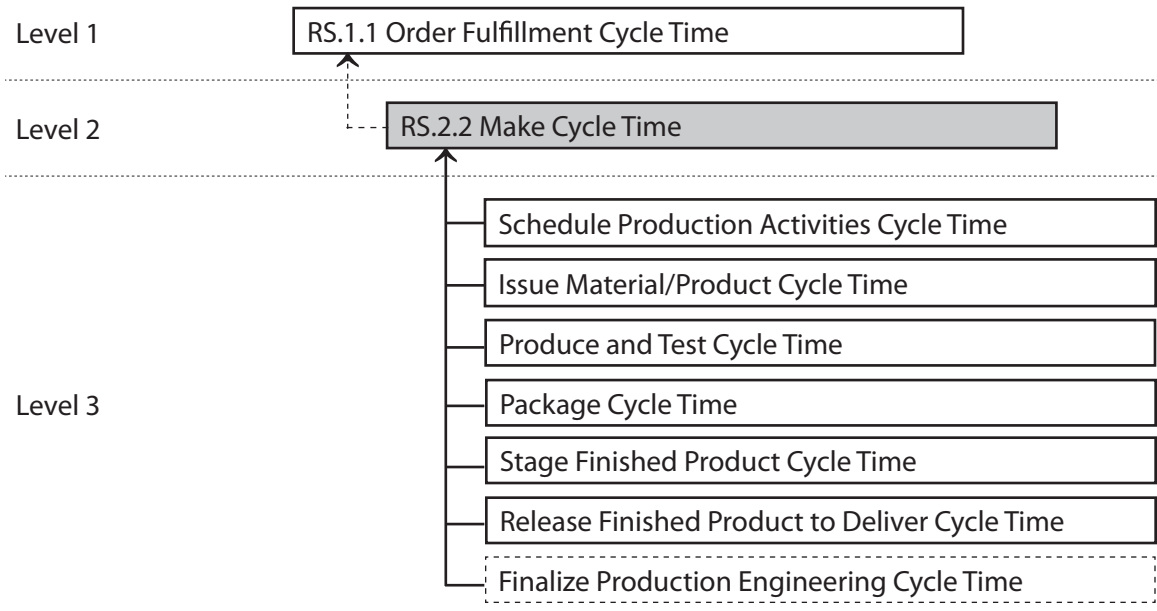
None Identified

Discussion

Metrics in Level 3 that are used to drive the calculation of 'Make Cycle time' are taken from the Make process elements, depending on the possible strategies deployed by companies to fulfill orders such as make-to-stock, make-to-order or engineer-to-order. When make-to-stock or make-to-order strategy is deployed, the dashed optional metric 'Finalize Production Engineering Cycle Time' is not used in the calculation. And also, the data for the calculation of Level 3 metrics may also depends on different make strategies, e.g., when make-to-stock strategy is deployed, the metric 'Issue Material/Product Cycle Time' means the time for issuing material; while when make-to-order or engineer-to-order is deployed, it will be a measure for calculating the cycle time for issuing sourced or in-process product.

In Make Cycle Time, there may be overlaps in the processes, so the "least amount of time" should be applied rather than the total sum.

Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Delivery Cycle Time

The average time associated with Deliver Processes. (Processes: sD1, sD2, sD3)

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Delivery Cycle Time \approx MAX {[Receive, Configure, Enter and Validate Order Cycle Time + Reserve Resources & Determine Delivery Date Cycle Time + (Consolidate Orders Cycle Time + Schedule Installation Cycle Time) + Build Loads Cycle Time + Route Shipments Cycle Time + Select Carriers and Rate Shipments Cycle Time], Receive Product from Make/Source Cycle Time} + Pick Product Cycle Time + Pack Product Cycle Time + Load Vehicle & Generate Shipping Documentation Cycle Time + Ship Product Cycle Time + (Receive & Verify Product Cycle Time) + (Install Product Cycle Time)

*The MAX function above is to indicate that sDx.3-sDx.7 may be in parallel with Dx.8 and whichever takes longer should determine the cycle time.

Calculation

None Identified

Data Collection

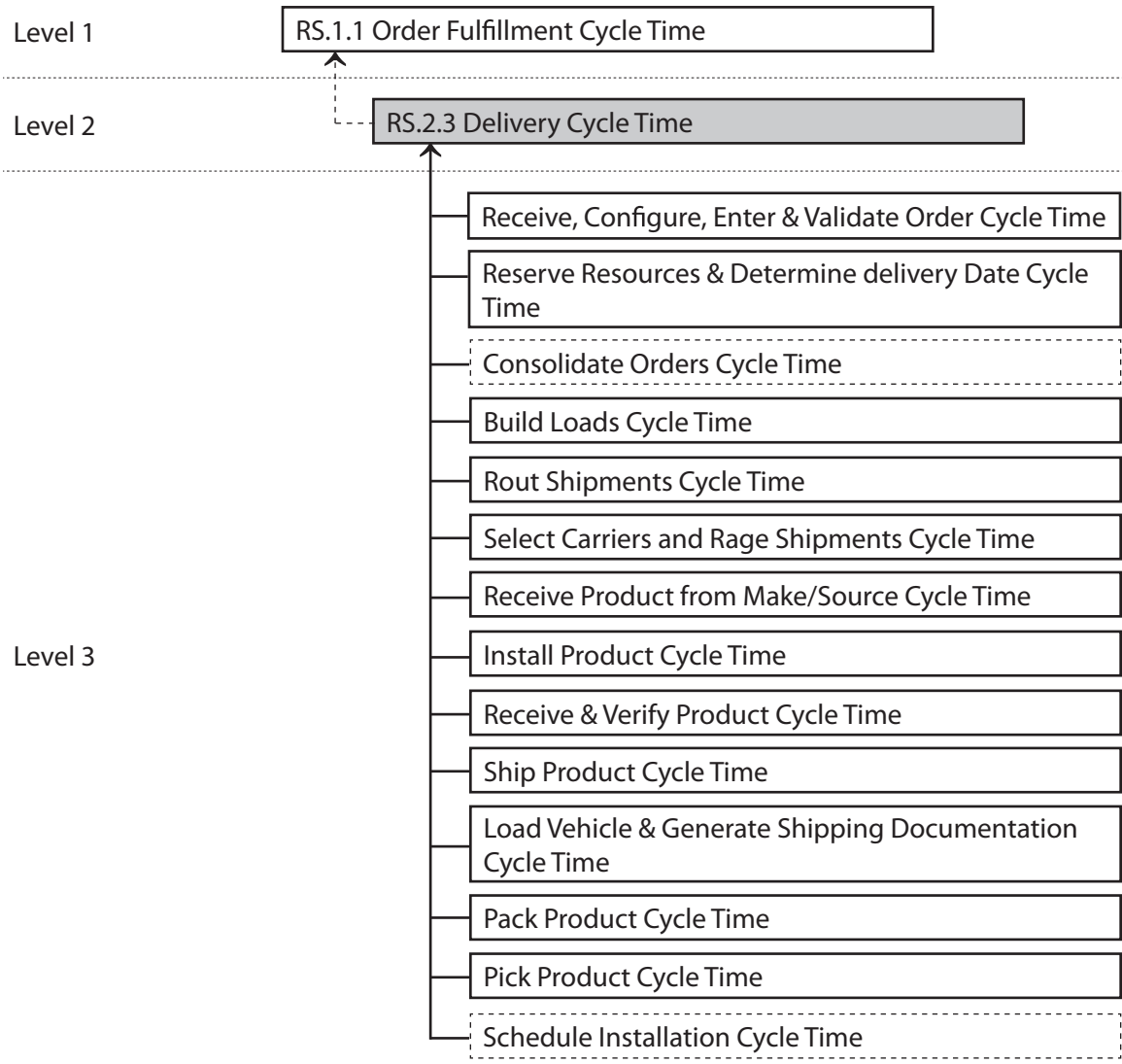
None Identified

Discussion

Metrics in Level 3 that are used to drive the calculation of 'Deliver Cycle time' are taken from the Deliver process elements, depending on the possible strategies deployed by companies to fulfill orders such as make-to-stock, make-to-order or engineer-to-order. When make-to-stock or make-to-order strategy is deployed, the optional metric 'Schedule Installation Cycle Time' is not used in the calculation, otherwise the metric 'Consolidate Orders Cycle Time' will not be used.

And also, the data for the calculation of Level 3 metrics may also depend on different make strategies, e.g., when make-to-stock strategy is deployed, the metric 'Receive, Configure, Enter and Validate Order Cycle Time' may not include the Configure process.

Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

RS.2.4

Delivery Retail Cycle Time

The average cycle time of the processes used to acquire, merchandise, and sell finished goods at a retail store. (Process: sD4)

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Delivery Retail Cycle Time \approx Generate Stocking Schedule Cycle Time + Receive Product Cycle Time + Pick Product Cycle Time + Stock Shelf Cycle Time + Fill Shopping Cart Cycle Time + Checkout Cycle Time + Install Cycle Time

Calculation

None Identified

Data Collection

None Identified

Discussion

None Identified

Hierarchical Metric Structure

Level 1

Level 2

RS.2.4 Delivery Retail Cycle Time

Level 3

Generate Stocking Schedule Cycle Time

Receive Product Cycle Time

Pick Product Cycle Time

Stock Shelf Cycle Time

Install Cycle Time

Checkout Cycle Time

Fill Shopping Cart Cycle Time

Level 3 Responsiveness Metrics

Metric ID	Metric Name	Metric Definition	Process
RS.3.1	Align Supply Chain Unit Plan with Financial Plan Cycle Time	The average time associated with aligning the supply chain unit plan with the financial plan	sEP.10: Align Supply Chain Unit Plan with Financial Plan
RS.3.2	Assess Delivery Performance Cycle Time	The average time associated with assessing the performance of deliver processes.	sED.2: Assess Delivery Performance
RS.3.3	Assess Supplier Performance Cycle Time	The average time associated with assessing the performance of supplier processes.	sES.2: Assess Supplier Performance
RS.3.4	Asset Turns	Total gross product revenue ÷ Total net assets	sM1.4: Package sM2.4: Package sM3.5: Package sM1.3: Produce and Test sM2.3: Produce and Test, sM3.4: Produce and Test
RS.3.5	Authorize Defective Product Return Cycle Time	The average time associated with authorizing the return of defective product.	sDR1.1: Authorize Defective Product Return
RS.3.6	Authorize Excess Product Return Cycle Time	The average time associated with authorizing the return of excess product.	sDR3.1: Authorize Excess Product Return
RS.3.7	Authorize MRO Product Return Cycle Time	The average time associated with authorizing the return of MRO product.	sDR2.1: Authorize MRO Product Return
RS.3.8	Authorize Supplier Payment Cycle Time	The average time associated with authorizing payment to suppliers.	sS1.5: Authorize Supplier Payment sS2.5: Authorize Supplier Payment sS3.7: Authorize Supplier Payment
RS.3.9	Average Days per Engineering Change	# of days each engineering change impacts the delivery date divided by the total # of changes.	sS1.1: Schedule Product Deliveries sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries
RS.3.10	Average Days per Schedule Change	# of days each schedule change impacts the delivery date divided by the total # of changes.	sS1.1: Schedule Product Deliveries sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries
RS.3.11	Average Release Cycle of Changes	Cycle time for implementing change notices divided by total number of changes.	sS1.1: Schedule Product Deliveries sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries
RS.3.12	Balance Product Resources with Product Requirements Cycle Time	The average time associated with balancing product resources and product requirements.	sP2.3: Balance Product Resources with Product Requirements

Metric ID	Metric Name	Metric Definition	Process
RS.3.13	Balance Production Resources with Production Requirements Cycle Time	The average time associated with the identifying, prioritizing, and aggregating product requirements.	sP3.3: Balance Production Resources with Production Requirements
RS.3.14	Balance Return Resources with Return Requirements Cycle Time	The average time associated with balancing return resources and return requirements.	sP5.3: Balance Return Resources with Return Requirements P5.2: Identify, Assess, and Aggregate Return Resources
RS.3.15	Balance Supply Chain Resources with Supply Chain Requirements Cycle Time	The average time associated with balancing supply chain resources and supply chain requirements.	sP1.3: Balance Supply Chain Resources with SC Requirements
RS.3.16	Build Loads Cycle Time	The average time associated with building shipment loads.	sD1.5: Build Loads sD2.5: Build Loads sD3.5: Build Loads
RS.3.17	Checkout Cycle Time	The average time required for customer checkout.	sD4.6: Checkout
RS.3.18	Consolidate Orders Cycle Time	The average time required for customer order consolidation.	sD1.4: Consolidate Orders sD2.4: Consolidate Orders
RS.3.19	Current customer return order cycle time	Current return order cycle time, including customer return order processing cycle time, transit time, return processing and disposition cycle time, etc.	sDR1: Deliver Return Defective Product, sDR2: Deliver Return MRO Product, sDR3: Deliver Return Excess Product
RS.3.20	Current logistics order cycle time	Current logistics order cycle time, including customer order processing cycle time, dock-to-stock cycle time, pick-to-ship cycle, transit time, etc.	sD1: Deliver Stocked Product, D2: Deliver Make-to-Order Product, sD3: Deliver Engineer-to-Order Product
RS.3.21	Current manufacturing order cycle time	Current manufacturing cycle time	sM1: Make-to-Stock, sM2: Make-to-Order, sM3: Engineer-to-Order
RS.3.22	Current supplier return order cycle time	Current supplier return order cycle time, including supplier return order processing cycle time, pick-to-ship cycle time, transit time etc.	sSR1: Source Return Defective Product sSR3: Source Return Excess Product
RS.3.23	Customs Clearance Cycle Time	The average time associated with clearing an order through customs	sED.8: Manage Import/Export Requirements sES.8: Manage Import/Export Requirements
RS.3.24	Deliver and/or Install Cycle Time	The average time required to deliver and install product.	sD4.7: Deliver and/or Install

Metric ID	Metric Name	Metric Definition	Process
RS.3.25	Enter Order, Commit Resources & Launch Program Cycle Time	The average time associated with entering an order, committing resources and program launch	sD3.3: Enter Order, Commit Resources Launch Program
RS.3.26	Establish and Communicate Return Plans Cycle Time	The average time associated with establishing and communicating return plans	sP5.4: Establish and Communicate Return Plans
RS.3.27	Establish Delivery Plans Cycle Time	The average time associated with establishing and communicating deliver plans	sP4.4: Establish Delivery Plans
RS.3.28	Establish Production Plans Cycle Time	The average time associated with establishing and communicating production plans	sP3.4: Establish Production Plans
RS.3.29	Establish Sourcing Plans Cycle Time	The average time associated with establishing and communicating source plans	sP2.4: Establish Sourcing Plans
RS.3.30	Establish Supply Chain Plans Cycle Time	Five point annual average of the sum of all gross inventories (raw materials & WIP, plant FG, field FG, field samples, other) ÷ (COGS ÷ 365). Total gross value of inventory at standard cost before reserves for excess and obsolescence. Only includes inventory on company books, future liabilities should not be included.	sP1.4: Establish & Communicate Supply-Chain Plans
RS.3.31	External Event Response (average days)	The average response time (in days) to an external risk event from the time of the event (included detection lags)	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
RS.3.32	Fill Shopping Cart Cycle Time	The average time associated with "filling the shopping cart"	sD4.5: Fill Shopping Cart
RS.3.33	Finalize Production Engineering Cycle Time	The average time associated with the finalization of production engineering	sM3.1: Finalize Production Engineering
RS.3.34	Generate Stocking Schedule Cycle Time	The average time associated with the generating a stocking schedule	sD4.1: Generate Stocking Schedule

Metric ID	Metric Name	Metric Definition	Process
RS.3.35	Identify Sources of Supply Cycle Time	The average time associated with the identification of sources of supply	sS3.1: Identify Sources of Supply
RS.3.36	Identify, Assess and Aggregate Production Resources Cycle Time	The average time associated with the identifying, prioritizing, and aggregating product requirements.	sP3.2: Identify, Assess and Aggregate Production Resources
RS.3.37	Identify, Assess, and Aggregate Delivery Resources Cycle Time	The average time associated with the identifying, assessing, and aggregating delivery resource availability	sP4.2: Identify, Assess and Aggregate Delivery Resources sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements
RS.3.38	Identify, Assess, and Aggregate Product Resources Cycle Time	The average time associated with the identifying, assessing, and aggregating product resource availability	sP3.2: Identify, Assess and Aggregate Production Resources sP2.2: Identify, Assess and Aggregate Product Resources
RS.3.39	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time	The average time associated with the identifying, assessing, and aggregating supply chain resource availability	sP1.2: Identify, Prioritize and Aggregate SC Resources
RS.3.40	Identify, Prioritize, and Aggregate Delivery Requirements Cycle Time	The average time associated with the identifying, prioritizing, and aggregating delivery requirements	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
RS.3.41	Identify, Prioritize, and Aggregate Product Requirements Cycle Time	The average time associated with the identifying, prioritizing, and aggregating product requirements	sP2.1: Identify, Prioritize and Aggregate Product Requirements
RS.3.42	Identify, Prioritize, and Aggregate Production Requirements Cycle Time	The average time associated with the identifying, prioritizing, and aggregating production requirements	sP3.1: Identify, Prioritize and Aggregate Production Requirements
RS.3.43	Identify, Prioritize, and Aggregate Return Requirements Cycle Time	The average time associated with the identifying, prioritizing, and aggregating return requirements	sP5.1: Assess and Aggregate Return Requirements

Metric ID	Metric Name	Metric Definition	Process
RS.3.44	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time	The average time associated with the identifying, prioritizing, and aggregating supply chain requirements	sP1.1: Identify, Prioritize and Aggregate SC Requirements
RS.3.46	Install Product Cycle Time	The average time associated with product installation	sD1.14: Install Product sD2.14: Install Product sD3.14: Install Product
RS.3.47	In-stock %	Percentage of materials, components, or finished goods that are there when needed.	sD4.4: Stock Shelf
RS.3.48	Invoice Cycle Time	The average time associated with the generation and issuance of an invoice	sD1.15: Invoice sD3.15: Invoice
RS.3.49	Issue Material Cycle Time	The average time associated with the issuance of material to production	sM1.2: Issue Material
RS.3.50	Issue Sourced/In-Process Product Cycle Time	The average time associated with the issuance of material to production	sM2.2: Issue Sourced/In-Process Product sM3.3: Issue Sourced/In-Process Product
RS.3.51	Load Product & Generate Shipping Documentation Cycle Time	The average time associated with product loading and the generation of shipping documentation	sD1.11: Load Vehicle & Generate Shipping Documentation sD2.11: Load Product & Generate Shipping Documentation sD3.11: Load Product & Generate Shipping Documents
RS.3.53	Maintain Source Data Cycle Time	The average time associated with maintaining source data	sES.3: Maintain Source Data
RS.3.54	Manage Business Rules for PLAN Processes Cycle Time	The average time associated with managing plan business rules	sEP.1: Manage Business Rules for Plan Processes
RS.3.55	Manage Business Rules for Return Processes Cycle Time	The average time associated with managing rules for returns	sER.1: Manage Business Rules for Return Processes
RS.3.56	Manage Capital Assets Cycle Time	The average time associated with managing capital assets	sES.5: Manage Capital Assets
RS.3.57	Manage Deliver Business Rules Cycle Time	The average time associated with managing deliver business rules	sED.1: Manage Deliver Business Rules

Metric ID	Metric Name	Metric Definition	Process
RS.3.58	Manage Deliver Capital Assets Cycle Time	The average time associated with managing deliver capital assets	sED.5: Manage Deliver Capital Assets
RS.3.59	Manage Deliver Information Cycle Time	The average time associated with managing deliver information	sED.3: Manage Deliver Information
RS.3.60	Manage Finished Goods Inventories Cycle Time	The average time associated with managing finished good inventory	sED.4: Manage Finished Goods Inventories
RS.3.61	Manage Import/Export Requirements Cycle Time	The average time associated with managing import/export requirements	sED.8: Manage Import/Export Requirements sES.8: Manage Import/Export Requirements
RS.3.62	Manage Incoming Product Cycle Time	The average time associated with managing inbound raw material	sES.6: Manage Incoming Product
RS.3.63	Manage In-Process Products (WIP) Cycle Time	The average time associated with managing WIP inventory	sEM.4: Manage In-Process Products (WIP)
RS.3.64	Manage Integrated Supply Chain Capital Assets Cycle Time	The average time associated with managing integrated supply chain capital assets	sEP.5: Manage Integrated Supply Chain Capital Assets
RS.3.65	Manage Integrated Supply Chain Inventory Cycle Time	The average time associated with managing integrated supply chain inventory	sEP.4: Manage Integrated Supply Chain Inventory
RS.3.66	Manage Integrated Supply Chain Transportation Cycle Time	The average time associated with managing integrated supply chain transportation	sEP.6: Manage Integrated Supply Chain Transportation
RS.3.67	Manage MAKE Equipment and Facilities Cycle Time	The average time associated with managing production equipment and facilities	sEM.5: Manage Make Equipment and Facilities
RS.3.68	Manage MAKE Information Cycle Time	The average time associated with managing production information	sEM.3: Manage Make Information
RS.3.69	Manage MAKE Regulatory Compliance Cycle Time	The average time associated with managing compliance to the make regulatory environment	sEM.8: Manage Make Regulatory Environment

Metric ID	Metric Name	Metric Definition	Process
RS.3.70	Manage Performance of Return Processes Cycle Time	The average time associated with managing the performance of supply chain activities	sER.2: Manage Performance of Return Processes
RS.3.71	Manage Performance of Supply Chain Cycle Time	The average time associated with managing the performance of return activities	sEP.2: Manage Performance of Supply Chain
RS.3.72	Manage PLAN Data Collection Cycle Time	The average time associated with collecting plan data	sEP.3: Manage Plan Data Collection
RS.3.73	Manage Plan Regulatory Requirements and Compliance Cycle Time	The average time associated with managing the planning of regulatory requirements and compliance	sEP.8: Manage Plan Regulatory Requirements and Compliance
RS.3.74	Manage Planning Configuration Cycle Time	The average time associated with managing the planning of the supply chain configuration	sEP.7: Manage Planning Configuration
RS.3.75	Manage Product Inventory Cycle Time	The average time associated with managing raw material inventory	sES.4: Manage Product Inventory
RS.3.76	Manage Product Life Cycle Time	The average time associated with managing the product life cycle	sED.7: Manage Product Life Cycle
RS.3.77	Manage Production Network Cycle Time	The average time associated with managing the production network	sEM.7: Manage Production Network
RS.3.78	Manage Production Performance Cycle Time	The average time associated with managing production performance	sEM.2: Manage Production Performance
RS.3.79	Manage Production Rules Cycle Time	The average time associated with managing production rules	sEM.1: Manage Production Rules
RS.3.80	Manage Return Capital Assets Cycle Time	The average time associated with managing return capital assets	sEM.5: Manage Return CapitalAssets
RS.3.81	Manage Return Data Collection Cycle Time	The average time associated with managing return data collection	sER.3: Manage Return Data Collection
RS.3.82	Manage Return Inventory Cycle Time	The average time associated with managing return inventory	sER.4: Manage Return Inventory

Metric ID	Metric Name	Metric Definition	Process
RS.3.83	Manage Return Network Configuration Cycle Time	The average time associated with managing the return network configuration	sER.7: Manage Return Network Configuration
RS.3.84	Manage Return Regulatory Requirements and Compliance Cycle Time	The average time associated with compliance and regulatory requirements for return products	sER.7: Manage Return Network Configuration
RS.3.85	Manage Return Transportation Cycle Time	The average time associated with managing return transportation	sER.6: Manage Return Transportation
RS.3.86	Manage Sourcing Business Rules Cycle Time	The average time associated with managing source business rules	sES.1: Manage Sourcing Business Rules
RS.3.87	Manage Supplier Agreements Cycle Time	The average time associated with managing supplier agreements	sES.10: Manage Supplier Agreements
RS.3.88	Manage Supplier Network Cycle Time	The average time associated with managing the supplier network	sES.7: Manage Supplier Network
RS.3.89	Manage Transportation (WIP) Cycle Time	The average time associated with managing (WIP) transportation	sEM.6: Manage Transportation (WIP)
RS.3.90	Manage Transportation Cycle Time	The average time associated with managing transportation	sED.6: Manage Transportation
RS.3.91	Manufacturing cycle time reestablished and sustained for 30 days	The average time associated with managing transportation	sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network
RS.3.92	Negotiate & Receive Contract Cycle Time	The average time associated with negotiating and receiving a contract	sD3.2: Negotiate and Receive Contract
RS.3.93	Obtain & Respond to Request for Quote (RFQ) / Request for Proposal (RFP) Cycle Time	The average time associated with obtaining and responding to RFQs/RFPs	sD3.1: Obtain and Respond to RFP/ RFQ

Metric ID	Metric Name	Metric Definition	Process
RS.3.94	Order Fulfillment Dwell Time	Any lead time during the order fulfillment process where no activity takes place, which is imposed by customer requirements. Note that this dwell time is different from 'idle time' or 'non-value-add lead time', which is caused by inefficiencies in the organization's processes and therefore ultimately under responsibility of the organization. This kind of idle time should not be deducted from Order Fulfillment Cycle Time.	sD1.2: Receive, Enter and Validate Order sD1.3: Reserve Inventory and Determine Delivery Date sD2.2: Receive, Configure, Enter and Validate Order sD2.3: Reserve Inventory and Determine Delivery Date sD3.3: Enter Order, Commit Resources Launch Program
RS.3.95	Pack Product Cycle Time	The average time associated with packing a product for shipment.	sD1.10: Pack Product sD2.10: Pack Product sD3.10: Pack Product
RS.3.96	Pick Product Cycle Time	The average time associated with product pick	sD1.9: Pick Product sD2.9: Pick Product sD3.9: Pick Product
RS.3.97	Pick Product from Backroom Cycle Time	The average time associated with product pick from backroom	sD4.3: Pick Product from Backroom
RS.3.98	Plan Cycle Time	The average time associated with Plan Processes	sP1: Plan Supply Chain
RS.3.99	Plan Source Cycle Time	The average time associated with planning source activities	sP2: Plan Source
RS.3.100	Process Inquiry & Quote Cycle Time	The average time associated with processing inquiries and quotes	sD1.1: Process Inquiry and Quote sD2.1: Process Inquiry and Quote
RS.3.101	Produce and Test Cycle Time	The average time associated with production and test	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test
RS.3.102	Receive & Verify Product by Customer Cycle Time	The average time associated with receiving and verifying an order at the customer site	sD1.13: Receive and Verify Product by Customer sD2.13: Receive and Verify Product by Customer sD3.13: Receive and Verify Product by Customer
RS.3.104	Receive Defective Product Cycle Time	The average time associated with receiving defective product returns from the customer	sDR1.3: Receive Defective Product

Metric ID	Metric Name	Metric Definition	Process
RS.3.105	Receive Excess Product Cycle Time	The average time associated with receiving excess product returns from the customer	sDR3.3: Receive Excess Product
RS.3.106	Receive MRO Product Cycle Time	The average time associated with receiving MRO product returns from the customer	sDR2.3: Receive MRO Product
RS.3.107	Receive Product Cycle Time	The average time associated with receiving product	sD4.2: Receive Product at the Store
RS.3.108	Receive Product from Make/Source Cycle Time	The average time associated with receiving product from Make/Source	sD1.8: Receive Product from Source or Make sD2.8: Receive Product from Source or Make sD3.8: Receive Product from Source or Make
RS.3.109	Receive Product at Store Cycle Time	The average time associated with receiving product at the customer store	sD4.2: Receive Product at the Store
RS.3.110	Receive Product from Source or Make Cycle Time	The average time associated with receiving a transfer of product to deliver processes from source or make	sD1.8: Receive Product from Source or Make sD2.8: Receive Product from Source or Make sD3.8: Receive Product from Source or Make
RS.3.111	Receive, Configure, Enter & Validate Order Cycle Time	The average time associated with receiving and verifying an order at the customer site	sD2.2: Receive, Configure, Enter and Validate Order
RS.3.112	Receive, Enter & Validate Order Cycle Time	The average time associated with receiving and verifying an order at the customer site	sD1.2: Receive, Enter and Validate Order
RS.3.113	Receiving Product Cycle Time	Total elapsed time from time product is received to time it is passed to next process	sS1.2: Receive Product sS2.2: Receive Product sS3.4: Receive Product
RS.3.114	Release Finished Product to Deliver Cycle Time	The average time associated with releasing finished product to deliver	sM1.6: Release Product to Deliver sM2.6: Release Finished Product to Deliver sM3.7: Release Product to Deliver
RS.3.115	Reserve Inventory & Determine Delivery Date Cycle Time	The average time associated with reserving inventory and determining a delivery date	sD2.3: Reserve Inventory and Determine Delivery Date

Metric ID	Metric Name	Metric Definition	Process
RS.3.116	Reserve Resources and Determine Delivery Date Cycle Time	The average time associated with reserving resources and determining a delivery date	sD1.3: Reserve Inventory and Determine Delivery Date sD2.3: Reserve Inventory and Determine Delivery Date
RS.3.117	Route Shipments Cycle Time	The average time associated with routing shipments	sD1.6: Route Shipments sD2.6: Route Shipments sD3.6: Route Shipments
RS.3.118	Schedule Defective Return Receipt Cycle Time	The average time associated with scheduling the receipt of the return of defective product	sDR1.2: Schedule Defective Return Receipt
RS.3.119	Schedule Excess Return Receipt Cycle Time	The average time associated with scheduling the receipt of the return of excess product	sDR3.2: Schedule Excess Return Receipt
RS.3.120	Schedule Installation Cycle Time	The average time associated with scheduling the installation of product	sD3.4: Schedule Installation
RS.3.121	Schedule MRO Return Receipt Cycle Time	The average time associated with scheduling the receipt of the return of MRO product	sDR2.2: Schedule MRO Return Receipt
RS.3.122	Schedule Product Deliveries Cycle Time	The average time associated with scheduling the shipment of the return of MRO product	sS1.1: Schedule Product Deliveries sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries
RS.3.123	Schedule Production Activities Cycle Time	The average time associated with scheduling production activities	sM1.1: Schedule Production Activities sM2.1: Schedule Production Activities sM3.2: Schedule Production Activities
RS.3.124	Select Carriers & Rate Shipments Cycle Time	The average time associated with selecting carriers and rating shipments	sD1.7: Select Carriers and Rate Shipments sD1.7: Select Carriers and Rate Shipments sD3.7: Select Carriers & Rate Shipments
RS.3.125	Select Supplier and Negotiate Cycle Time	The average time associated with selecting a supplier and negotiating	sS3.2: Select Final Supplier(s) and Negotiate
RS.3.126	Ship Product Cycle Time	The average time associated with shipping product	sD1.12: Ship Product sD2.12: Ship Product sD3.12: Ship Product
RS.3.127	Source Return Cycle Time	Average time associated with Sourcing Return	sSR1: Source Return Defective Product sSR3: Source Return Excess Product

Metric ID	Metric Name	Metric Definition	Process
RS.3.128	Stage Finished Product Cycle Time	The average time associated with staging finished product	sM1.5: Stage Product sM2.5: Stage Finished Product sM3.6: Stage Finished Product
RS.3.129	Stock Shelf Cycle Time	The average time associate with stocking shelves	sD4.4: Stock Shelf
RS.3.130	Supply chain down time due to compliance issues	Time the supply chain is disrupted by environmental compliance issues divided by the total potential available time	sEP.8: Manage Plan Regulatory Requirements and Compliance, sES.8: Manage Import/Export Requirements sEM.8: Manage Make Regulatory Environment sED.8: Manage Import/Export Requirements sER.8: Manage Return Regulatory Requirements and Compliance
RS.3.131	Time to reach and sustain current customer return order cycle time	Amount of time needed to reach and sustain current customer return order cycle time, including customer return order processing cycle time, transit time, return processing and disposition cycle time, etc.	sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration
RS.3.133	Time to reach and sustain current manufacturing order cycle time	Amount of time needed to reach and sustain current manufacturing cycle time	sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network
RS.3.134	Time to reach and sustain current purchase order cycle time	Amount of time needed to reach and sustain current procurement cycle time, including time to place a purchase order and supplier lead time	sES.5: Manage Source Capital Assets sES.6: Manage Incoming Product sES.7: Manage Supplier Network sES.10: Manage Supplier Agreements
RS.3.135	Time to reach and sustain current supplier return order cycle time	Amount of time needed to reach and sustain current supplier return order cycle time, including supplier return order processing cycle time, pick-to-ship cycle time, transit time, etc.	sES.5: Manage Source Capital Assets sES.6: Manage Incoming Product sES.7: Manage Supplier Network sES.10: Manage Supplier Agreements
RS.3.136	Transfer Defective Product Cycle Time	The average time associated transfer until product is moved to the next process.	sDR1.4: Transfer Defective Product

Metric ID	Metric Name	Metric Definition	Process
RS.3.137	Transfer Excess Product Cycle Time	The average time associated transfer until product is moved to the next process.	sDR3.4: Transfer Excess Product
RS.3.138	Transfer MRO Product Cycle Time	The average time associated transfer until product is moved to the next process.	sDR2.4: Transfer MRO Product
RS.3.139	Transfer Product Cycle Time	The average time associated transfer until product is moved to the next process.	sS1.4: Transfer Product sS2.4: Transfer Product sS3.6: Transfer Product
RS.3.140	Verify Product Cycle Time	The average time associated with verifying raw material product	sS1.3: Verify Product sS2.3: Verify Product sS3.5: Verify Product
RS.3.141	Waste accumulation time	The time required to collect and properly store production waste	sM1.7: Waste Disposal sM2.7: Waste Disposal sM3.8: Waste Disposal
RS.3.142	Package Cycle Time	The average time associated with Package	sM1.4: Package

Upside Supply Chain Flexibility

The number of days required to achieve an unplanned sustainable 20% increase in quantities delivered.

Note - 20% is a number provided for benchmarking purposes. For some industries and some organizations 20% may be in some cases unobtainable or in others too conservative. The new operating level needs to be achieved without a significant increase of cost per unit.

Component metrics (Upside Source Flexibility, Upside Make Flexibility, etc) can be improved in parallel and as a result, this calculation requires the result to be the least amount of time to achieve the desired result).

Qualitative Relationship Description

Calculation: Total elapsed days between the occurrence of the unplanned event and the achievement of sustained plan, source, make, deliver and return performance.

Note: Elapsed days are not necessarily the sum of days required for all activities as some may occur simultaneously.

AG.2.1 Upside Source Flexibility: The number of days required to achieve an unplanned sustainable 20% increase in quantity of raw materials.

AG.2.2 Upside Make Flexibility: The number of days required to achieve an unplanned sustainable 20% increase in production with the assumption of no raw material constraints.

AG.2.3 Upside Deliver Flexibility: The number of days required to achieve an unplanned sustainable 20% increase in quantity delivered with the assumption of no other constraints.

AG.2.4 Upside Source Return Flexibility: The number of days required to achieve an unplanned sustainable 20% increase in the return of raw materials to suppliers.

AG.2.5 Upside Deliver Return Flexibility: The number of days required to achieve an unplanned sustainable 20% increase in the return of finished goods from customers.

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

The calculation of supply chain flexibility requires the calculation to be the least time required to achieve the unplanned sustainable increase when considering Source, Make, and Deliver components.

For example, if it requires 90 days achieve a 20% increase in raw material volume, 60 days for adding capital to support production, and no time to increase the ability to deliver, upside supply chain flexibility would be 90 days (if production changes can run concurrently with material acquisition activities) or as much as 150 days if production changes and material acquisition changes must run sequentially.

AG.1.1

Data Collection

Data for the components that are used to drive the calculation of supply chain flexibility are taken from the actual planning activities incurred in devising the actions to be taken and the execution activities themselves. Neither the complete set of activities nor any given subset of those activities can be identified except in either contingency plans (in which case they are hypothetical), special analytical simulations conducted for the purpose of predicting total elapsed time, or after the fact (when they have actually occurred and are unlikely to reoccur in the same combination). Flexibility measures are assumption based or based on historic events.

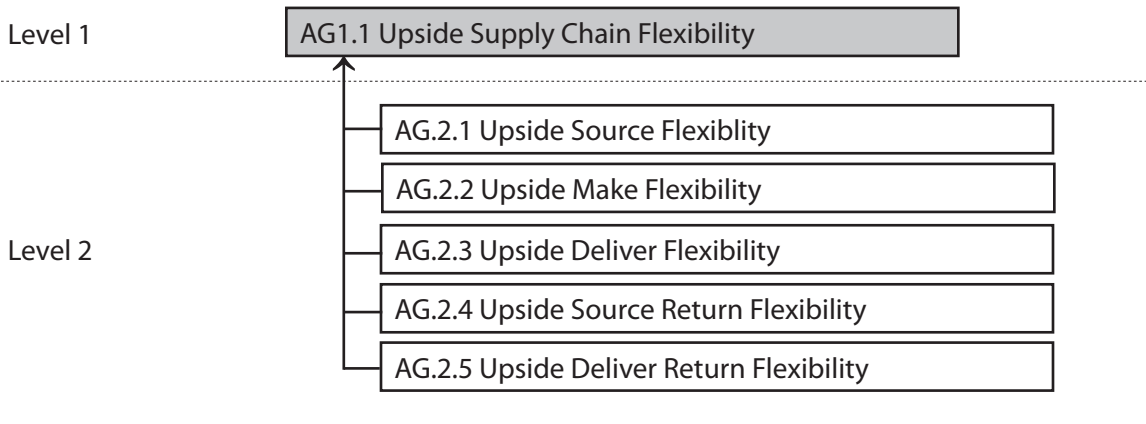
Discussion

Certainly enterprises deal with change all the time. In most cases, these changes are minor deviations from the “norm” or fleeting “blips” in the marketplace. Also, certainly, most supply chains move through these changes almost effortlessly and, in this regard, demonstrate equivalent flexibility. In many extreme cases, however, it is possible that a particular supply chain has reached a condition of relative rigidity (say, at capacity or rigid, constraining agreements with partners) and a seemingly minor increase in production requirement can consume much time and effort as the supply chain struggles to restore its capability to perform.

It is evidenced that enterprises engaged in appropriate business risk and competitive contingency planning activities will usually be in a better position to optimize overall supply chain performance and these activities are presented as best practices later in this document.

When change is known in advance (such as Wal-Mart requiring RFID devices on all delivered cases, or a major sourcing change is planned to occur), and is incorporated in the enterprise’s operating plan, then the time incurred to undertake the adaptation isn’t necessarily a reflection of the supply chain’s flexibility. While flexibility is still addressed, it is frequently clouded by other considerations in the operating plan. Unplanned change is the primary consideration in measuring the supply chain’s flexibility.

Hierarchical Metric Structure



Upside Supply Chain Adaptability

The maximum sustainable percentage increase in quantity delivered that can be achieved in 30 days.

Note: 30 days is an arbitrary number provided for benchmarking purposes. For some industries and some organizations 30 days may be in some cases unobtainable or in others too conservative.

Note: Component metrics (Upside Source Adaptability, Upside Make Adaptability, etc) can be improved in parallel and as a result, this calculation requires the result to be the least increase in quantity sustainable in 30 days. The new operating level needs to be achieved without a significant increase in cost per unit.

Qualitative Relationship Description

Note: The calculation of Supply Chain Adaptability requires the calculation to be the least quantity sustainable when considering Source, Make, Deliver and Return components.

AG.2.6 Upside Source Adaptability: The maximum sustainable percentage increase in raw material quantities that can be acquired/received in 30 days.

AG.2.7 Upside Make Adaptability: The maximum sustainable percentage increase in production that can be achieved in 30 days with the assumption of no raw material constraints.

AG.2.8 Upside Deliver Adaptability: The maximum sustainable percentage increase in quantities delivered that can be achieved in 30 days with the assumption of unconstrained finished good availability.

AG.2.9 Upside Source Return Adaptability: The maximum sustainable percentage increase in returns of raw materials to suppliers that can be achieved in 30 days with the assumption of unconstrained finished goods availability.

AG.2.10 Upside Deliver Return Adaptability: The maximum sustainable percentage increase in returns of finished goods from customers that can be achieved in 30 days.

Quantitative Relationship (optional, if calculable)

Upside Source Adaptability + Upside Make Adaptability + Upside Deliver Adaptability

Calculation

Supply chain adaptability is the least quantity sustainable when considering Source, Make, Deliver and Return components.

Data Collection

Adaptability measures are assumption based or based on historic events. Some elements can be measured and taken as a basis for further considerations. Adaptability measures are based on the actual number of returns compared to the maximum number of returns which can be achieved within 30 days. The weakest component determines the overall volume.

AG.1.2

Discussion

The calculation of Supply Chain Adaptability requires the calculation to be the least quantity sustainable when considering Source, Make, Deliver and Return components.

- P&L Impact
 - ↳ Revenue
 - ↳ COGS
 - ↳ SGA
- Balance Sheet Impact
 - ↳ Inventory

Hierarchical Metric Structure

Level 1

AG1.2 Upside Supply Chain Adaptability

Level 2

AG.2.6 Upside Source Adaptability

AG.2.7 Upside Make Adaptability

AG.2.8 Upside Deliver Adaptability

AG.2.9 Upside Source Return Adaptability

AG.2.10 Upside Deliver Return Adaptability

Downside Supply Chain Adaptability

The reduction in quantities ordered sustainable at 30 days prior to delivery with no inventory or cost penalties.

Note: 30 days is an arbitrary number provided for benchmarking purposes. For some industries and some organizations 30 days may be in some cases unobtainable or in others too conservative.

Qualitative Relationship Description

The calculation of downside supply chain adaptability requires the calculation to be based on the least reduction sustainable when considering Source, Make, and Deliver components.

AG.2.11 Downside Source Adaptability: The raw material quantity reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.

AG.2.12 Downside Make Adaptability: The production reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.

AG.2.13 Downside Deliver Adaptability: The reduction in delivered quantities sustainable at 30 days prior to delivery with no inventory or cost penalties.

Quantitative Relationship (optional, if calculable)

Downside Source Adaptability + Downside Make Adaptability + Downside Deliver Adaptability

Calculation

None Identified

Data Collection

Adaptability measures are assumption based on historic events. Some elements can be measured and taken as a basis for further considerations.

Discussion

The calculation of Supply Chain Adaptability requires the calculation to be the least quantity sustainable when considering Source, Make, Deliver and Return components.

- P&L Impact
 - ⇒ Revenue
 - ⇒ COGS
 - ⇒ SGA
- Balance Sheet Impact
 - ⇒ Inventory

AG.1.3

Hierarchical Metric Structure

Level 1

AG.1.3 Downside Supply Adaptability

Level 2

AG.2.11 Downside Source Adaptability

AG.2.12 Downside Make Adaptability

AG.2.13 Downside Deliver Adaptability

Supply Chain Value at Risk (VAR)

Value at Risk – the sum of the probability of risk events times the monetary impact of the events for all the supply chain functions (e.g. Plan, Source, Make, Deliver and Return). (Processes: sEP.9, sES.9, sEM.9, sED.9, sER.9).

Qualitative Relationship Description

Value at Risk – the sum of the probability of risk events times the monetary impact of the events for all the supply chain functions (e.g. Plan, Source, Make, Deliver and Return).

Quantitative Relationship (optional, if calculable)

Supply Chain Risk VAR (\$) = Sum of Supply Chain VAR \$ (Plan + Source + Make + Deliver + Return)

Calculation

Supply Chain Risk VAR (\$) = VAR \$ (Plan) + VAR \$ (Source) + VAR \$ (Make) + VAR \$ (Deliver) + VAR \$ (Return)

Data Collection

The VaR calculation uses historical data on the specific event (on time delivery, quality, disruptions, failures, etc) to calculate the number of times the event performed below the target (probability) times the amount below the target. For disruptions, VaR would use estimated frequency based upon expert resources times the impact of the event.

Discussion

VaR can be used in the supply chain to evaluate the different aspects of risk. Suppliers can be evaluated base upon the VaR of performance measures. Customers can also be measured based upon performance measures (profitability, volume growth, returns, and complaints) as well as products (warranty claims, etc.). VaR can also be applied to internal supply chain entities such as manufacturing, distribution or sales locations.

Since VaR can be monetarized by accessing the cost of performance below target, VaR can be rolled up and examined by any demographic or data cut (by region, by customer, by supplier, etc.). Suppliers can be evaluated based upon VaR and ranked according to the risk of poor performance.

Caveats in using VaR :

VaR calculates the probability of non-adherence to metrics value (expected value) based on historical data. Hence, it is a retrospective view of the event risk. The same may or may not be applicable in the future.

VaR is a downside Risk Metrics. It calculates maximum loss for each level of confidence (probability). In a real life scenario, it is likely that the losses would be less than calculated using VaR.

Calculating VaR from historical data requires a large database of events and metrics, and it could be computationally intensive.

AG.1.4

Hierarchical Metric Structure

Level 1

AG.1.4 Value At Risk (VAR \$, % of Sales)

Level 2

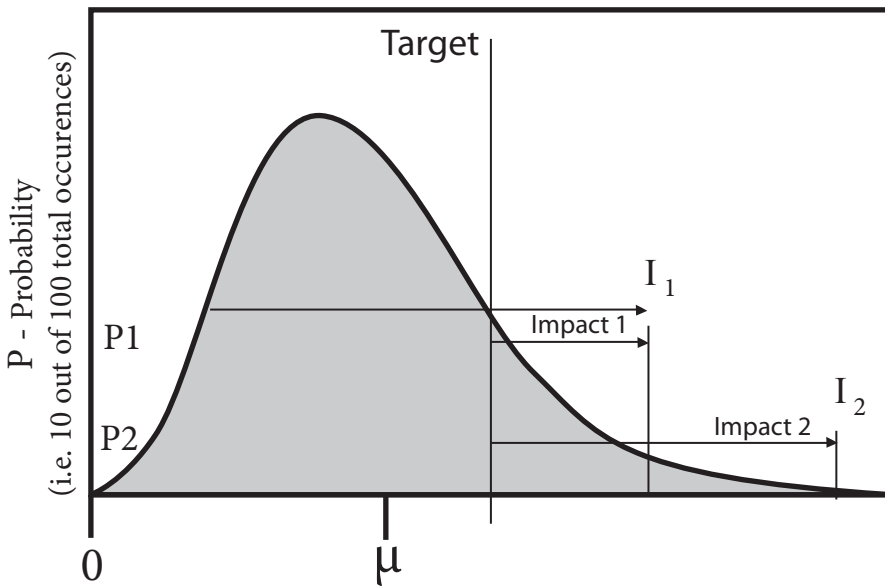
Value at Risk (VAR \$) (Plan)

Value at Risk (VAR \$) (Make)

Value at Risk (VAR \$) (Return)

Value at Risk (VAR \$) (Deliver)

Value at Risk (VAR \$) (Source)



Upside Source Flexibility

The number of days required to achieve an unplanned sustainable 20% increase in quantity of raw materials.

Note: This is a planning activity normally considering constraints to increase delivery that results in an estimate. Possible constraint factors are included in this section.

Qualitative Relationship Description

Least time to pursue all necessary activities.

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

None Identified

Data Collection

None Identified

Discussion

Source: Input

Current elements needed to fully understand future requirements, to establish 20% gap, based on the question "How long will it take for the company to sustain a 20% increase in quantities sourced?". These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current source volumes
 - ⇒ Amount of each item purchased

Staffing

- Staff needed to meet current demand
 - ⇒ Productivity-purchase orders per FTE
 - ⇒ Needed, but may be underutilized

Capital

- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures

Materials

- All else equal in make, deliver, return, current inventory on hand (raw material and purchased finished goods), including safety stock required to sustain current order fulfillment.
 - ⇒ Assuming optimized inventory practices (no excess inventory)
- Current sourcing/supplier constraints
 - ⇒ Current contract terms.
 - ⇒ Nature of items; commodity/sole source.

Discussion cont.

Cycle Time

- Current procurement cycle time
 - ⇒ Time to place a purchase order

Supplier lead time

Source: Resource Availability Assessment & Ramp-up/Lead Time

Elements needed to establish 20% delta in resources and what is required to meet the 20% delta based on the question "How long will it take for the company to sustain a 20% increase in quantities sourced?"

Demand

- Additional source volume

Staffing

- Staff availability in procurement (underutilized FTE's)
- Amount of time needed to recruit/hire/train additional staff to fill gap between underutilized FTE's and staff needed to sustain 20% increase in quantities delivered

Capital

- Current capital availability
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
- Amount of time needed to obtain capital to fill gap between current capital availability and capital needed to sustain 20% increase in quantities ordered

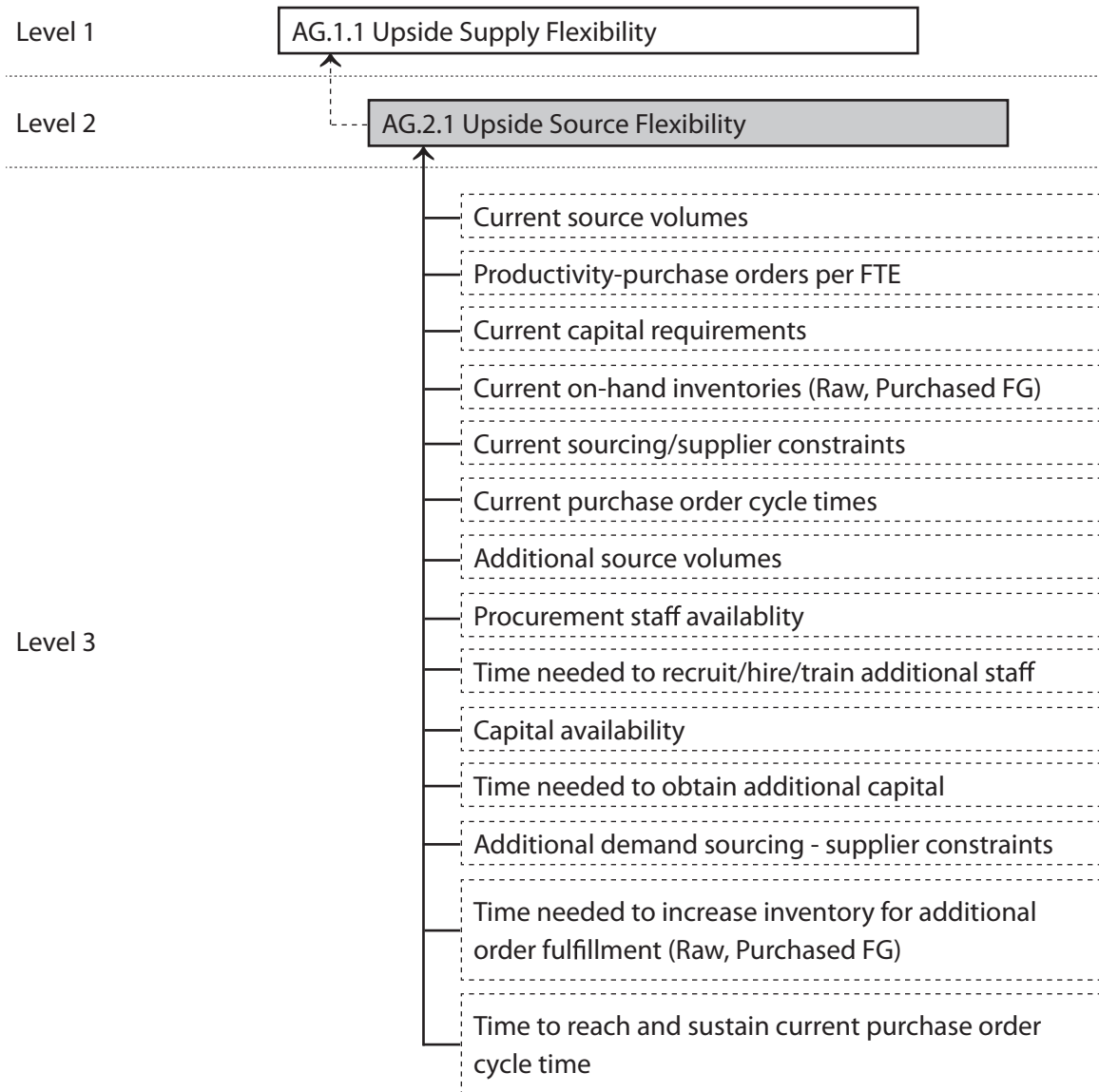
Materials

- Sourcing Constraints
 - ⇒ Time required in negotiating new source/volume contracts/terms
 - ⇒ Time required to find/obtain additional sources
- All else equal in make, deliver, return, amount of time needed to obtain, deliver and phase in inventory (raw material and purchased finished goods) for order fulfillment, including safety stock to sustain 20% increase in quantities sourced.

Cycle Time

- Amount of time needed to reach and sustain current procurement cycle time
 - ⇒ Time to place a purchase order
 - ⇒ Supplier lead time
-

Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Make Flexibility

The number of days required to achieve an unplanned sustainable 20% increase in production with the assumption of no raw material constraints.

Note: This is a planning activity normally considering constraints to increase delivery that results in an estimate.

Qualitative Relationship Description

Least time to pursue all necessary activities.

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

None Identified

Data Collection

None Identified

Discussion

Make: Input

Current elements needed to fully understand future requirements, to establish 20% gap, based on the question "How long will it take for the company to sustain a 20% increase in quantities produced?". These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current make volumes
 - ⇒ Amount of each item manufactured

Labor

- Labor needed to meet current demand
 - ⇒ Productivity-units/orders per FTE
 - ⇒ Needed, but may be underutilized

Capital/Assets

- Internal and External (outsourced) capacity needed for current demand throughput
 - ⇒ Facilities, space
 - ⇒ Manufacturing equipment, materials handling and packaging equipment, etc.
 - ⇒ *Needed, but may be underutilized*
- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, deliver and return, current inventory on hand (WIP and finished goods), including safety stock required to sustain current order fulfillment.

Discussion cont.

- ⇒ Assuming optimized inventory practices (no excess inventory)

Cycle Time

- Current manufacturing cycle time (all else equal including procurement order cycle time and supplier lead time)

Make: Resource Availability Assessment & Ramp-up/Lead Time

Elements needed to establish 20% delta in resources and what is required to meet the 20% delta based on the question “How long will it take for the company to sustain a 20% increase in quantities produced?”

Demand

- Additional make volume

Labor

- Direct labor availability and percent of labor used in manufacturing, not used in direct activity (underutilized FTE's)
- Amount of time needed to recruit/hire/train additional labor to fill gap between underutilized FTE's and labor needed to sustain 20% increase in quantities manufactured

Capital/Assets

- Current Internal Capacity utilization
 - ⇒ Facilities, space
 - ⇒ Manufacturing equipment, materials handling and packaging equipment, etc.
- Current capital availability
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)
- Amount of time needed to obtain capital to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities delivered
- Amount of time needed to obtain assets/capacity to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities delivered
 - ⇒ Facilities, space
 - ⇒ Manufacturing equipment, materials handling and packaging equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ⇒ Facilities, lease building, etc.
 - ⇒ Lease manufacturing equipment, materials handling and packaging equipment, etc.
 - ⇒ Co-packers
- Amount of time needed to obtain supplemental outsourced or leased resources or facilities to sustain 20% increase in quantities made

Materials

- All else equal in source, deliver and return, amount of time needed to receive and phase in raw material inventory for manufacturing and make WIP and FG inventory, including safety stock to sustain 20% increase in quantities manufactured)

Cycle Time

- Amount of time needed to reach and sustain current manufacturing cycle time (all else equal including procurement order cycle time and supplier lead time)

AG.2.2

Hierarchical Metric Structure

Level 1

AG.1.1 Upside Supply Flexibility

Level 2

AG.2.2 Upside Make Flexibility

Level 3



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Deliver Flexibility

The number of days required to achieve an unplanned sustainable 20% increase in quantity delivered with the assumption of no other constraints.

Note: This is a planning activity normally considering constraints to increase delivery that results in an estimate.

Qualitative Relationship Description

Least time to pursue all necessary activities.

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

None Identified

Data Collection

None Identified

Discussion

Deliver: Input

Current elements needed to fully understand future requirements, to establish 20% gap, based on the question "How long will it take for the company to sustain a 20% increase in quantities delivered?". These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current delivery volume
 - ⇒ Number of orders shipped

Labor

- Labor needed to meet current demand
 - ⇒ Productivity-orders per FTE
 - ⇒ Needed, but may be underutilized

Capital/Assets

- Internal and External (3PL) capacity needed for current demand throughput
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, outside carrier loads, materials handling equipment, etc.
 - ⇒ Needed, but may be underutilized

Current capital requirements

- Credit line
- Cash on hand
- Accounting procedures
- Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, make, return, current finished goods inventory on hand (including safety stock required to sustain current order fulfillment)

Discussion cont.

- ⇒ Assuming optimized inventory practices (no excess inventory)

Cycle Time

- Current logistics order cycle time (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
 - ⇒ Customer order processing cycle time (logistics only)
 - ⇒ Dock-to-stock cycle time
 - ⇒ Pick-to-ship cycle time
 - ⇒ Transit time

Deliver: Resource Availability Assessment & Ramp-up/Lead Time

Elements needed to establish 20% delta in resources and what is required to meet the 20% delta based on the question "How long will it take for the company to sustain a 20% increase in quantities delivered?"

Demand

- Additional delivery volume

Labor

- Direct labor availability and percent of labor used in logistics, not used in direct activity (underutilized FTE's)
- Amount of time needed to recruit/hire/train additional labor to fill gap between underutilized FTE's and labor needed to sustain 20% increase in quantities delivered

Capital/Assets

- Current Internal Capacity utilization
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.
- Current capital availability
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)
- Amount of time needed to obtain capital to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities delivered
- Amount of time needed to obtain assets/capacity to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities delivered
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ⇒ 3PL facilities, lease building, etc.
 - ⇒ Full service lease fleet, materials handling, etc. equipment
 - ⇒ Outside carriers
- Amount of time needed to obtain supplemental outsourced or leased resources or facilities to sustain 20% increase in quantities delivered

Materials

- All else equal in source, make, return, amount of time needed to increase finished inventory for order fulfillment (time to receive/stock inventory, including safety stock to sustain 20% increase in quantities delivered)

Discussion cont.

Cycle Time

- Amount of time needed to reach and sustain current logistics order cycle time (all esle equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
 - ⇒ Customer order processing cycle time (logistics only)
 - ⇒ Dock-to-stock cycle time
 - ⇒ Pick-to-ship cycle time
 - ⇒ Transit time
-

AG.2.3

Hierarchical Metric Structure

Level 1

AG.1.1 Upside Supply Flexibility

Level 2

AG.2.3 Upside Make Flexibility

Level 3



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Source Return Flexibility

The number of days required to achieve an unplanned sustainable 20% increase in the return of raw materials to suppliers.

Note: This is a planning activity normally considering constraints to increase delivery that results in an estimate.

Data Collection

None Identified

Discussion

Source Return: Input

Assuming no supplier constraints, current elements needed to fully understand future requirements, to establish 20% gap, based on the question "How long will it take for the company to sustain a 20% increase in quantities returned to suppliers?" These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- ⇒ Current return volume
- ⇒ Number of orders returned

Staff / Labor

- Procurement Staff / Logistics Labor needed to meet current returned volume
 - ⇒ Productivity-orders returned per FTE
 - ⇒ Needed, but may be underutilized

Capital/Assets

- Internal and External (3PL) capacity needed for current return throughput
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, outside carrier loads, materials handling equipment, etc.
 - ⇒ Needed, but may be underutilized
- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)

Cycle Time

- Current supplier return order cycle time
 - ⇒ Supplier return order processing cycle time (procurement and logistics)
 - ⇒ Pick-to-ship cycle time
 - ⇒ Transit time

Discussion cont.

Source Return: Resource Availability Assessment & Ramp-up/Lead Time

Assuming no supplier constraints, elements needed to establish 20% delta in resources and what is required to meet the 20% delta based on the question "How long will it take for the company to sustain a 20% increase in quantities returned to suppliers?"

Demand

- Additional supplier return volume

Staff / Labor

- Procurement staff / Logistics labor availability (underutilized FTE's)
- Amount of time needed to recruit/hire/train additional staff / labor to fill gap between underutilized FTE's and staff / labor needed to sustain 20% increase in quantities returned to suppliers

Capital/Assets

- Current Internal Capacity utilization
 - ↳ Facilities, space
 - ↳ Fleet equipment, materials handling equipment, etc.
- Current capital availability
 - ↳ Credit line
 - ↳ Cash on hand
 - ↳ Accounting procedures
 - ↳ Finance Procedures (outsource vs. in-source, lease vs. purchase)
- Amount of time needed to obtain capital to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities returned to suppliers
- Amount of time needed to obtain assets/capacity to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities returned to suppliers
 - ↳ Facilities, space
 - ↳ Fleet equipment, materials handling equipment, etc.

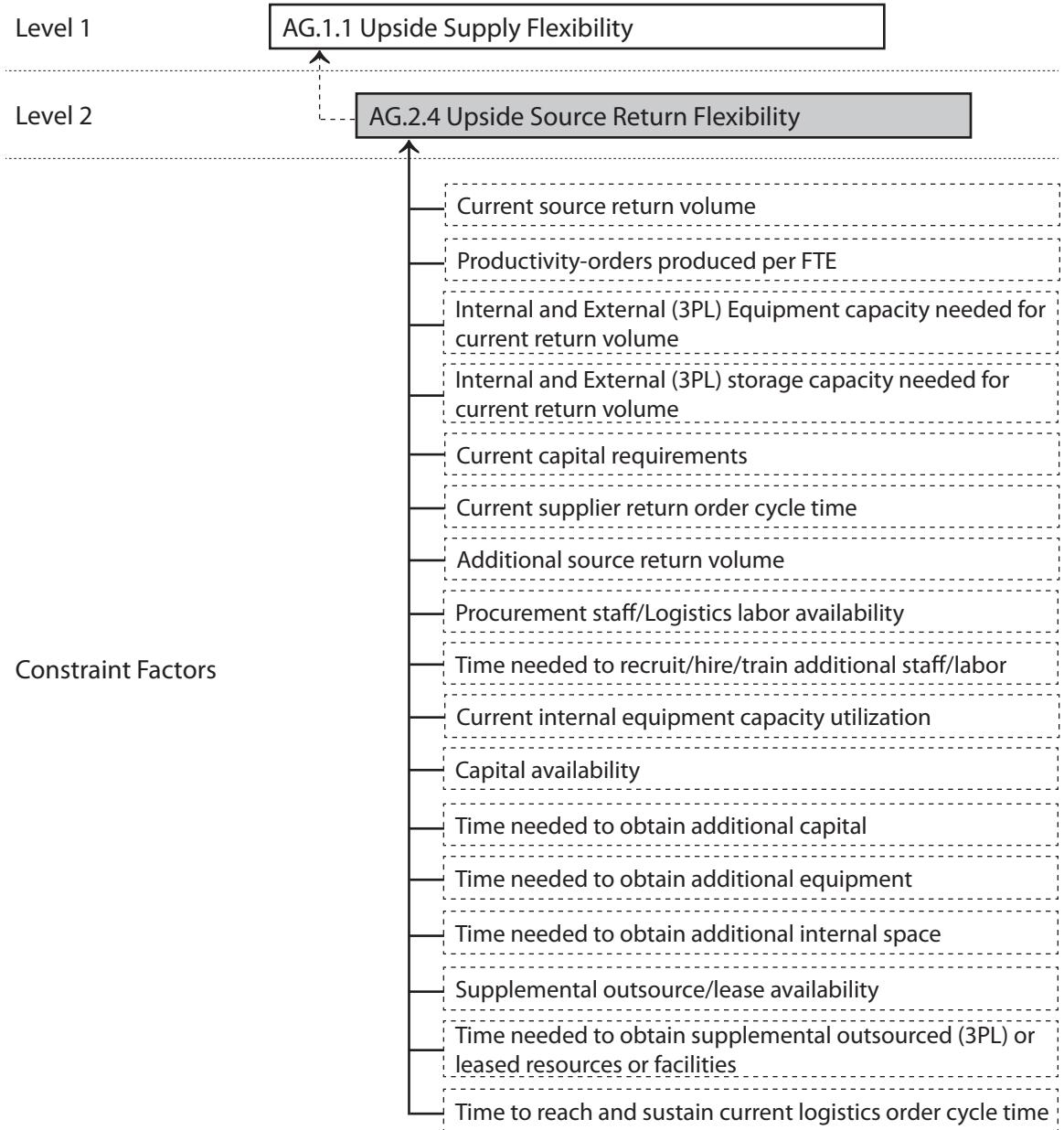
Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ↳ 3PL facilities, lease building, etc.
 - ↳ Full service lease fleet, materials handling, etc. equipment
 - ↳ Outside carriers
- Amount of time needed to obtain supplemental outsourced or leased resources or facilities to sustain 20% increase in quantities returned to suppliers

Cycle Time

- Amount of time needed to reach and sustain current supplier return order cycle time
 - ↳ Supplier return order processing cycle time (procurement and logistics)
 - ↳ Pick-to-ship cycle time
 - ↳ Transit time

Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Deliver Return Flexibility

The number of days required to achieve an unplanned sustainable 20% increase in the return of finished goods from customers.

Note: This is a planning activity normally considering constraints to increase delivery that results in an estimate.

Qualitative Relationship Description

Least time to pursue all necessary activities.

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

None Identified

Data Collection

None Identified

Discussion

Deliver Return: Input

Assuming no customer constraints, current elements needed to fully understand future requirements, to establish 20% gap, based on the question "How long will it take for the company to sustain a 20% increase in quantities returned from customers?" These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current return volume
 - ⇒ Number of orders returned

Staff / Labor

- Customer Service Staff / Logistics Labor needed to meet current returned volume
 - ⇒ Productivity-orders returned per FTE
 - ⇒ Needed, but may be underutilized

Capital/Assets

- Internal and External (3PL) capacity needed for current return throughput
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, outside carrier loads, materials handling equipment, etc.
 - ⇒ Needed, but may be underutilized
- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)

Cycle Time

- Current customer return order cycle time
 - ⇒ Customer return order processing cycle time (customer service and logistics)
 - ⇒ Transit time
 - ⇒ Return processing and disposition cycle time

Discussion cont.**Deliver Return: Resource Availability Assessment & Ramp-up/Lead Time**

Assuming no customer constraints, elements needed to establish 20% delta in resources and what is required to meet the 20% delta based on the question "How long will it take for the company to sustain a 20% increase in quantities returned to suppliers?"

Demand

- Additional customer return volume

Staff / Labor

- Customer Service staff / Logistics labor availability (underutilized FTE's)
- Amount of time needed to recruit/hire/train additional staff / labor to fill gap between underutilized FTE's and staff / labor needed to sustain 20% increase in quantities returned from customers

Capital/Assets

- Current Internal Capacity utilization
 - ↳ Facilities, space
 - ↳ Fleet equipment, materials handling equipment, etc.
- Current capital availability
 - ↳ Credit line
 - ↳ Cash on hand
 - ↳ Accounting procedures
 - ↳ Finance Procedures (outsource vs. in-source, lease vs. purchase)
- Amount of time needed to obtain capital to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities returned from customers
- Amount of time needed to obtain assets/capacity to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities returned from customers
 - ↳ Facilities, space
 - ↳ Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ↳ 3PL facilities, lease building, etc.
 - ↳ Full service lease fleet, materials handling, etc. equipment
 - ↳ Outside carriers
- Amount of time needed to obtain supplemental outsourced or leased resources or facilities to sustain 20% increase in quantities returned from customers

Cycle Time

- Amount of time needed to reach and sustain current customer return order cycle time
 - ↳ Customer return order processing cycle time (customer service and logistics)
 - ↳ Transit time
 - ↳ Return processing and disposition cycle time

AG.2.5

Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Source Adaptability

The maximum sustainable percentage increase in raw material quantities that can be acquired/received in 30 days.

Qualitative Relationship Description
Least quantity sustainable when considering all components
Quantitative Relationship (optional, if calculable)
None Identified
Calculation
None Identified
Data Collection
None Identified
Discussion

Source: Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question "How much of an increase in quantities sourced (expressed as a percentage) can the company sustain, given 30 days?" These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current source volumes
 - ⇒ Amount of each item purchased

Staffing

- Staff needed to meet current demand
 - ⇒ Productivity-purchase orders per FTE
 - ⇒ *Needed, but may be underutilized*

Capital

- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures

Materials

- All else equal in make, deliver, return, current inventory on hand (raw material and purchased finished goods), including safety stock required to sustain current order fulfillment.
 - ⇒ Assuming optimized inventory practices (*no excess inventory*)
- Current sourcing/supplier constraints
 - ⇒ Current contract terms.
 - ⇒ Nature of items; commodity/sole source.

Cycle Time

- Current procurement cycle time
 - ⇒ Time to place a purchase order
 - ⇒ Supplier lead time

Discussion cont.

Source: Resource Availability Assessment & Ramp-up/Lead Time

Elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question "How much of an increase in quantities sourced (expressed as a percentage) can the company sustain, given 30 days"

Demand

- Additional source volume to be determined given ramped up resources below

Staffing

- Staff availability in procurement (*underutilized FTE's*)
- How much staff can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities sourced given 30 days

Capital

- Current capital availability
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
- How much capital can be obtained to increase quantities sourced given 30 days

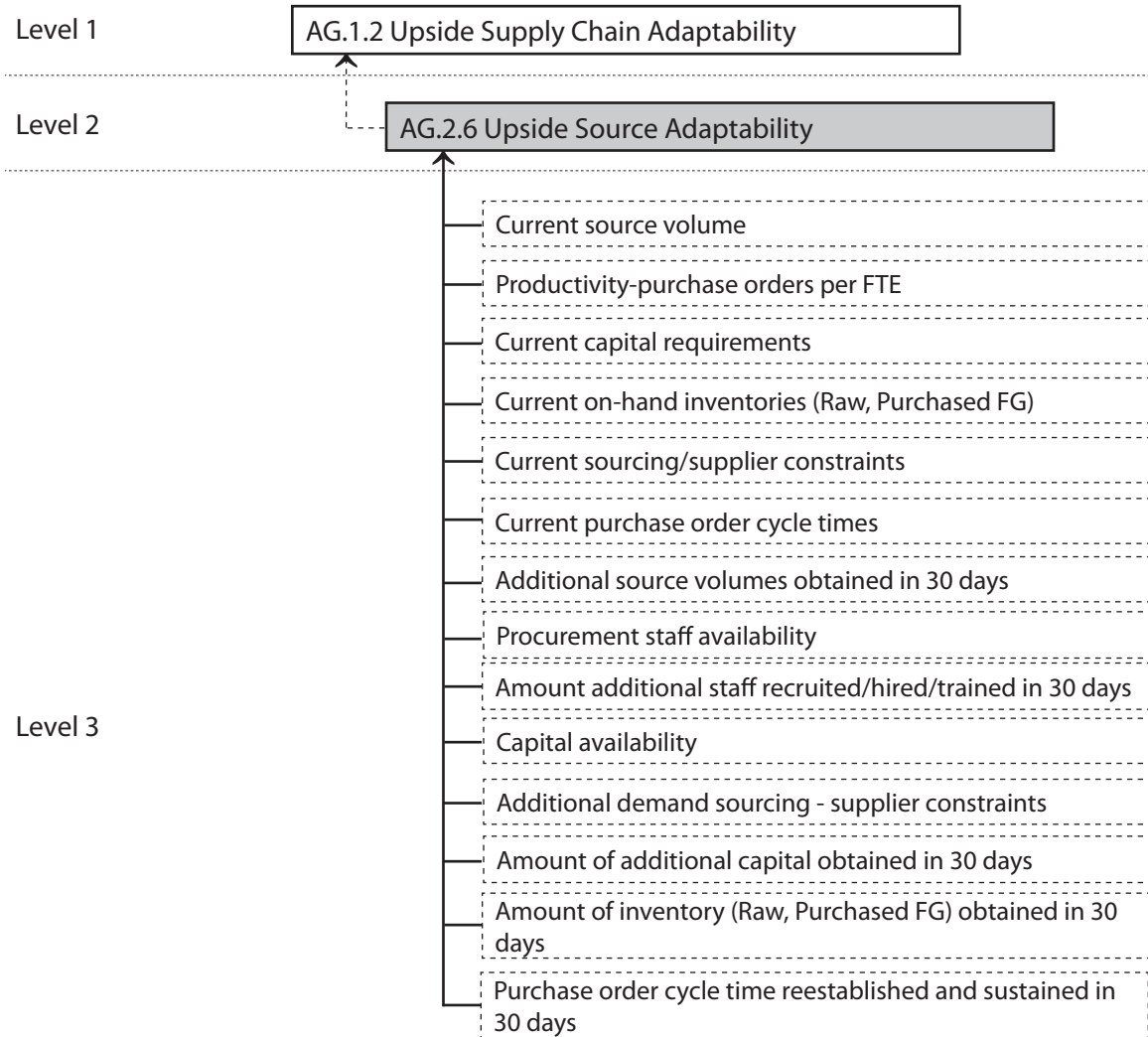
Materials

- Sourcing Constraints
 - ⇒ Time required in negotiating new source/volume contracts/terms
 - ⇒ Time required to find/obtain additional sources
- All else equal in make, deliver, return, how much inventory (raw material and purchased finished goods) can be obtained, delivered and phased in and sustained for order fulfillment, including safety stock given 30 days.

Cycle Time

- Procurement order cycle time reestablished and sustained for increased quantities sourced given 30 days.
 - ⇒ Time to place a purchase order
 - ⇒ Supplier lead time

Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Make Adaptability

The maximum sustainable percentage increase in production that can be achieved in 30 days with the assumption of no raw material constraints.

Qualitative Relationship Description
Least quantity sustainable when considering all components
Quantitative Relationship (optional, if calculable)
None Identified
Calculation
None Identified
Data Collection
None Identified
Discussion

Make: Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question “How much of an increase in quantities produced (expressed as a percentage) can the company sustain, given 30 days?” These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current make volumes
 - ⇒ Amount of each item manufactured

Labor

- Labor needed to meet current demand
 - ⇒ Productivity-units/orders per FTE
 - ⇒ *Needed, but may be underutilized*

Capital/Assets

- Internal and External (outsourced) capacity needed for current demand throughput
 - ⇒ Facilities, space
 - ⇒ Manufacturing equipment, materials handling and packaging equipment, etc.
 - ⇒ *Needed, but may be underutilized*
- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, deliver and return, current inventory on hand (WIP and finished goods), including safety stock required to sustain current order fulfillment.
 - ⇒ Assuming optimized inventory practices (*no excess inventory*)

Cycle Time

- Current manufacturing cycle time (all else equal including procurement order cycle time and supplier lead time)

Discussion cont.**Make: Resource Availability Assessment & Ramp-up/Lead Time**

Elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question “How much of an increase in quantities produced (expressed as a percentage) can the company sustain, given 30 days”

Demand

- Additional make volume to be determined given increased resources below

Labor

- Direct labor availability and percent of labor used in manufacturing, not used in direct activity (*underutilized FTE's*)
- How much labor can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities produced given 30 days

Capital/Assets

- Current Internal Capacity utilization
 - ↳ Facilities, space
 - ↳ Manufacturing equipment, materials handling and packaging equipment, etc.
- Current capital availability
 - ↳ Credit line
 - ↳ Cash on hand
 - ↳ Accounting procedures
 - ↳ Finance Procedures (outsource vs. in-source, lease vs. purchase)
- How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities produced given 30 days
- How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities produced given 30 days
 - ↳ Facilities, space
 - ↳ Manufacturing equipment, materials handling and packaging equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ↳ Facilities, lease building, etc.
 - ↳ Lease manufacturing equipment, materials handling and packaging equipment, etc.
 - ↳ Co-packers
- How much supplemental outsourced or leased resources or facilities can be obtained to increase and sustain quantities produced given 30 days

Materials

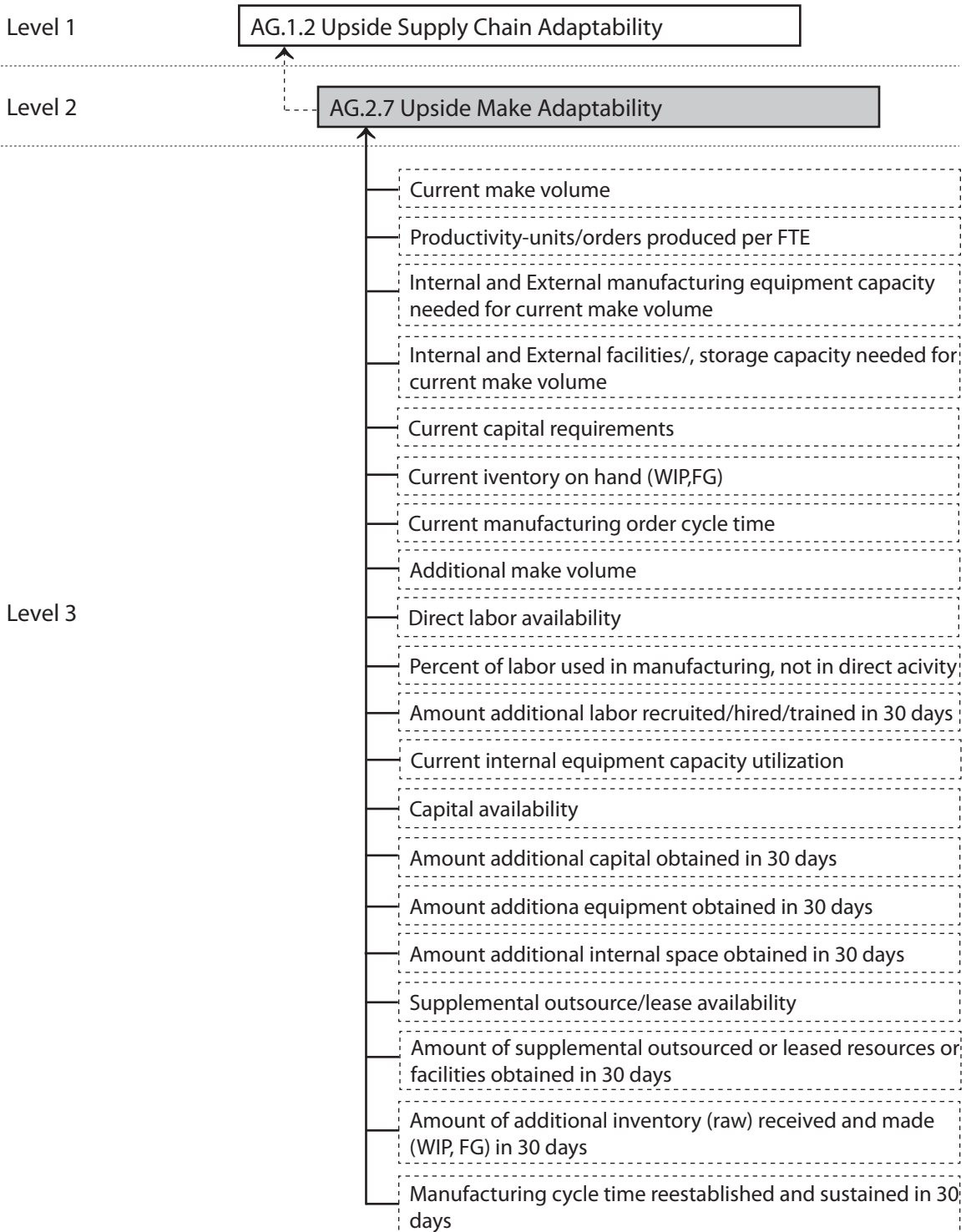
- All else equal in source, deliver and return, how much raw material inventory can be received and phased into manufacturing and produced into WIP and FG inventory, and sustained for order fulfillment, including safety stock given 30days.

Cycle Time

- Manufacturing cycle time reestablished and sustained for increased quantities produced given 30 days.

AG.2.7

Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Deliver Adaptability

The maximum sustainable percentage increase in quantities delivered that can be achieved in 30 days with the assumption of unconstrained finished good availability.

Qualitative Relationship Description
Least quantity sustainable when considering all components
Quantitative Relationship (optional, if calculable)
None Identified
Calculation
None Identified
Data Collection
None Identified
Discussion

Deliver: Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question “How much of an increase in quantities delivered (expressed as a percentage) can the company sustain, given 30 days?” These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current delivery volume
 - ⇒ Number of orders shipped

Labor

- Labor needed to meet current demand
 - ⇒ Productivity-orders per FTE
 - ⇒ *Needed, but may be underutilized*

Capital/Assets

- Internal and External (3PL) capacity needed for current demand throughput
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, outside carrier loads, materials handling equipment, etc.
 - ⇒ *Needed, but may be underutilized*
- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, make, return, current finished goods inventory on hand (including safety stock required to sustain current order fulfillment)
 - ⇒ Assuming optimized inventory practices (*no excess inventory*)

Discussion cont.

Cycle Time

- Current logistics order cycle time (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
 - ⇒ Customer order processing cycle time (logistics only)
 - ⇒ Dock-to-stock cycle time
 - ⇒ Pick-to-ship cycle time
 - ⇒ Transit time

Deliver: Resource Availability Assessment & Ramp-up/Lead Time

Elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question "How much of an increase in quantities delivered (expressed as a percentage) can the company sustain, given 30 days"

Demand

- Additional delivery volume to be determined given increased resources below

Labor

- Direct labor availability and percent of labor used in logistics, not used in direct activity (*underutilized FTE's*)
- How much labor can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities delivered given 30 days

Capital/Assets

- Current Internal Capacity utilization
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.
- Current capital availability
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)
- How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities delivered given 30 days
- How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities delivered given 30 days
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ⇒ 3PL facilities, lease building, etc.
 - ⇒ Full service lease fleet, materials handling, etc. equipment
 - ⇒ Outside carriers
- How much supplemental outsourced or leased resources or facilities can be obtained to increase and sustain quantities delivered given 30 days

Materials

- All else equal in source, make, return, amount of how much finished goods inventory can be received/stocked, including safety stock to sustain quantities delivered given 30 days

Discussion cont.**Cycle Time**

- Logistics cycle time reestablished and sustained for increased quantities delivered given 30 days (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
 - ⇒ Customer order processing cycle time (logistics only)
 - ⇒ Dock-to-stock cycle time
 - ⇒ Pick-to-ship cycle time
 - ⇒ Transit time
-

AG.2.8

Hierarchical Metric Structure

Level 1

AG.1.2 Upside Supply Chain Adaptability

Level 2

AG.2.8 Upside Deliver Adaptability

Level 3

- Current delivery volume
- Productivity-orders shipped per FTE
- Internal and External (3PL) equipment capacity needed for current delivery volume
- Internal and External (3PL) storage capacity needed for current delivery volume
- Current capital requirements
- Current inventory on hand (FG)
- Current logistics order cycle time
- Additional delivery volume
- Direct labor availability
- Percent of labor used in logistics, not in direct activity
- Amount labor recruited/hired/trained in 30 days
- Current internal equipment capacity utilization
- Current internal storage capacity utilization
- Capital availability
- Amount additional capital obtained in 30 days
- Amount additional equipment obtained in 30 days
- Amount additional internal space obtained in 30 days
- Supplemental outsource/lease availability
- Amount of supplemental outsourced or leased resources or facilities obtained in 30 days
- Amount of additional inventory (FG) obtained in 30 days
- Logistics order cycle time reestablished and sustained in 30 days

The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Source Return Adaptability

The maximum sustainable percentage increase in returns of raw materials to suppliers that can be achieved in 30 days.

Qualitative Relationship Description

The component which is the bottleneck determines the least volume for the increase of returns within 30 days. Least quantity sustainable when considering all components

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

None Identified

Data Collection

None Identified

Discussion

Source Return: Input

Assuming no supplier constraints, current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question “How much of an increase in quantities returned to suppliers (expressed as a percentage) can the company sustain, given 30 days?” These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current return volume
 - ⇒ Number of orders returned

Staff / Labor

- Procurement Staff / Logistics Labor needed to meet current returned volume
 - ⇒ Productivity-orders returned per FTE
 - ⇒ *Needed, but may be underutilized*

Capital/Assets

- Internal and External (3PL) capacity needed for current return throughput
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, outside carrier loads, materials handling equipment, etc.
 - ⇒ *Needed, but may be underutilized*
- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)

Cycle Time

- Current supplier return order cycle time
 - ⇒ Supplier return order processing cycle time (procurement and logistics)
 - ⇒ Pick-to-ship cycle time
 - ⇒ Transit time

Discussion cont.

Source Return: Resource Availability Assessment & Ramp-up/Lead Time

Assuming no supplier constraints, elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question "How much of an increase in quantities returned to suppliers (expressed as a percentage) can the company sustain, given 30 days"

Demand

- Additional supplier return volume to be determined given increased resources below

Staff / Labor

- Procurement staff / Logistics labor availability (*underutilized FTE's*)
- How much procurement staff/logistics labor can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities returned to suppliers given 30 days

Capital/Assets

- Current Internal Capacity utilization
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.
- Current capital availability
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)
- How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities returned to suppliers given 30 days
- How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities returned to suppliers given 30 days
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.

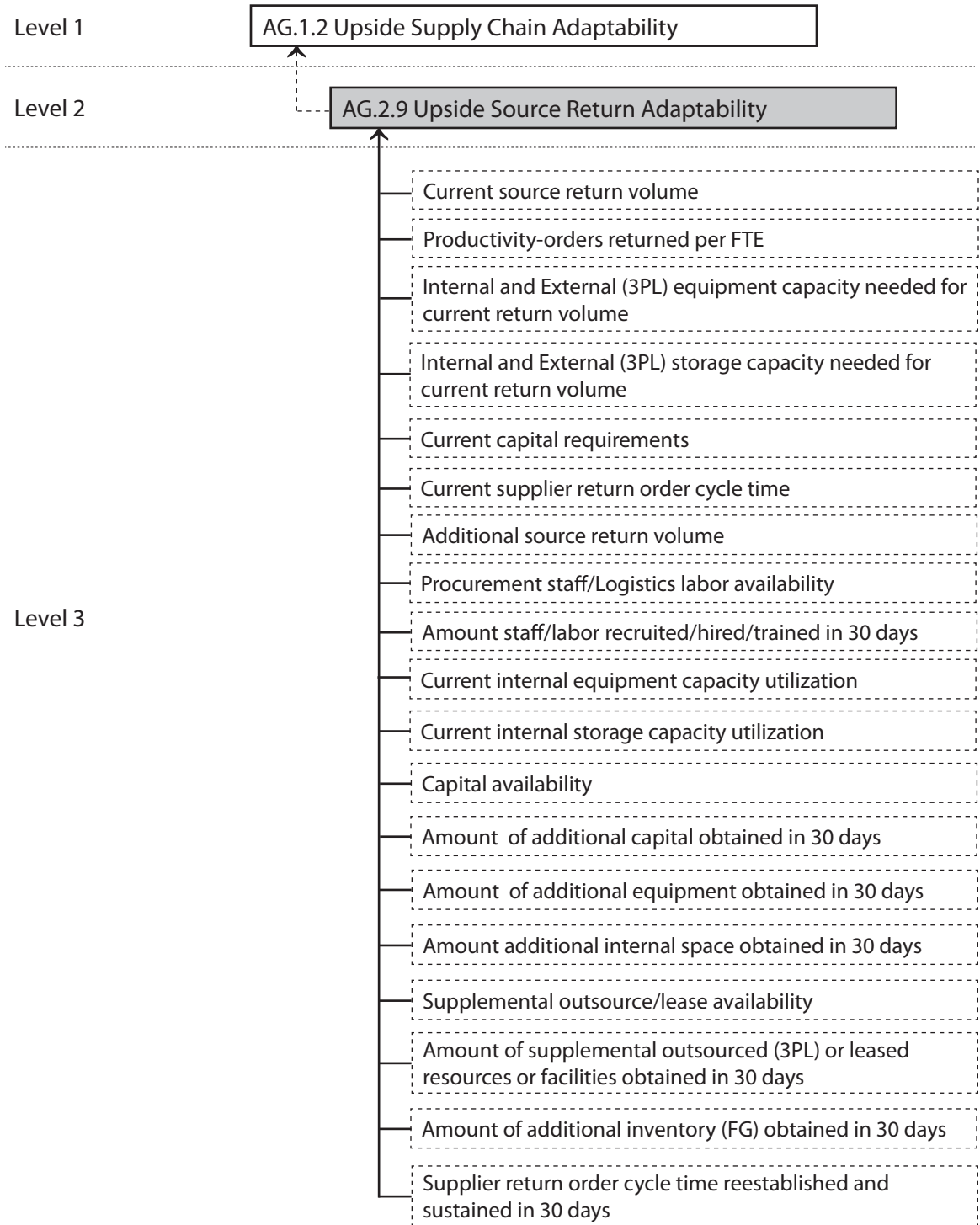
Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ⇒ 3PL facilities, lease building, etc.
 - ⇒ Full service lease fleet, materials handling, etc. equipment
 - ⇒ Outside carriers
- How much supplemental outsourced or leased resources or facilities can be obtained to increase and sustain quantities returned to suppliers given 30 days

Cycle Time

- Source return cycle time reestablished and sustained for increased quantities returned to suppliers given 30 days
 - ⇒ Supplier return order processing cycle time (procurement and logistics)
 - ⇒ Pick-to-ship cycle time
 - ⇒ Transit time
-

Hierarchical Metric Structure



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Upside Deliver Return Adaptability

The maximum sustainable percentage increase in returns of finished goods from customers that can be achieved in 30 days.

Qualitative Relationship Description

The component which is the bottleneck determines the least volume for the increase of returns within 30 days. Least quantity sustainable when considering all components

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

None Identified

Data Collection

None Identified

Discussion

Deliver Return: Input

Assuming no customer constraints, current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question “How much of an increase in quantities returned from customers (expressed as a percentage) can the company sustain, given 30 days?” These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current return volume
 - ⇒ Number of orders returned

Staff / Labor

- Customer Service Staff / Logistics Labor needed to meet current returned volume
 - ⇒ Productivity-orders returned per FTE
 - ⇒ *Needed, but may be underutilized*

Capital/Assets

- Internal and External (3PL) capacity needed for current return throughput
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, outside carrier loads, materials handling equipment, etc.
 - ⇒ *Needed, but may be underutilized*
- Current capital requirements
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)

Cycle Time

- Current customer return order cycle time
 - ⇒ Customer return order processing cycle time (customer service and logistics)
 - ⇒ Transit time
 - ⇒ Return processing and disposition cycle time

Discussion cont.**Deliver Return: Resource Availability Assessment & Ramp-up/Lead Time**

Assuming no customer constraints, elements needed to establish delta in resources and what can be ramped up and sustained within 30 days based on the question "How much of an increase in quantities returned from customers (expressed as a percentage) can the company sustain, given 30 days"

Demand:

- Additional customer return volume to be determined given increased resources below Staff / Labor
- Customer Service staff / Logistics labor availability (*underutilized FTE's*)
- How much customer service staff/logistics labor can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities returned from customers given 30 days

Capital/Assets

- Current Internal Capacity utilization
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.
- Current capital availability
 - ⇒ Credit line
 - ⇒ Cash on hand
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, lease vs. purchase)
- How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities returned from customers given 30 days
- How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities returned from customers given 30 days
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ⇒ 3PL facilities, lease building, etc.
 - ⇒ Full service lease fleet, materials handling, etc. equipment
 - ⇒ Outside carriers
- How much supplemental outsourced or leased resources or facilities can be obtained to increase and sustain quantities returned from customers given 30 days

Cycle Time

- Deliver return cycle time reestablished and sustained for increased quantities returned to suppliers given 30 days
- Customer return order processing cycle time (customer service and logistics)
 - ⇒ Transit time
 - ⇒ Return processing and disposition cycle time

AG.2.10

Hierarchical Metric Structure

Level 1

AG.1.2 Upside Supply Chain Adaptability

Level 2

AG.2.10 Upside Deliver Return Adaptability

Level 3

- Current deliver return volume
- Productivity-orders returned per FTE
- Internal and External (3PL) equipment capacity needed for current return volume
- Internal and External (3PL) storage capacity needed for current return volume
- Current capital requirements
- Current customer return order cycle time
- Additional deliver return volume
- Customer service staff/Logistics labor availability
- Amount staff/labor recruited/hired/trained in 30 days
- Current internal equipment capacity utilization
- Current internal storage capacity utilization
- Capital availability
- Amount of additional capital obtained in 30 days
- Amount of additional equipment obtained in 30 days
- Amount additional internal space obtained in 30 days
- Supplemental outsource/lease availability
- Amount of supplemental outsourced (3PL) or leased resources or facilities obtained in 30 days
- Amount of additional inventory (FG) obtained in 30 days
- Customer return order cycle time reestablished and sustained in 30 days

The dashed line boxes represent optional metrics associated with specific level 3 processes.

Downside Source Adaptability

The raw material quantity reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.

Qualitative Relationship Description
Least quantity reduction sustainable when considering all components
Quantitative Relationship (optional, if calculable)
None Identified
Calculation
None Identified
Data Collection
None Identified
Discussion
<p>Source: Input</p> <p>Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question “How much of a reduction in quantities sourced (expressed as a percentage) can the company sustain, given 30 days?” These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.</p> <p>Demand</p> <ul style="list-style-type: none"> ○ Current source volumes <ul style="list-style-type: none"> ⇒ Amount of each item purchased <p>Staffing</p> <ul style="list-style-type: none"> ○ Staff needed to meet current demand <ul style="list-style-type: none"> ⇒ Productivity-purchase orders per FTE ⇒ <i>Needed, but may be underutilized</i> <p>Capital</p> <ul style="list-style-type: none"> ○ Current capital requirements <ul style="list-style-type: none"> ⇒ Accounting procedures <p>Materials</p> <ul style="list-style-type: none"> ○ All else equal in make, deliver, return, current inventory on hand (raw material and purchased finished goods), including safety stock required to sustain current order fulfillment. <ul style="list-style-type: none"> ⇒ Assuming optimized inventory practices (<i>no excess inventory</i>) ○ Current sourcing/supplier constraints <ul style="list-style-type: none"> ⇒ Current contract terms. ⇒ Nature of items; commodity/sole source. <p>Cycle Time</p> <ul style="list-style-type: none"> ○ Current procurement cycle time <ul style="list-style-type: none"> ⇒ Time to place a purchase order ⇒ Supplier lead time

Discussion cont.

Source: Resource Availability Assessment & Ramp-down/Lead Time

Elements needed to establish delta in resources and what can be ramped down and sustained at 30 days prior to delivery based on the question "How much of a decrease in quantities sourced (expressed as a percentage) can the company sustain without inventory or cost penalties, given 30 days notice prior to delivery"

Demand

- Reduced source volume to be determined given ramped down resources below

Staffing

- Staff availability in procurement (*underutilized FTE's*)
- How much staff can be laid-off or diverted to other activities, without cost penalty, to ramp down to decreased quantities delivered given 30 days notice

Capital

- Current capital requirements
 - ⇒ Accounting procedures for selling/diverting/recycling assets

Materials

- Sourcing Constraints
 - ⇒ Time required in negotiating new source/volume contracts/terms
 - ⇒ Time required to ramp down supplier inventory
- How much inventory (raw material and purchased finished goods) can be returned, sold or diverted without cost penalty to ramp down to decreased quantities delivered given 30 days notice

Cycle Time

- Procurement order cycle time reestablished and sustained for decreased quantities sourced given 30 days.
 - ⇒ Time to place a purchase order
 - ⇒ Supplier lead time
-

Hierarchical Metric Structure

Level 1

AG.1.3 Downside Supply Adaptability

Level 2

AG.2.11 Downside Source Adaptability

Level 3

Current source volumes

Productivity-purchase orders per FTE

Current capital requirements

Current on-hand inventories (Raw, Purchased FG)

Current sourcing/supplier constraints

Current purchase order cycle times

Reduced source volumes accomplished in 30 days

Procurement staff availability

Amount of staff that can be laid-off in 30 days

Capital availability

Current capital requirements (accounting policy)

Demand sourcing - supplier constraints

Amount of decrease in inventory (Raw, Purchased FG) obtained in 30 days

Purchase order cycle time reestablished and sustained in 30 days

The dashed line boxes represent optional metrics associated with specific level 3 processes.

Downside Make Adaptability

The production reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.

Qualitative Relationship Description

Least quantity reduction sustainable when considering all components

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

None Identified

Data Collection

None Identified

Discussion

Make: Input

Current elements needed to fully understand future requirements, to establish the volume delta that can be sustained based on the question “How much of a reduction in quantities produced (expressed as a percentage) can the company sustain, given 30 days?” These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current make volumes
 - ⇒ Amount of each item manufactured

Labor

- Labor needed to meet current demand
 - ⇒ Productivity-units/orders per FTE
 - ⇒ *Needed, but may be underutilized*

Capital/Assets

- Internal and External (outsourced) capacity needed for current demand throughput
 - ⇒ Facilities, space
 - ⇒ Manufacturing equipment, materials handling and packaging equipment, etc.
 - ⇒ *Needed, but may be underutilized*
- Current capital requirements
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, deliver and return, current inventory on hand (WIP and finished goods), including safety stock required to sustain current order fulfillment.
 - ⇒ Assuming optimized inventory practices (*no excess inventory*)

Cycle Time

- Current manufacturing cycle time (all else equal including procurement order cycle time and supplier lead time)

Make: Resource Availability Assessment & Ramp-down/Lead Time

Elements needed to establish delta in resources and what can be ramped down and sustained at 30 days prior to delivery based on the question “How much of a decrease in quantities produced (expressed as a percentage) can the company sustain without inventory or cost penalties, given 30 days notice prior to delivery”

Demand

- Reduced make volume to be determined given ramped down resources below

Labor

- Direct labor availability and percent of labor used in manufacturing, not used in direct activity (*underutilized FTE's*)
- How much labor can be laid-off or diverted to other activities, without cost penalty, to ramp down to decreased quantities delivered given 30 days notice

Capital/Assets

- Current Internal Capacity utilization
 - ⇒ Facilities, space
 - ⇒ Manufacturing equipment, materials handling and packaging equipment, etc.
- Current capital requirements
 - ⇒ Accounting procedures for selling/diverting/recycling assets
 - ⇒ Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase) and their effect upon ability to terminate leases or sell capital equipment assets.
- How many capital equipment assets can be recycled, diverted or sold or subleased without cost penalty, to ramp down to decreased quantities delivered given 30 days notice
 - ⇒ Facilities, space
 - ⇒ Manufacturing equipment, materials handling and packaging equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ⇒ Facilities, lease building, etc.
 - ⇒ Lease manufacturing equipment, materials handling and packaging equipment, etc.
 - ⇒ Co-packers
- How much supplemental outsourced or leased resources or facilities can be terminated to ramp down to decreased quantities delivered given 30 days notice

Materials

- All else equal in source, deliver and return, how much manufacturing quantities (WIP and FG inventory), including safety stock can be ramped down to decreased order fulfillment quantities given 30 days notice.

Cycle Time

- Manufacturing cycle time reestablished and sustained for decreased quantities produced given 30 days.
-

Hierarchical Metric Structure

Level 1

AG.1.3 Downside Supply Chain Adaptability

Level 2

AG.2.12 Downside Make Adaptability

Level 3

Current make volumes

Productivity-units/orders produced per FTE

Internal and External manufacturing equipment capacity needed for current make volume

Internal and External facilities/, storage capacity needed for current make volume

Current capital requirements

Current inventory on hand (WIP, FG)

Current manufacturing order cycle time

Reduced make volume

Direct labor availability

Percent of labor used in manufacturing, not used in direct activity

Amount of labor that can be laid off in 30 days

Current internal equipment capacity utilization

Amount of equipment recycled, diverted or sold in 30 days

Capital Requirements (Acct./Finance Policy)

Amount of internal space subleased or sold in 30 days

Supplemental outsource/lease termination ability

Amount supplemental outsourced or leased resources or facilities terminated in 30 days

Amount reduced in inventory made (WIP, FG) in 30 days

Manufacturing cycle time reestablished and sustained in 30 days

The dashed line boxes represent optional metrics associated with specific level 3 processes.

Downside Deliver Adaptability

Downside Deliver Adaptability = The reduction in delivered quantities sustainable at 30 days prior to delivery with no inventory or cost penalties.

Qualitative Relationship Description

Least quantity reduction sustainable when considering all components

Quantitative Relationship (optional, if calculable)

None Identified

Calculation

None Identified

Data Collection

None Identified

Discussion

Deliver: Input Elements

Current elements needed to fully understand future requirements, to establish what can be ramped down and sustained at 30 days prior to delivery, based on the question "How much of a decrease in quantities delivered (expressed as a percentage) can the company sustain without inventory or cost penalties, given 30 days notice prior to delivery?" These elements are mainly output metrics from other attributes . . . responsiveness, reliability, cost, asset management.

Demand

- Current delivery volume
 - ⇒ Number of orders shipped

Labor

- Labor needed to meet current demand
 - ⇒ Productivity-orders per FTE
 - ⇒ *Needed, but may be underutilized*

Capital/Assets

- Internal and External (3PL) capacity needed for current demand throughput
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, outside carrier loads, materials handling equipment, etc.
 - ⇒ *Needed, but may be underutilized*
- Current capital requirements
 - ⇒ Accounting procedures
 - ⇒ Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase)

Materials

- All else equal in source, make, return, current finished goods inventory on hand (including safety stock required to sustain current order fulfillment)
 - Assuming optimized inventory practices (*no excess inventory*)

Discussion cont.

Cycle Time

- Current logistics order cycle time (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
 - ⇒ Customer order processing cycle time (logistics only)
 - ⇒ Dock-to-stock cycle time
 - ⇒ Pick-to-ship cycle time
 - ⇒ Transit time

Deliver: Availability Assessment & Ramp-down/Lead Time

Elements needed to establish delta in resources and what can be ramped down and sustained at 30 days prior to delivery based on the question "How much of a decrease in quantities delivered (expressed as a percentage) can the company sustain without inventory or cost penalties, given 30 days notice prior to delivery"

Demand:

- Reduced delivery volume to be determined given ramped down resources below

Labor

- Direct labor availability and percent of labor used in logistics, not used in direct activity (*underutilized FTE's*)
- How much labor can be laid-off or diverted to other activities, without cost penalty, to ramp down to decreased quantities delivered given 30 days notice

Capital/Assets

- Current Internal Capacity utilization
- Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.
- Current capital requirements
 - ⇒ Accounting procedures for selling/diverting/recycling assets
 - ⇒ Finance Procedures (outsource vs. in-source, make vs. buy, lease vs. purchase) and their effect upon ability to terminate leases or sell capital equipment assets.
- How many capital equipment assets can be recycled, diverted or sold without cost penalty, to ramp down to decreased quantities delivered given 30 days notice
 - ⇒ Facilities, space
 - ⇒ Fleet equipment, materials handling equipment, etc.

Outsourcing Alternatives to capital

- Supplemental Outsource/lease availability
 - ⇒ 3PL facilities, lease building, etc.
 - ⇒ Full service lease fleet, materials handling, etc. equipment
 - ⇒ Outside carriers
- How much supplemental outsourced or leased resources or facilities agreements can be terminated to ramp down to decreased quantities delivered given 30 days notice

Materials

- All else equal in source, make, return, how much inventory can be shipped or diverted without cost penalty to ramp down to decreased quantities delivered given 30 days notice (all else equal in source and make, includes safety stock)
 - ⇒ Transit time

Discussion cont.**Cycle Time**

- Logistics cycle time reestablished and sustained for decreased quantities delivered given 30 days (all else equal including procurement order cycle time, supplier lead time, manufacturing cycle time, etc.)
 - ↳ Customer order processing cycle time (logistics only)
 - ↳ Dock-to-stock cycle time
 - ↳ Pick-to-ship cycle time
-

AG.2.13

Hierarchical Metric Structure

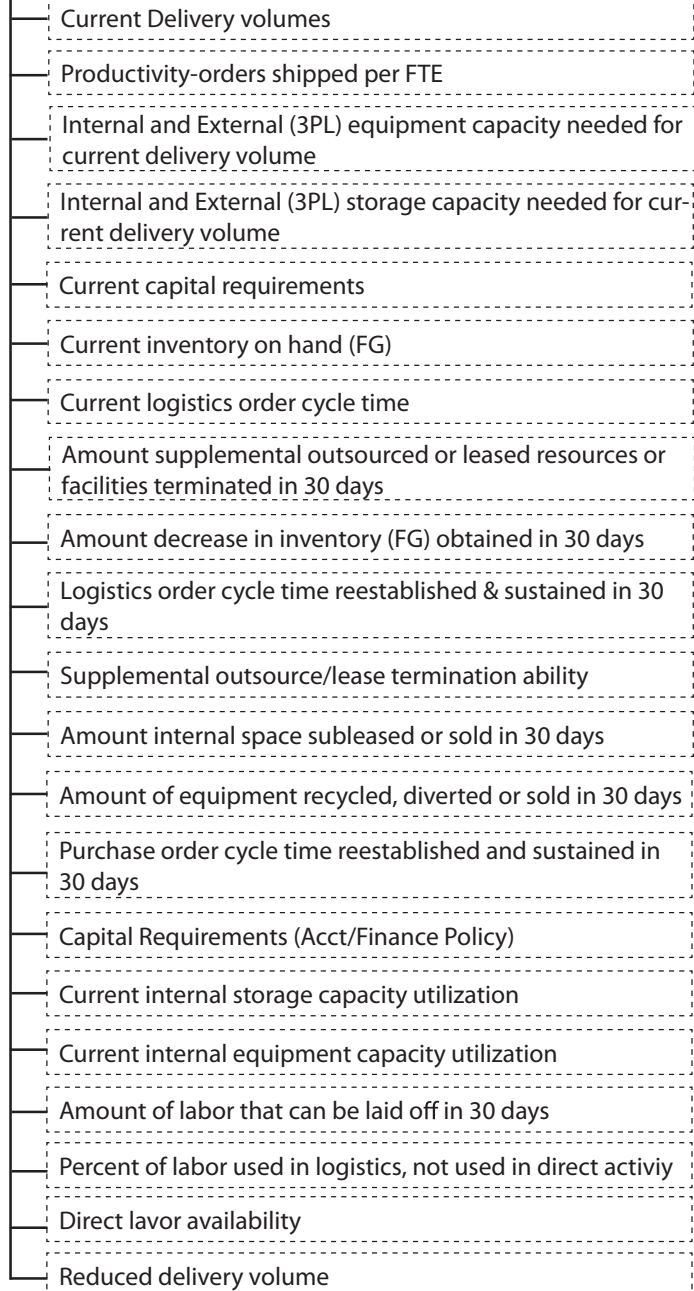
Level 1

AG.1.3 Downside Supply Chain Adaptability

Level 2

AG.2.13 Downside Deliver Adaptability

Level 3



The dashed line boxes represent optional metrics associated with specific level 3 processes.

Level 2 Agility Metrics

Metric ID	Metric Name	Metric Definition	Process
AG.2.14	Supplier's/ Customer's/ Products's Risk Rating	The numerical risk rating for supplier, customer or product. Normalized and used for comparison purposes.	sEP.9 Manage Supply Chain Plan Risk sES.9 Manage Supply Chain Source Risk sEM.9 Manage Supply Chain Make Risk sED.9 Manage Supply Chain Deliver Risk sER.9 Manage Supply Chain Return Risk
AG.2.15	Value at Risk (Plan)	The sum of probability of risk events times the monetary impact of the events in all Planning activities. Risk event here could be defined as the deviation from expected metrics value for the process.	sEP.9 Manage Supply Chain Plan Risk
AG.2.16	Value at Risk (Source)	The sum of probability of risk events times the monetary impact of the events in all Sourcing activities. Risk event here could be defined as the deviation from expected metrics value for the process.	sES.9: Manage Supply Chain Source Risk
AG.2.17	Value at Risk (Make)	The sum of probability of risk events times the monetary impact of the events in all Make activities. Risk event here could be defined as the deviation from expected metrics value for the process.	sEM.9: Manage Supply Chain Make Risk
AG.2.18	Value at Risk (Deliver)	The sum of probability of risk events times the monetary impact of the events in all Deliver activities. Risk event here could be defined as the deviation from expected metrics value for the process.	sED.9: Manage Supply Chain Deliver Risk
AG.2.19	Value at Risk (Return)	The sum of probability of risk events times the monetary impact of the events in all Return activities. Risk event here could be defined as the deviation from expected metrics value for the process.	sER.9: Manage Supply Chain Return Risk

Metric ID	Metric Name	Metric Definition	Process
AG.2.20	VAR of Internal Process Performance	Value at Risk = the sum of the probability of risk events times the monetary impact of the events for the specific process. For example: historical data or estimates for unanticipated plant shut downs, fires, regulatory issues, strikes, production short falls, etc. can be used to calculate VaR.	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
AG.2.21	VAR of Supplier Performance	Value at Risk = the sum of the probability of risk events times the monetary impact of the events for the specific supplier (or aggregate supply base). For example: supplier performance data for On time Deliveries, Perfect Order, etc. can be used to calculate VaR for a supplier.	sES.9: Manage Supply Chain Source Risk sEP.9: Manage Supply Chain Make Risk
AG.2.22	Event Risk (EVAR) (\$)	The risk (probability X impact) of risk events. i.e. plant outage, transportation outage, product failure, etc.	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
AG.2.23	Individual Process Area Event Rating (EVAR) (\$)	The specific rating (probability X impact) of a specific event.	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk

Level 3 Agility Metrics

Metric ID	Metric Name	Metric Definition	Process
AG.3.1	% of labor used in logistics, not used in direct activity	Percent of labor used in logistics, not used in direct activity	sD1: Deliver Stocked Product sD2: Deliver Make-to-Order Product sD3: Deliver Engineer-to-Order Product
AG.3.2	% of labor used in manufacturing, not used in direct activity	Percent of labor used in manufacturing, not used in direct activity	sM1: Make-to-Stock sM2: Make-to-Order sM3: Engineer-to-Order
AG.3.3	Additional deliver return volume	Additional customer return volume	sDR1: Deliver Return Defective Product sDR2: Deliver Return MRO Product sDR3: Deliver Return Excess Product
AG.3.4	Additional Delivery volume	Additional delivery volume	sD1: Deliver Stocked Product sD2: Deliver Make-to-Order Product sD3: Deliver Engineer-to-Order Product
AG.3.5	Additional demand sourcing-supplier constraints	Time required in negotiating new source/volume contracts/terms and time required to find/obtain additional source	sES.7: Manage Supplier Network sES.10: Manage Supplier Agreements
AG.3.6	Additional make volume	Additional make volume to be determined given increased resources	sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network
AG.3.7	Additional source return volume	Additional supplier return volume	sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration
AG.3.8	Additional Source Volumes	Additional source volume	sES.5: Manage Source Capital Assets sES.6: Manage Incoming Product sES.7: Manage Supplier Network sES.10: Manage Supplier Agreements
AG.3.9	Additional source volumes obtained in 30 days	Additional source volume to be determined given ramped up resources	sS1: Source Stocked Product sS2: Source Make-to-Order Product sS3: Source Engineer-to-Order Product
AG.3.10	Amount additional capital obtained in 30 days	How much capital can be obtained to fill gap between underutilized asset capacity and assets needed to increase and sustain quantities delivered given 30 days	sEP.10: Align Supply Chain Unit Plan with Financial Plan

Metric ID	Metric Name	Metric Definition	Process
AG.3.11	Amount additional equipment obtained in 30 days	How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increased and sustain quantities produced given 30 days in equipment such as manufacturing equipment, materials handling and packaging equipment, etc	sEP.5: Manage Integrated Supply Chain Capital Assets, sES.5: Manage Capital Assets, sEM.5: Manage Make Equipment and Facilities, sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets
AG.3.12	Amount additional internal space obtained in 30 days	How much assets/capacity can be obtained to fill gap between underutilized asset capacity and assets needed to increased and sustain quantities produced given 30 days in internal space	sEP.5: Manage Integrated Supply Chain Capital Assets, ES.5: Manage Capital Assets, sEM.5: Manage Make Equipment and Facilities, sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets
AG.3.13	Amount additional inventory (raw) received and made (WIP, FG) in 30 days	How much raw material inventory can be received and phased into manufacturing and produced into WIP and FG inventory, and sustained for order fulfillment, including safety stock given 30 days	sES.4: Manage Product Inventory, sEM.4: Manage In-Process Products, sED.4: Manage Finished Goods Inventories
AG.3.14	Amount additional labor recruited/hired/trained in 30 days	How much labor can be recruited/hired and trained to fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities produced given 30 days	
AG.3.15	Amount additional staff recruited/hired/trained in 30 days	How much labor can be recruited/hired and trained to fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities produced given 30 days	
AG.3.16	Amount additional staff/labor recruited/hired/trained in 30 days	How much staff/labor can be recruited/hired and trained fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities sourced given 30 days	
AG.3.17	Amount decrease in inventory (FG) obtained in 30 days	How much inventory can be shipped or diverted without cost penalty to ramp down to decreased quantities delivered given 30 days notice (all else equal in source and make, includes safety stock)	sED.4: Manage Finished Goods Inventories
AG.3.18	Amount decrease in inventory (Raw, Purchased FG) obtained in 30 days	How much inventory (raw material and purchased finished goods) can be returned, sold or diverted without cost penalty to ramp down to decreased quantities delivered given 30 days notice	sES.4: Manage Product Inventory, sED.4: Manage Finished Goods Inventories

Metric ID	Metric Name	Metric Definition	Process
AG.3.19	Amount labor recruited/hired/trained in 30 days	How much labor can be recruited/hired and trained to fill gap between underutilized FTE's and FTE's needed to increase and sustain quantities delivered given 30 days	
AG.3.20	Amount labor that can be laid off in 30 days	How much labor can be laid-off or diverted to other activities, without cost penalty, to ramp down to decreased quantities delivered given 30 days notice	sEM.8: Manage Make Regulatory Environment
AG.3.21	Amount of Equipment recycled, diverted, or sold in 30 days	How many capital equipment assets can be recycled, diverted or sold or subleased without cost penalty, to ramp down to decreased quantities delivered given 30 days notice	sEP.5: Manage Integrated Supply Chain Capital Assets, sES.5: Manage Capital Assets, sEM.5: Manage Make Equipment and Facilities, sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets
AG.3.22	Amount of inventory (Raw, Purchased FG) obtained in 30 days	How much inventory (raw material and purchased finished goods) can be obtained, delivered and phased in and sustained for order fulfillment, including safety stock given 30 days	sED.4: Manage Finished Goods Inventories
AG.3.23	Amount of staff that can be laid-off in 30 days	How much staff can be laid-off or diverted to other activities, without cost penalty, to ramp down to decreased quantities delivered given 30 days notice	
AG.3.24	Amount reduced inventory made (WIP, FG) in 30 days	How much manufacturing quantities (WIP and FG inventory), including safety stock can be ramped down to decreased order fulfillment quantities given 30 days notice	sEM.4: Manage In-Process Products, sED.4: Manage Finished Goods Inventories
AG.3.25	Amount supplemental outsourced or leased resources or facilities terminated in 30	How much supplemental outsourced or leased resources or facilities can be terminated to ramp down to decreased quantities delivered given 30 days notice	sEP.5: Manage Integrated Supply Chain Capital Assets, sES.5: Manage Capital Assets, sEM.5: Manage Make Equipment and Facilities, sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets

Metric ID	Metric Name	Metric Definition	Process
AG.3.26	Amount supplemental outsourced or leased resources or facilities obtained in 30 days	How much supplemental outsourced or leased resources or facilities can be obtained to increased and sustain quantities returned to suppliers given 30 day.	sEP.5: Manage Integrated Supply Chain Capital Assets, sES.5: Manage Capital Assets, sEM.5: Manage Make Equipment and Facilities, sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets
AG.3.27	Capital Availability	The percentage of orders that are fulfilled on the customer's original commit date	sEP.10: Align Supply Chain Unit Plan with Financial Plan
AG.3.28	Capital Requirements (Acct/Finance Policy)	The average time associated with Deliver Retail Processes	sEP.10: Align Supply Chain Unit Plan with Financial Plan
AG.3.29	Current Capital Requirements	Requirements on credit line, cash on hand and accounting procedures based on current sourcing situation	sEP.10: Align Supply Chain Unit Plan with Financial Plan
AG.3.30	Current capital requirements (accounting policy)	Accounting procedures for selling/diverting/recycling assets	sEP.10: Align Supply Chain Unit Plan with Financial Plan
AG.3.31	Current Deliver Return Volume	current return volume, number of orders returned	sDR1: Deliver Return Defective Product sDR2: Deliver Return MRO Product sDR3: Deliver Return Excess Product
AG.3.32	Current Delivery Volume	Number of orders shipped	sD1: Deliver Stocked Product sD2: Deliver Make-to-Order Product sD3: Deliver Engineer-to-Order Product sD4: Deliver Retail Product
AG.3.33	Current internal equipment capacity utilization	Current utilization of internal equipment capacity, including manufacturing equipment, materials handling and packaging equipment, etc.	sEP.5: Manage Integrated Supply Chain Capital Assets, sES.5: Manage Capital Assets, sEM.5: Manage Make Equipment and Facilities, sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets
AG.3.34	Current Internal facility/storage capacity utilization	Current utilization of internal facility/storage capacity, including facilities, space.	sEP.5: Manage Integrated Supply Chain Capital Assets, sES.5: Manage Capital Assets, sEM.5: Manage Make Equipment and Facilities, sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets

Metric ID	Metric Name	Metric Definition	Process
AG.3.35	Current Internal Storage capacity utilization	Current utilization of internal facility/ storage capacity, including facilities, space.	sEP.5: Manage Integrated Supply Chain Capital Assets, sES.5: Manage Capital Assets, sEM.5: Manage Make Equipment and Facilities, sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets
AG.3.36	Current Inventory on hand (FG)	Current on hand inventories (finished goods), including safety stock required to sustain current order fulfillment, assuming optimized inventory practices	sED.4: Manage Finished Goods Inventories
AG.3.37	Current Inventory on Hand (WIP, FG)	Current on hand inventories (work in process and purchased finished goods), including safety stock required to sustain current order fulfillment, assuming optimized inventory practices	sEM.4: Manage In-Process Products, sED.4: Manage Finished Goods Inventories
AG.3.38	Current Make Volume	Amount of each item which are manufactured	sM1: Make-to-Stock sM2: Make-to-Order sM3: Engineer-to-Order
AG.3.39	Current On-hand inventories (Raw, Purchased, FG)	Current on hand inventories (raw material and purchased finished goods), including safety stock required to sustain current order fulfillment, assuming optimized inventory practices	sES.4: Manage Product Inventory, sEM.4: Manage In-Process Products, sED.4: Manage Finished Goods Inventories
AG.3.40	Current Purchase Order Cycle Times	Sum of time to place a purchase order and supplier lead time	sS1: Source Stocked Product sS2: Source Make-to-Order Product sS3: Source Engineer-to-Order Product
AG.3.41	Current source return volume	current return volume, number of orders returned	sSR1: Source Return Defective Product sSR3: Source Return Excess Product
AG.3.42	Current Source Volume	Amount of each item which are purchased	sS1: Source Stocked Product sS2: Source Make-to-Order Product sS3: Source Engineer-to-Order Product
AG.3.43	Current Sourcing/ Supplier Constraints	Current contract terms and nature of items (commodity/sole source)	sES.10: Manage Supplier Agreements
AG.3.44	Customer return order cycle time reestablished and sustained in 30 days	Customer return order cycle time reestablished and sustained for increased quantities returned from customer given 30 days, including customer return order processing cycle time, transit time, return processing and disposition cycle time, etc.	sDR1: Deliver Return Defective Product sDR2: Deliver Return MRO Product sDR3: Deliver Return Excess Product

Metric ID	Metric Name	Metric Definition	Process
AG.3.45	Customer Service staff/Logistics labor availability	Customer service staff / Logistics labor availability	
AG.3.46	Demand sourcing-supplier constraints	Percentage of orders with on time and accurate documentation supporting the order, including packing slips, bills of lading, invoices, etc. [Total number of orders delivered with correct and timely documentation] / [Total number of orders delivered] x 100%	sS1: Source Stocked Product sS2: Source Make-to-Order Product sS3: Source Engineer-to-Order Product
AG.3.47	Direct Labor Availability	Labor needed to meet current demand, productivity-units/orders per FTE	sEM.2: Manage Production Performance
AG.3.48	Internal and External (3PL) equipment capacity needed for current delivery volume	Internal and external (3PL) capacity needed for current demand throughput in fleet equipment, outside carrier loads, materials handling equipment, etc.	sED.5: Manage Deliver Capital Assets sED.6: Manage Transportation
AG.3.49	Internal and External (3PL) Equipment capacity needed for current return volume	Internal and external (3PL) capacity needed for current return throughput in fleet equipment, outside carrier loads, materials handling equipment, etc.	sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration
AG.3.50	Internal and External (3PL) Equipment needed for current return volume	Internal and External (3PL) Equipment needed for current return volume	sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration
AG.3.51	Internal and External (3PL) storage capacity needed for current delivery volume	Internal and external (3PL) capacity needed for current demand throughput in facilities and space.	sED.5: Manage Deliver Capital Assets sED.6: Manage Transportation
AG.3.52	Internal and External (3PL) storage capacity needed for current return volume	Internal and external (3PL) capacity needed for current return throughput in facilities and space.	sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration

Metric ID	Metric Name	Metric Definition	Process
AG.3.53	Internal and External facilities/ storage capacity needed for current make volume	Internal and external (outsourced) capacity needed for current demand throughput in facilities and space	sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network
AG.3.54	Internal and External manufacturing equipment capacity needed for current make volume	Internal and external (outsourced) capacity needed for current demand throughput in manufacturing equipment	sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network
AG.3.55	Internal Event Response (average days)	The average response time (in days) to an internal risk event from the time of the event (included detection lags)	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
AG.3.56	Logistics order cycle time reestablished and sustained in 30 days	Logistics order cycle time reestablished and sustained for increased quantities produced given 30 days, including customer order processing cycle time, dock-to-stock cycle time, pick-to-ship cycle, transit time, etc	sED.5: Manage Deliver Capital Assets, sED.6: Manage Transportation
AG.3.57	Manufacturing cycle time reestablished and sustained in 30 days	Manufacturing cycle time reestablished and sustained for increased quantities produced given 30 days	sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network
AG.3.59	Procurement Staff Availability	Staff availability in procurement	sES.7: Manage Supplier Network
AG.3.60	Procurement staff/Logistics labor availability	Procurement staff / Logistics labor availability	sES.7: Manage Supplier Network

Metric ID	Metric Name	Metric Definition	Process
AG.3.61	Productivity orders shipped per FTE	Productivity-order shipped per FTE to meet current requirements	sED.2: Assess Delivery Performance
AG.3.62	Productivity-orders returned per FTE	Productivity orders returned per FTE	sER.2: Manage Performance of Return Processes
AG.3.63	Productivity-Purchase orders per FTE	Productivity-purchase order per FTE to meet current requirements	sES.2: Assess Supplier Performance
AG.3.64	Productivity-units/orders produced per FTE	Productivity-purchase order per FTE to meet current requirements	sEM.2: Manage Production Performance
AG.3.65	Purchase order cycle time reestablished and sustained in 30 days	Procurement order cycle time reestablishment and sustained for increased quantities sourced given 30 days, including time to place a purchase order and supplier lead time	sES.7: Manage Supplier Network sES.10: Manage Supplier Agreements
AG.3.66	Reduced delivery volume	Reduced delivery volume to be determined given ramped down resources	sED.5: Manage Deliver Capital Assets
AG.3.67	Reduced Make volume	Reduced make volume to be determined given ramped down resources	sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network
AG.3.68	Reduced source volumes accomplished in 30 days	Reduced source volume to be determined given ramped down resources	sES.5: Manage Source Capital Assets sES.6: Manage Incoming Product sES.7: Manage Supplier Network sES.10: Manage Supplier Agreements
AG.3.69	Supplemental outsource/lease availability	Including facilities, leasing building, leasing manufacturing equipment, materials handling and packaging equipment, co packers, etc.	sEM.7: Manage Production Network
AG.3.70	Supplemental outsource/lease termination ability	Including facilities, leasing building, leasing manufacturing equipment, materials handling and packaging equipment, co packers, etc.	sEM.7: Manage Production Network
AG.3.71	Time needed to increase inventory (FG) for additional order fulfillment	Amount of time needed to increase finished inventory for order fulfillment (time to receive/stock inventory) including safety stock to sustain 20% increase in quantities sourced	sEP4: Manage Integrated Supply Chain Inventory

Metric ID	Metric Name	Metric Definition	Process
AG.3.72	Time needed to increase inventory (WIP, FG) for additional order fulfillment	Amount of time needed to receive and phase in raw material inventory for manufacturing and make WIP and FG (work in process and purchased finished goods) inventory, including safety stock to sustain 20% increase in quantities sourced	sEP.4: Manage Integrated Supply Chain Inventory
AG.3.73	Time needed to increase inventory for additional order fulfillment (Raw, Purchase)	Amount of time needed to obtain, deliver and phase in inventory (raw material and purchased finished goods) for order fulfillment, including safety stock to sustain 20% increase in quantities sourced	sEP.4: Manage Integrated Supply Chain Inventory
AG.3.74	Time needed to obtain additional capital	Amount of time needed to obtain capital to fill gap between current capital availability and capital needed to sustain 20% increase in quantities ordered	sEP.10: Align Supply Chain Unit Plan with Financial Plan
AG.3.75	Time needed to obtain additional equipment	Amount of time needed to obtain assets/capacity to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities delivered in equipments	sEP.5: Manage Integrated Supply Chain Capital Assets sES.5: Manage Capital Assets sEM.5: Manage Make Equipment and Facilities sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets
AG.3.76	Time needed to obtain additional internal space	Amount of time needed to obtain assets/capacity to fill gap between underutilized asset capacity and assets needed to sustain 20% increase in quantities delivered in internal space	sEP.5: Manage Integrated Supply Chain Capital Assets sES.5: Manage Capital Assets sEM.5: Manage Make Equipment and Facilities sED.5: Manage Deliver Capital Assets sER.5: Manage Return Capital Assets
AG.3.77	Time needed to obtain supplemental outsourced (3PL) or leased resources or facilities	Amount of time needed to obtain supplemental outsourced or leased resources or facilities to sustain 20% increase in quantities delivered	sES.5: Manage Source Capital Assets sES.6: Manage Incoming Product sES.7: Manage Supplier Network, sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network sED.5: Manage Deliver Capital Assets sED.6: Manage Transportation sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration

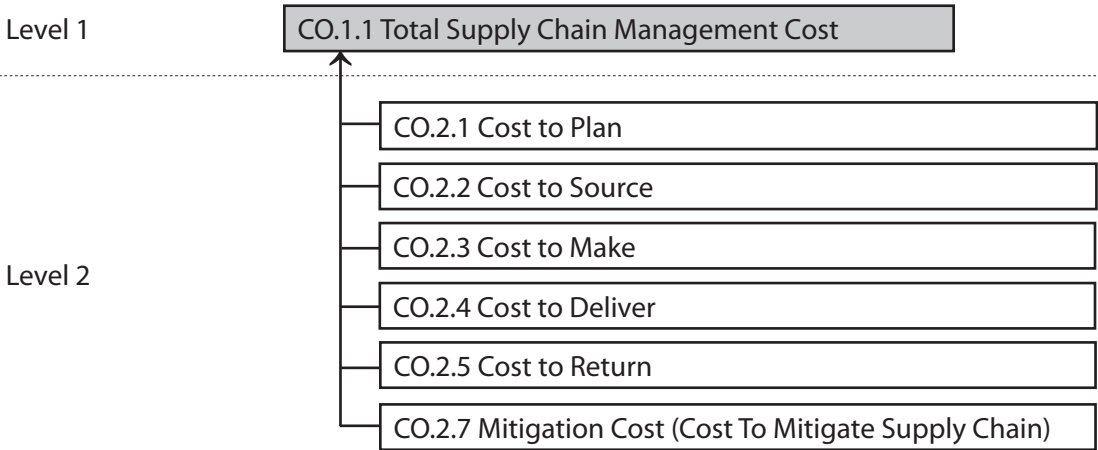
Metric ID	Metric Name	Metric Definition	Process
AG.3.78	Time needed to obtain supplemental outsourced or leased resources or facilities	Amount of time needed to obtain supplemental outsourced or leased resources or facilities to sustain 20% increase in quantities made	sES.5: Manage Source Capital Assets sES.6: Manage Incoming Product sES.7: Manage Supplier Network, sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Make Transportation sEM.7: Manage Make Network sED.5: Manage Deliver Capital Assets sED.6: Manage Transportation sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration
AG.3.79	Time needed to recruit/hire/train additional labor	Amount of time needed to recruit/hire/train additional labor to fill gap between underutilized FTE's and labor needed to sustain 20% increase in quantities manufactured	
AG.3.80	Time needed to recruit/hire/train additional staff	Amount of time needed to recruit/hire/train additional staff to fill gap between underutilized FTE's and staff needed to sustain 20% increase in quantities delivered	
AG.3.81	Time needed to recruit/hire/train additional staff/labor	Amount of time needed to recruit/hire/train additional labor to fill gap between underutilized FTE's and labor needed to sustain 20% increase in quantities returned to suppliers	

Total Supply Chain Management Cost

The sum of the costs associated with the SCOR Level 2 processes to Plan, Source, Deliver, and Return.

Note - Cost of Raw Material and Make Costs are generally accounted for in COGS. It is recognized that there is likely to be overlap/ redundancy between supply chain management costs and COGS.

Qualitative Relationship Description
None Identified
Quantitative Relationship (optional, if calculable)
TSCMC = Cost to Plan + Source + Make + Deliver + Return + Mitigate Supply Chain Risk
Calculation
TSCMC = Sales – Profits – Cost to Serve (e.g., marketing, selling, administrative)
Data Collection
Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization’s general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations “horizontal” core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).
Discussion
Collecting transactional information, primarily resource expenses and operational “drivers”, is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the “horizontal” processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.
Hierarchical Metric Structure



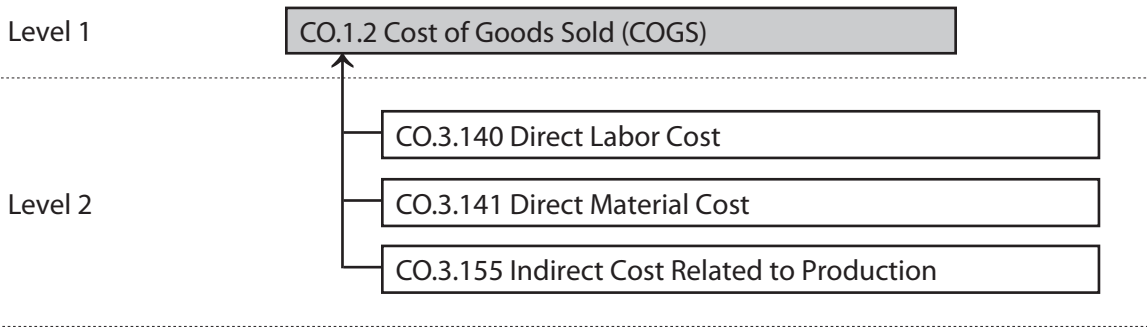
CO.1.2

Cost of Goods Sold

The cost associated with buying raw materials and producing finished goods. This cost includes direct costs (labor, materials) and indirect costs (overhead).

Note - Cost of Raw Material and Make Costs are generally accounted for in COGS. It is recognized that there is likely to be overlap/ redundancy between supply chain management costs and COGS.

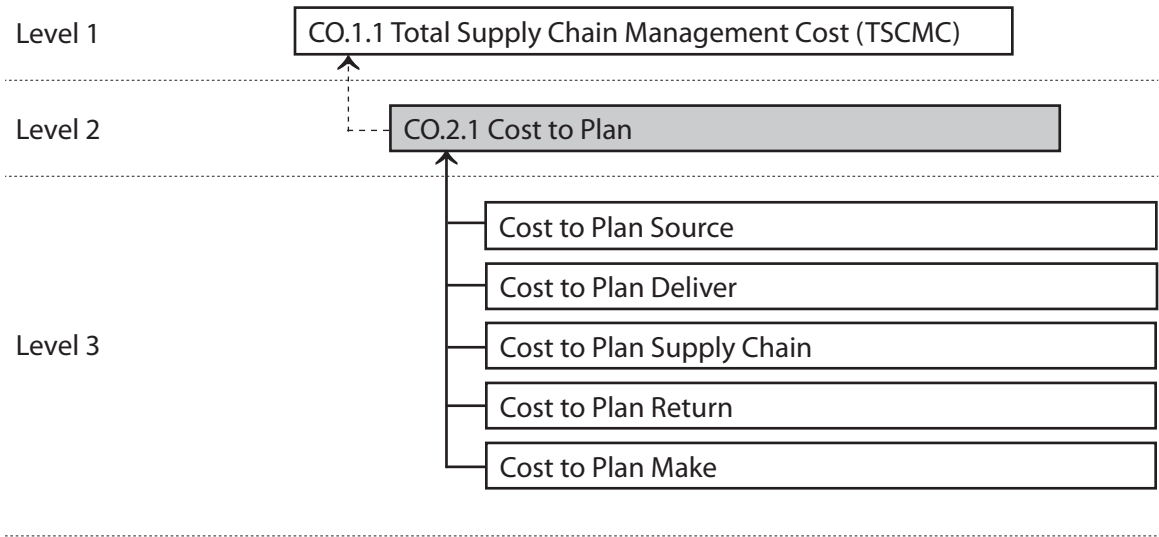
Qualitative Relationship Description
None Identified
Quantitative Relationship (optional, if calculable)
Cost of Goods Sold (COGS) = Cost to Make
Calculation
COGS = direct material costs + direct labor costs + indirect costs related to making product
Data Collection
Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).
Discussion
Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.
Hierarchical Metric Structure



Cost to Plan

The sum of the costs associated with Plan. (Processes: sP1, sP2, sP3, sP4, sP5)

Qualitative Relationship Description
None Identified
Quantitative Relationship (optional, if calculable)
Cost to Plan = Sum of Cost to Plan (Plan + Source + Make + Deliver + Return)
Calculation
None Identified
Data Collection
Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization’s general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations “horizontal” core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).
Discussion
Collecting transactional information, primarily resource expenses and operational “drivers”, is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the “horizontal” processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.
Hierarchical Metric Structure



CO.2.2

Cost to Source

The sum of the costs associated with Source. (Processes: sS1, sS2, sS3)

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Cost to Source = Sum of Cost for (Supplier Management + Material Acquisition Management)

Calculation

- Supplier Management = material planning + planning procurement staff + supplier negotiation and qualification + etc.
- Material Acquisition Management = bidding and quotations + ordering + receiving + incoming material inspection + material storage + payment authorization + sourcing business rules and rqmts. + inbound freight and duties + etc.

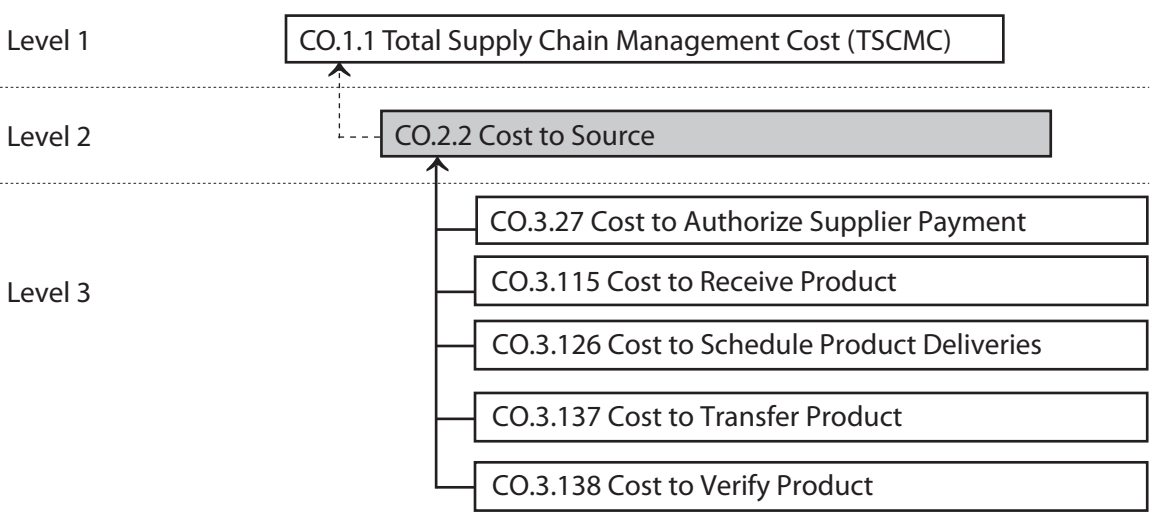
Data Collection

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Discussion

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchical Metric Structure



Cost to Make

The sum of the costs associated with Make.

Note - Cost of Raw Material and Make Costs are generally accounted for in COGS. It is recognized that there is likely to be overlap/ redundancy between supply chain management costs and COGS. (Processes: sM1, sM2, sM3)

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Cost to Make = Sum of Direct Material, Direct Labor, and Direct non-Material Product-related Cost (equipment) and of Indirect Product-related Cost

Calculation

Cost to Make = Sum of Direct Material, Direct Labor, and Direct non-Material Product-related Cost (equipment) and Indirect Product-related Cost NOT part of CO.1.2 Cost of Goods Sold.

Data Collection

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) Employee time collection systems (or % split estimates), and (2) Operational systems (e.g., enterprise resource planning [ERP] systems). In some cases, (1) direct material data is maintained at the "unit level" in bills of material (BOMs) or recipe formulas; and (2) direct labor and direct non-material product (equipment) data is maintained at the "unit level" in labor/machine routings or process sheets.

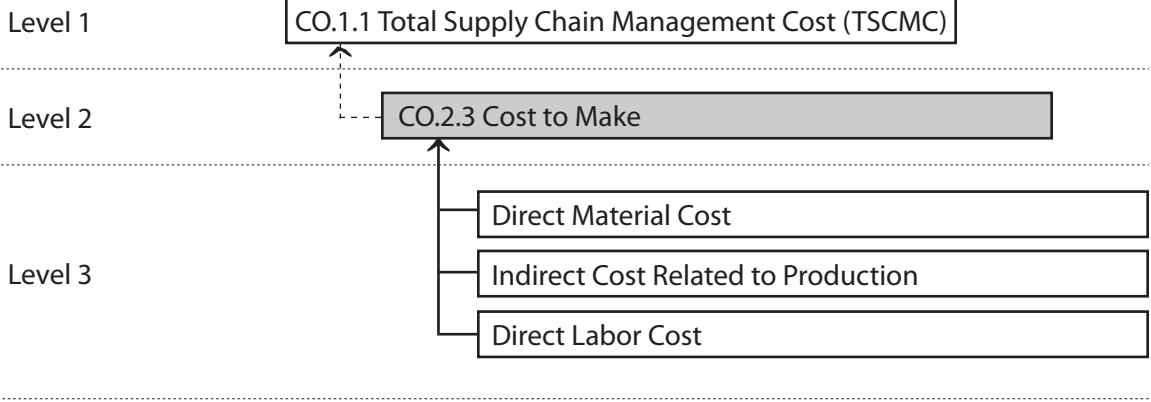
Discussion

Cost to Make includes all Make related cost NOT included in CO.1.2 Cost of Goods Sold. In SCOR 10 Cost of Goods Sold and Cost to Make have been clearly separated to avoid the ongoing confusion. CO.1.1 should not include any of the cost included in CO.1.2 Cost of Goods Sold.

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of (1) the "horizontal" processes (referenced in Lean environments as "value-stream mapping"), and (2) products (or intermediate outputs) – with both types of calculations based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

CO.2.3

Hierarchical Metric Structure



Cost to Deliver and/or Install

The sum of the costs associated with Deliver and/or Install. (Processes: sD1, sD2, sD3)

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Cost to Deliver = Sum of Cost of (Sales order management + Customer Management)

Calculation

- Sales order management = inquiry & quotations + order entry & maintenance + channel management + order fulfillment + distribution + transportation + outbound freight and duties + installation + customer invoicing / accounting + new product release / phase-in + etc.
- Customer Management = financing + post-sales customer service + handling disputes + field repairs + enabling technologies + etc.

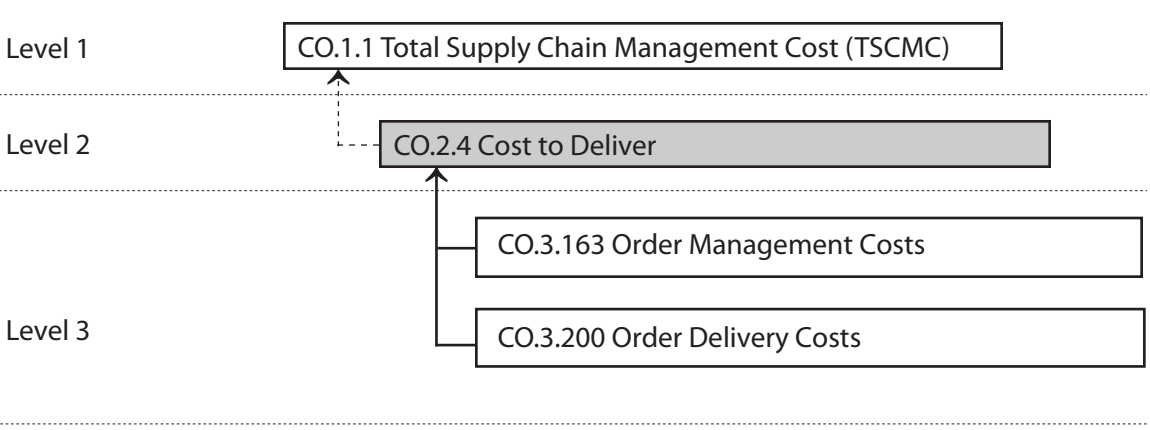
Data Collection

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization’s general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations “horizontal” core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Discussion

Collecting transactional information, primarily resource expenses and operational “drivers”, is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the “horizontal” processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchical Metric Structure



Cost to Return

Cost to Return Defective Product - The sum of the costs associated with returning a defective product to the supplier. (Processes: sSR1, sDR1) Cost to Return Excess Product - The sum of the costs associated with returning excess product to the supplier. (Processes: sSR3, sDR3) Cost to Return MRO Product - The sum of the costs associated with returning MRO product to the supplier. (Processes: sSR2, sDR2)

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Cost to Return = Sum of Cost to Return (to Sources + from Customers)

Calculation

- Cost to Return to Source (sSRx) = Verify Defective Product Costs + Disposition of Defective Product Costs + Identify MRO Condition Costs + Request MRO Return Authorization Costs + Schedule MRO Shipment Costs + Return MRO Product Costs + etc.
- Cost to Return From Customer (sDRx) = Authorization Costs + Schedule Return Costs + Receive Costs + Authorize MRO Return Costs + Schedule MRO Return Costs + Receive MRO Return Costs + Transfer MRO Product Costs + etc.

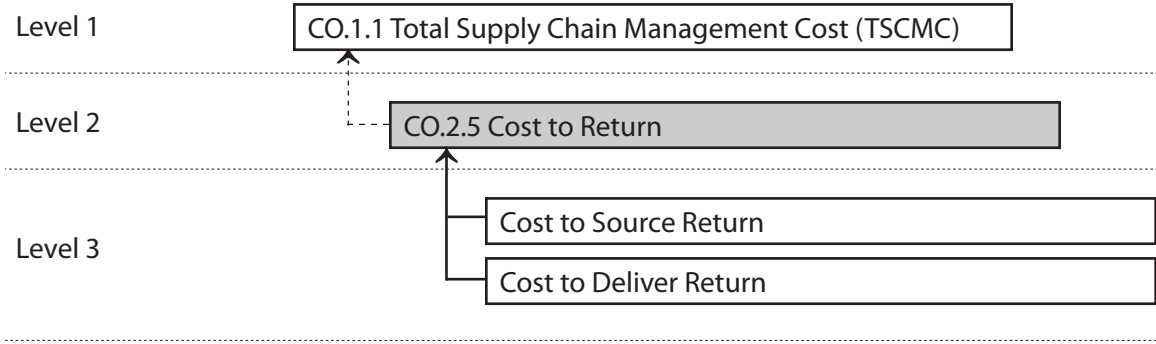
Data Collection

Resource expenses (e.g., salaries, supplies, etc.) are initially captured in the organization's general ledger accounting system. Then these expenses are traced and assigned (i.e., distributed) to the organizations "horizontal" core processes based employee time and non wage-related factors (drivers; e.g., # of units consumed). Data for these expense distribution assignments are collected from (1) employee time collection systems (or % split estimates), and (2) operational systems (e.g., enterprise resource planning [ERP] systems).

Discussion

Collecting transactional information, primarily resource expenses and operational "drivers", is now commonplace. The challenging task is to logically transform these expenses into calculated costs of the "horizontal" processes based on cause-and-effect relationships without the temptation of using broad averages or arbitrary factors.

Hierarchical Metric Structure



Mitigation Cost (Costs to Mitigate Supply Chain Risk)

Mitigation Cost (\$) is a diagnostic metric for CO.1.1: Supply Chain Management Cost (total).

The sum of the costs associated with managing non-systemic risks that arise from special cause variations within the supply chain (defined as variations which are not predictable; have an assignable cause; and its pattern of occurrence are not inherent to the system's behavior; rather are un-natural) (see Discussion section below for more information).

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Mitigation Costs (Cost to Mitigate Supply Chain Risk) = Sum of Supply Chain Risk Mitigation Costs (Plan + Source + Make + Deliver + Return)

Calculation

Mitigation Costs (Cost to Mitigate Non-Systemic Supply Chain Risk) = Sum of Supply Chain Risk Mitigation Costs (Plan + Source + Make + Deliver + Return)

Data Collection

The total supply chain risk mitigation cost of all mitigation actions for non-systemic risks in a specific area, supplier, product, etc. (\$)

Discussion

Sourced from the book "Risk Management Essentials - What Every Business Professional Should Know" by Rai Chowdhary

"Determining the costs for risk mitigation can be confusing – since one could argue much of what gets done in business is to manage risks of one form or another. How is one to decide between the normal cost of doing business, and the "extra" cost incurred for risk mitigation?

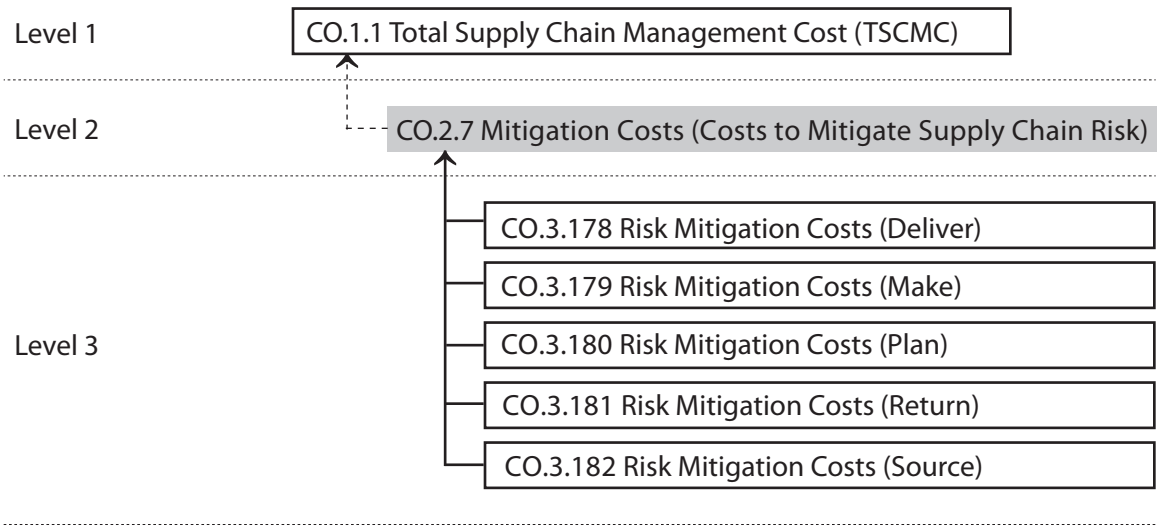
To address this question we will draw upon the terms used by Deming and Shewhart to describe Variation. Two distinct types of variation were defined - Common cause variation, and Special cause variation.

Common cause variation is that which is inherent to the system, and is predictable via probabilistic analysis. There are not clear assignable causes – but a multitude of causes might exist to give rise to such variation. To control common cause variation one needs to work on improving the system at large.

Special cause variation is that which is not predictable, and has an assignable cause. Its pattern of occurrence is not inherent to the system's behavior; rather it is un-natural.

Based on the above, we can say that risks can be categorized into two types – those that are inherent to the way the system is setup – these we will call Systemic Risks and the costs associated with the mitigation of these shall be treated as the normal cost of doing business. The other risks – those that arise out of assignable causes / events and are unpredictable shall be referred to as Non-Systemic Risks. The costs associated with the management of these risks should be captured separately - under mitigation costs. Doing so enables the organization to "see" the costs of such risks, and determine where additional controls and / or vigilance will be helpful. "

Hierarchical Metric Structure



Processes

- sEP.9 Manage Supply Chain Plan Risk
- sES.9 Manage Supply Chain Source Risk
- sEM.9 Manage Supply Chain Make Risk
- sED.9 Manage Supply Chain Deliver Risk
- sER.9 Manage Supply Chain Return Risk

Level 3 Cost Metrics

Metric ID	Metric Name	Metric Definition	Process
CO.3.1	% Defective Product Scheduling Cost to Total Source Return Cost	% Defective Product Scheduling Cost to Total Source Return Cost	sSR1.4: Schedule Defective Product Shipment
CO.3.2	% Excess Product Scheduling Cost to Total Source Return Cost	% Excess Product Scheduling Cost to Total Source Return Cost	sSR3.4: Schedule Excess Product Shipment
CO.3.3	% MRO Scheduling Cost to Total Source Return Cost	% MRO Scheduling Cost to Total Source Return Cost	sSR2.4: Schedule MRO Shipment
CO.3.4	% of authorization request transmitted error-free/total authorization requests	% of authorization request transmitted error-free/total authorization requests	sSR3.3: Request Excess Product Return Authorization sSR2.3: Request MRO Return Authorization
CO.3.5	% of excess packaging per unit	Weight of packaging material that is not needed to protect the product during shipping as a per cent of total packaging material used	sM1.4: Package sM2.4: Package sM3.5: Package
CO.3.6	% of paints used that are non-toxic	The volume of paint that does not include toxic ingredients as a percent of total paint volume used	sEM.6: Manage Transportation (WIP)
CO.3.7	% of pallets that are reusable	Number of reusable pallets used as a percent of total pallets used	sEM.6: Manage Transportation (WIP)
CO.3.8	% of solid waste consisting of packaging material	The weight of packaging material waste as a percent of total solid waste generated.	sM1.3: Produce and Test sM3.4: Produce and Test sM2.3: Produce and Test
CO.3.9	% of trucks using retread tires	Number of trucks using retreaded tires as a percent of trucks in the carrier fleet	sEM.6: Manage Transportation (WIP)

Metric ID	Metric Name	Metric Definition	Process
CO.3.10	% of vehicle fuel derived from alternative fuels	The portion of transfer vehicle fuels that are non-petroleum based	sM1.2: Issue Material sS1.4: Transfer Product sM3.3: Issue Sourced/In-Process Product sEM.6: Manage Transportation (WIP) sED.6: Manage Transportation sM2.2: Issue Sourced/In-Process Product
CO.3.11	% of warehouse loading machinery using MFBs	The percent of warehouse machines using maintenance free batteries	sES.4: Manage Product Inventory
CO.3.12	% packaging material consisting of post-consumer recycled content	Weight of recycled packaging material as a per cent of total packaging material used	sM1.4: Package sM2.4: Package sM3.5: Package
CO.3.13	% packaging material that is biodegradable	Weight of biodegradable packaging material as a per cent of total packaging material used	sM1.4: Package sM2.4: Package sM3.5: Package
CO.3.14	% packaging material that is recyclable/reusable	Weight of packaging material that can be effectively recycled as a per cent of total packaging material used	sM1.4: Package sM2.4: Package sM3.5: Package
CO.3.15	Air emissions	The weight of air pollutant emitted per weight of finished good produced	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test
CO.3.16	Assessment / Risk Management Costs (\$)	The cost of risk assessment and management activities for a specific area, supplier, product, etc.(\$)	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
CO.3.17	Cost of identifying the defective condition as a % of total Source cost	Cost of identifying the defective condition as a % of total Source cost	sSR1.1: Identify Defective Product Condition

Metric ID	Metric Name	Metric Definition	Process
CO.3.18	Cost of Identifying the MRO Condition as a % of Total Source Return Cost	Cost of Identifying the MRO Condition as a % of Total Source Return Cost	sSR2.1: Identify MRO Product Condition
CO.3.19	Cost of identifying the excess condition as a % of total Source cost	Cost of identifying the excess condition as a % of total Source cost	sSR3.1: Identify Excess Product Condition
CO.3.20	Cost per request authorization	Cost per request authorization	sSR1.5: Return Defective Product sSR2.5: Return MRO Product sSR3.5: Return Excess Product sSR1.3: Request Defective Product Return Authorization sSR2.3: Request MRO Return Authorization sSR3.3: Request Excess Product Return Authorization
CO.3.21	Cost to Align Supply Chain Unit Plan with Financial Plan	The sum of the costs associated with aligning supply chain performance plans with financial plans.	sEP.10: Align Supply Chain Unit Plan with Financial Plan
CO.3.22	Cost to Assess Delivery Performance	The sum of the costs associated with assessing delivery performance.	sED.2: Assess Delivery Performance
CO.3.23	Cost to Assess Supplier Performance	The sum of the costs associated with assessing supplier performance.	sES.2: Assess Supplier Performance
CO.3.24	Cost to Authorize Defective Product Return	The sum of the costs associated with authorizing the return of defective product.	sDR1.1: Authorize Defective Product Return
CO.3.25	Cost to Authorize Excess Product Return	The sum of the costs associated with authorizing the return of excess product.	sDR3.1: Authorize Excess Product Return
CO.3.26	Cost to Authorize MRO Product Return	The sum of the costs associated with authorizing the return of product to be maintained, repaired, or overhauled.	sDR2.1: Authorize MRO Product Return
CO.3.27	Cost to Authorize Supplier Payment	The sum of the costs associated with authorizing supplier payment.	sS1.5: Authorize Supplier Payment sS2.5: Authorize Supplier Payment sS3.7: Authorize Supplier Payment

Metric ID	Metric Name	Metric Definition	Process
CO.3.28	Cost to Balance Production Resources with Production Requirements	The sum of the costs associated with identifying, assessing and aggregating production resources.	sP3.3: Balance Production Resources with Production Requirements
CO.3.29	Cost to Balance Product Resources with Product Requirements	The sum of the costs associated with balance of product resources with product requirements.	sP2.3: Balance Product Resources with Product Requirements
CO.3.30	Cost to Balance Supply Chain Resources with Supply Chain Requirements	The sum of the costs associated with balance of supply chain resources with supply chain requirements.	sP1.3: Balance Supply Chain Resources with SC Requirements
CO.3.31	Cost to Build Loads	The sum of the costs associated with building transportation loads.	sD1.5: Build Loads sD2.5: Build Loads sD3.5: Build Loads
CO.3.32	Cost to Checkout	The sum of the costs associated with product checkout.	sD4.6: Checkout
CO.3.33	Cost to Consolidate Orders	The sum of the costs associated with consolidating customer orders.	sD1.4: Consolidate Orders sD2.4: Consolidate Orders
CO.3.34	Cost to Deliver and/or Install	The sum of the costs associated with deliver and/or install	sD4.7: Deliver and/or Install
CO.3.35	Cost to Deliver Return	Cost to Return From Customer (DRx) = Authorization Costs + Schedule Return Costs + Receive Costs + Authorize MRO Return Costs + Schedule MRO Return Costs + Receive MRO Return Costs + Transfer MRO Product Costs + etc.	sDR1: Deliver Return Defective Product sDR2: Deliver Return MRO Product
CO.3.36	Cost to Enter Order, Commit Resources & Launch Program	The sum of the costs associated with entering the order, committing resources & launching a program.	sD3.3: Enter Order, Commit Resources Launch Program
CO.3.37	Cost to Establish and Communicate Return Plans	The sum of the costs associated with establishing and communicating return plans.	sP5.4: Establish and Communicate Return Plans
CO.3.38	Cost to Establish and Communicate Supply Chain Plans	The sum of the costs associated with establishing and communicating supply chain plans.	sP1.4: Establish & Communicate Supply-Chain Plans

Metric ID	Metric Name	Metric Definition	Process
CO.3.39	Cost to Establish Delivery Plans	The sum of the costs associated with establishing and communicating deliver plans.	sP4.4: Establish Delivery Plans
CO.3.40	Cost to Establish Production Plans	The sum of the costs associated with establishing and communicating production plans.	sP3.4: Establish Production Plans
CO.3.41	Cost to Establish Sourcing Plans	The sum of the costs associated with establishing and communicating source plans.	sP2.4: Establish Sourcing Plans
CO.3.42	Cost to Fill Shopping Cart	The sum of the costs associated with filling a shopping cart.	sD4.5: Fill Shopping Cart
CO.3.43	Cost to Finalize Production Engineering	The sum of the costs associated with finalizing production engineering.	sM3.1: Finalize Production Engineering
CO.3.44	Cost to Generate Stocking Schedule	The sum of the costs associated with generating a stocking schedule.	sD4.1: Generate Stocking Schedule
CO.3.45	Cost to Identify Sources of Supply	The sum of the costs associated with identifying sources of supply.	sS3.1: Identify Sources of Supply
CO.3.46	Cost to Identify, Assess, and Aggregate Delivery Resources	The sum of the costs associated with identifying, assessing and aggregating delivery resources.	sP4.2: Identify, Assess and Aggregate Delivery Resources sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements
CO.3.47	Cost to Identify, Assess, and Aggregate Product Resources	The sum of the costs associated with identifying, assessing and aggregating product resources.	sP2.2: Identify, Assess and Aggregate Product Resources
CO.3.48	Cost to Identify, Assess, and Aggregate Production Resources	The sum of the costs associated with identifying, assessing and aggregating production resources.	sP3.2: Identify, Assess and Aggregate Production Resources
CO.3.49	Cost to Identify, Assess, and Aggregate Return Resources	The sum of the costs associated with identifying, assessing and aggregating return resources.	sP5.2: Identify, Assess, and Aggregate Return Resources sP5.3: Balance Return Resources with Return Requirements
CO.3.50	Cost to Identify, Assess, and Aggregate Supply Chain Resources	The sum of the costs associated with identifying, assessing and aggregating supply chain resources.	sP1.2: Identify, Prioritize and Aggregate SC Resources

Metric ID	Metric Name	Metric Definition	Process
CO.3.51	Cost to Identify, Prioritize, and Aggregate Delivery Requirements	The sum of the costs associated with identifying, assessing and aggregating deliver requirements	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
CO.3.52	Cost to Identify, Prioritize, and Aggregate Product Requirements	The sum of the costs associated with identifying, assessing and aggregating deliver requirements.	sP2.1: Identify, Prioritize and Aggregate Product Requirements
CO.3.53	Cost to Identify, Prioritize, and Aggregate Production Requirements	The sum of the costs associated with identifying, assessing and aggregating production requirements	sP3.1: Identify, Prioritize and Aggregate Production Requirements
CO.3.54	Cost to Identify, Prioritize, and Aggregate Return Requirements	The sum of the costs associated with identifying, assessing and aggregating return requirements.	sP5.1: Assess and Aggregate Return Requirements
CO.3.55	Cost to Identify, Prioritize, and Aggregate Supply Chain Requirements	The sum of the costs associated with identifying, assessing and aggregating supply chain requirements.	sP1.1: Identify, Prioritize and Aggregate SC Requirements
CO.3.56	Cost to Install Product	The sum of the costs associated with product installation.	sD1.14: Install Product sD2.14: Install Product sD3.14: Install Product
CO.3.57	Cost to Invoice	The sum of the costs associated with invoicing.	sD1.15: Invoice
CO.3.58	Cost to Issue Material	The sum of the costs associated with issuing material.	sM1.2: Issue Material
CO.3.59	Cost to Issue Sourced/In-Process Product	The sum of the costs associated with issuing sourced or in-process material.	sM2.2: Issue Sourced/In-Process Product sM3.3: Issue Sourced/In-Process Product
CO.3.60	Cost to Load Product & Generate Shipping Documentation	The sum of the costs associated with loading product & generating shipping documentation.	sD1.11: Load Vehicle & Generate Shipping Documentation sD2.11: Load Product & Generate Shipping Documentation sD3.11: Load Product & Generate Shipping Documents
CO.3.61	Cost to Maintain Source Data	The sum of the costs associated with maintaining supplier data.	sES.3: Maintain Source Data

Metric ID	Metric Name	Metric Definition	Process
CO.3.62	Cost to Manage Business Rules for PLAN Processes	The sum of the .Costs to Manage Business Rules for PLAN Processes	sEP.1: Manage Business Rules for Plan Processes
CO.3.63	Cost to Manage Business Rules for Return Processes	The sum of the Cost to Manage Business Rules for Return Processes	sER.1: Manage Business Rules for Return Processes
CO.3.64	Cost to Manage Deliver Business Rules	The sum of the Costs to Manage Deliver Business Rules	sED.1: Manage Deliver Business Rules
CO.3.65	Cost to Manage Deliver Capital Assets	The sum of the Costs to Manage Deliver Capital Assets	sED.5: Manage Deliver Capital Assets
CO.3.66	Cost to Manage Deliver Information	The sum of the Cost to Manage Deliver Information	sED.3: Manage Deliver Information
CO.3.67	Cost to Manage Finished Goods Inventories	The sum of the Costs to Manage Finished Good Inventory	sED.4: Manage Finished Goods Inventories
CO.3.68	Cost to Manage Import/Export Requirements	The sum of the costs associated with the management of import/export requirements	sED.8: Manage Import/Export Requirements sES.8: Manage Import/Export Requirements
CO.3.69	Cost to Manage In-Process Products (WIP)	The sum of the costs associated with managing in-process products (WIP).	sEM.4: Manage In-Process Products (WIP)
CO.3.70	Cost to Manage Incoming Product	The sum of the costs associated with managing incoming product.	sES.6: Manage Incoming Product
CO.3.71	Cost to Manage Integrated Supply Chain Capital Assets	The sum of the costs associated with managing integrated supply chain assets.	sEP.5: Manage Integrated Supply Chain Capital Assets
CO.3.72	Cost to Manage Integrated Supply Chain Inventory	The sum of the costs associated with managing the integrated supply chain inventory.	sEP.4: Manage Integrated Supply Chain Inventory
CO.3.73	Cost to Manage Integrated Supply Chain Transportation	The sum of the costs associated with managing integrated supply chain transportation.	sEP.6: Manage Integrated Supply Chain Transportation
CO.3.74	Cost to Manage MAKE Equipment and Facilities	The sum of the costs associated with managing Make equipment and facilities.	sEM.5: Manage Make Equipment and Facilities

Metric ID	Metric Name	Metric Definition	Process
CO.3.75	Cost to Manage MAKE Information	The sum of the Cost to Manage MAKE Information	sEM.3: Manage Make Information
CO.3.76	Cost to Manage MAKE Regulatory Compliance	The sum of the Cost to Manage MAKE Regulatory Compliance	sEM.8: Manage Make Regulatory Environment
CO.3.77	Cost to Manage Performance of Return Processes	The sum of the costs to Manage Performance of Return Processes.	sER.2: Manage Performance of Return Processes
CO.3.78	Cost to Manage Performance of Supply Chain	The sum of the costs associated with assessing supplier performance.	sEP.2: Manage Performance of Supply Chain
CO.3.79	Cost to Manage PLAN Data Collection	The sum of the costs to Manage PLAN Data Collection.	sEP.3: Manage Plan Data Collection
CO.3.80	Cost to Manage Plan Regulatory Requirements and Compliance	The sum of the costs to Manage Plan Regulatory Requirements and Compliance.	sEP.8: Manage Plan Regulatory Requirements and Compliance
CO.3.81	Cost to Manage Planning Configuration	The sum of the Cost to Manage Planning Configuration	sEP.7: Manage Planning Configuration
CO.3.82	Cost to Manage Product Inventory	The sum of the Cost to Manage Product Inventory	sES.4: Manage Product Inventory
CO.3.83	Cost to Manage Product Life Cycle	The sum of the Cost to Manage Product Life Cycle	sED.7: Manage Product Life Cycle
CO.3.84	Cost to Manage Production Network	The sum of the costs to manage the production network	sEM.7: Manage Production Network
CO.3.85	Cost to Manage Production Performance	The sum of the costs to manage production performance.	sEM.2: Manage Production Performance
CO.3.86	Cost to Manage Production Rules	The sum of the costs to manage production rules.	sEM.1: Manage Production Rules
CO.3.87	Cost to Manage Return Capital Assets	The sum of the costs to manage the capital assets associated with returns.	sER.5: Manage Return Capital Assets
CO.3.88	Cost to Manage Return Data Collection	The sum of the costs to manage the capital assets associated with returns data collection.	sEM.1: Manage Production Rules
CO.3.89	Cost to Manage Return Inventory	The sum of the costs to manage the capital assets associated with return inventory.	sER.4: Manage Return Inventory

Metric ID	Metric Name	Metric Definition	Process
CO.3.90	Cost to Manage Return Network Configuration	The sum of the costs to manage the capital assets associated with configuring the return network.	sER.7: Manage Return Network Configuration
CO.3.91	Cost to Manage Return Regulatory Requirements and Compliance	The sum of the costs associated with managing compliance to return regulatory requirements.	sER.8: Manage Return Regulatory Requirements and Compliance
CO.3.92	Cost to Manage Return Transportation	The sum of the costs associated with managing return transportation.	sER.6: Manage Return Transportation
CO.3.93	Cost to Manage Source Capital Assets	The sum of the Costs to Manage Source Capital Assets	sES.5: Manage Capital Assets
CO.3.94	Cost to Manage Sourcing Business Rules	The sum of the costs associated with Source business rules.	sES.1: Manage Sourcing Business Rules
CO.3.95	Cost to Manage Supplier Agreements	The sum of the costs associated with managing supplier agreements.	sES.10: Manage Supplier Agreements
CO.3.96	Cost to Manage Supplier Network	The sum of the costs associated with managing the supplier network.	sES.7: Manage Supplier Network
CO.3.97	Cost to Manage Transportation	The sum of the costs associated with managing Finished Good Transportation	sEM.6: Manage Transportation (WIP) sED.6: Manage Transportation
CO.3.98	Cost to Negotiate & Receive Contract	The sum of the costs associated with negotiating and receiving contracts	sD3.2: Negotiate and Receive Contract
CO.3.99	Cost to Obtain & Respond to Request for Quote (RFQ) / Request for Proposal (RFP)	The sum of the costs associated with obtaining and responding to Request for Quote (RFQ) / Request for Proposal (RFP).	sD3.1: Obtain and Respond to RFP/ RFQ
CO.3.100	Cost to Pack Product	The sum of the costs associated with product packaging.	sD1.10: Pack Product sD2.10: Pack Product sD3.10: Pack Product
CO.3.101	Cost to Package	The sum of the costs associated with product packaging.	sM1.4: Package sM2.4: Package sM3.5: Package
CO.3.102	Cost to Pick Product	The sum of the costs associated with picking product.	sD1.9: Pick Product sD2.9: Pick Product sD3.9: Pick Product
CO.3.103	Cost to Pick Product from Backroom	The sum of the costs associated with picking product from backroom.	sD4.3: Pick Product from Backroom

Metric ID	Metric Name	Metric Definition	Process
CO.3.104	Cost to Plan Deliver	The sum of the costs associated with planning the delivery of product.	sP4: Plan Deliver
CO.3.105	Cost to Plan Make	The sum of the costs associated with planning the making of product.	sP3: Plan Make
CO.3.106	Cost to Plan Return	The sum of the costs associated with planning the returning of product.	sP5: Plan Return
CO.3.107	Cost to Plan Source	The sum of the costs associated with planning source activities.	sP2: Plan Source
CO.3.108	Cost to Plan Supply Chain	The sum of the costs associated with planning supply chain activities.	sP1: Plan Supply Chain
CO.3.109	Cost to Process Inquiry & Quote	The sum of the costs associated with processing inquiry and quotes.	sD1.1: Process Inquiry and Quote sD2.1: Process Inquiry and Quote
CO.3.110	Cost to Produce and Test	The sum of the costs associated with production and test.	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test
CO.3.111	Cost to Receive & Verify Product by Customer	The sum of the costs associated with receipt and verification at customer site.	sD1.13: Receive and Verify Product by Customer sD2.13: Receive and Verify Product by Customer sD3.13: Receive and Verify Product by Customer
CO.3.112	Cost to Receive Defective Product	The sum of the costs associated with receiving defective product returns.	sDR1.3: Receive Defective Product
CO.3.113	Cost to Receive Excess Product	The sum of the costs associated with receiving excess returns.	sDR3.3: Receive Excess Product
CO.3.114	Cost to Receive MRO Product	The sum of the costs associated with receiving MRO product returns.	sDR2.3: Receive MRO Product
CO.3.115	Cost to Receive Product	The sum of the costs associated with receiving product.	sS1.2: Receive Product sS2.2: Receive Product sS3.4: Receive Product
CO.3.116	Cost to Receive Product at Store	The sum of the costs associated with receiving product at the store.	sD4.2: Receive Product at the Store
CO.3.117	Cost to Receive Product from Source or Make	The sum of the costs associated with transferring product from source or make activities.	sD1.8: Receive Product from Source or Make sD2.8: Receive Product from Source or Make sD3.8: Receive Product from Source or Make
CO.3.118	Cost to Receive, Enter & Validate Order	The sum of the costs associated with receiving, entering and validating a customer order.	sD1.2: Receive, Enter and Validate Order sD2.2: Receive, Configure, Enter and Validate Order

Metric ID	Metric Name	Metric Definition	Process
CO.3.119	Cost to Release Finished Product to Deliver	The sum of the costs associated with releasing finished goods to deliver processes.	sM1.6: Release Product to Deliver sM2.6: Release Finished Product to Deliver sM3.7: Release Product to Deliver
CO.3.120	Cost to Reserve Resources & Determine Delivery Date	The sum of the costs associated with reserving resources and determining a delivery date.	sD1.3: Reserve Inventory and Determine Delivery Date sD2.3: Reserve Inventory and Determine Delivery Date
CO.3.121	Cost to Route Shipments	The sum of the costs associated with routing shipments.	sD1.6: Route Shipments sD2.6: Route Shipments sD3.6: Route Shipments
CO.3.122	Cost to Schedule Defective Product Receipt	The sum of the costs associated with scheduling defective product receipt.	sDR1.2: Schedule Defective Return Receipt
CO.3.123	Cost to Schedule Excess Product Receipt	The sum of the costs associated with scheduling excess product receipt.	sDR3.2: Schedule Excess Return Receipt
CO.3.124	Cost to Schedule Installation	The sum of the costs associated with scheduling product installation.	sD3.4: Schedule Installation
CO.3.125	Cost to Schedule MRO Product Receipt	The sum of the costs associated with scheduling MRO product receipt.	sDR2.2: Schedule MRO Return Receipt
CO.3.126	Cost to Schedule Product Deliveries	The sum of the costs associated with scheduling product deliveries.	sS1.1: Schedule Product Deliveries sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries
CO.3.127	Cost to Schedule Production Activities	The sum of the costs associated with scheduling production activities.	sM1.1: Schedule Production Activities sM2.1: Schedule Production Activities sM3.2: Schedule Production Activities
CO.3.128	Cost to Select Carriers & Rate Shipments	The sum of the costs associated with selecting carriers and rating shipments.	sD1.7: Select Carriers and Rate Shipments sD2.7: Select Carriers and Rate Shipments sD3.7: Select Carriers & Rate Shipments
CO.3.129	Cost to Select Final Supplier(s) and Negotiate	The sum of the costs associated with selecting final suppliers and negotiating supplier agreements.	sS3.2: Select Final Supplier (S) and Negotiate
CO.3.130	Cost to Ship Product	The sum of the costs associated with shipping products.	sD1.12: Ship Product sD2.12: Ship Product sD3.12: Ship Product

Metric ID	Metric Name	Metric Definition	Process
CO.3.131	Cost to Source Return	The sum of the costs associated with SourceReturn	sSR1: Source Return Defective Product sSR3: Source Return Excess Product
CO.3.132	Cost to Stage Finished Product	The sum of the costs associated with staging finished goods.	sM1.5: Stage Product sM2.5: Stage Finished Product sM3.6: Stage Finished Product
CO.3.133	Cost to Stock Shelf	The sum of the costs associated with stocking shelves.	sD4.4: Stock Shelf
CO.3.134	Cost to Transfer Defective Product	The sum of the costs associated transferring defective product for disposition	sDR1.4: Transfer Defective Product
CO.3.135	Cost to Transfer Excess Product	The sum of the costs associated transferring excess product for disposition	sDR3.4: Transfer Excess Product
CO.3.136	Cost to Transfer MRO Product	The sum of the costs associated transferring MRO product for disposition	sDR2.4: Transfer MRO Product
CO.3.137	Cost to Transfer Product	The sum of the costs associated with transferring product to Make or Deliver processes	sS1.4: Transfer Product sS2.4: Transfer Product sS3.6: Transfer Product
CO.3.138	Cost to Verify Product	The sum of the costs associated with raw material verification.	sS1.3: Verify Product sS2.3: Verify Product sS3.5: Verify Product
CO.3.139	Customer Invoicing/ Accounting Costs	Includes costs for invoicing, processing customer payments, and verifying customer satisfaction.	sD1.15: Invoice, sD2.15: Invoice, sD3.15: Invoice
CO.3.140	Direct labor cost	Direct cost spent on production labor	sEM.2: Manage Production Performance
CO.3.141	Direct material cost	Direct cost spent on material for production	sEM.2: Manage Production Performance
CO.3.142	Distribution Costs	The costs of distribution (warehousing and transportation of finished goods) as a percent of total supply chain costs	sP4.4: Establish Delivery Plans
CO.3.143	Energy consumption	The energy consumed by the Make process per unit produced.	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test sP3: Plan Make
CO.3.144	Energy Cost per Unit	The cost of energy inputs for the Make process per unit produced.	sP3: Plan Make

Metric ID	Metric Name	Metric Definition	Process
CO.3.145	Energy Costs	the cost of energy inputs to S1.4 as a percent of total product transfer and storage costs.	sS1.4: Transfer Product sS2.4: Transfer Product sS3.6: Transfer Product sM2: Make-to- Order sD2: Deliver Make-to-Order Product sD1.6: Route Shipments sD2.6: Route Shipments sD3: Deliver Engineer-to-Order Products sDR1.3: Receive Defective Product sDR2.4: Transfer MRO Product sDR3.2: Schedule Excess Return Receipt
CO.3.146	Energy efficient upgrades	The percent of new equipment purchased over the past year that is more energy efficient than the equipment it replaces	sEM.5: Manage Make Equipment and Facilities
CO.3.147	Environmental Compliance Cost	The cost of complying with environmental regulations and policies as a percent of total supply chain costs.	sP1: Plan Supply Chain sEP.8: Manage Plan Regulatory Requirements and Compliance
CO.3.148	Environmental non-compliance cost	The cost impact of compliance violations with environmental regulations and policies as a percent of total supply chain costs.	sEP.8: Manage Plan Regulatory Requirements and Compliance
CO.3.150	Excess product disposition costs as % total Source cost	Excess product disposition costs as % total Source cost	sSR3.2: Disposition Excess Product

Metric ID	Metric Name	Metric Definition	Process
CO.3.152	Gross Risk (\$)	The total unmitigated risk for a specific area, supplier, product, etc.(\$)	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
CO.3.153	Hazardous waste generated at warehousing facilities as % of total waste generated	The weight of hazardous waste generated from warehousing operations as a percent of the total waste generated	sM1.3: Produce and Test sM3.4: Produce and Test sES.4: Manage Product Inventory
CO.3.154	Hedge Rating (Inventory DOS for risk management)	The amount of inventory in use as a risk mitigation tactic (DOS)	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
CO.3.155	Indirect cost related to production	Indirect cost incurred in production indirectly	sEM.2: Manage Production Performance
CO.3.157	Industry Benchmark Comparison (%)	Industry Benchmark Comparison (%) For example: the benchmark for mitigation plans implemented is 60% and you are at 50%. You are at 83% of the benchmark.	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk

Metric ID	Metric Name	Metric Definition	Process
CO.3.158	Mitigated Risk (\$)	The total mitigated risk for a specific area, supplier, product, etc.(\$)	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
CO.3.159	Mitigation cost by Event (\$)	The cost of mitigation for a specific risk event (\$)	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
CO.3.160	MRO Disposition Costs As % Total Source cost	MRO Disposition Costs As % Total Source cost	sSR2.2: Disposition MRO Product
CO.3.161	NPDES permitted water effluent	The weight of water pollutant emitted per weight of finished good produced	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test
CO.3.162	Number of worker absences due to poor IAQ	The annual hours of worker absences that can be attributed to indoor air quality issues	sES.4: Manage Product Inventory sEM.5: Manage Make Equipment and Facilities
CO.3.163	Order Management Costs	The aggregation of the following cost elements (contained in this glossary):	sD1: Deliver Stocked Products sD3: Deliver Engineer-to-Order Products
CO.3.164	Packaging material re-use	The percent of packaging materials that are reused	sM1.4: Package sM3.5: Package sES.4: Manage Product Inventory
CO.3.165	Packaging purchases	The cost of packaging materials used during transfer operations	sS1.4: Transfer Product
CO.3.166	Packaging volume	Total volume of packaging material per unit divided by total unit volume	sEM.6: Manage Transportation (WIP)
CO.3.167	Peak Time Energy Use	% of total energy consumption that occurs during regional peak demand times	sM2.1: Schedule Production Activities sM1.1: Schedule Production Activities
CO.3.168	Pollution Prevention Ratio	Compliance costs directed to pollution prevention activities as a percent of total compliance costs.	sEM.8: Manage Make Regulatory Environment

Metric ID	Metric Name	Metric Definition	Process
CO.3.169	Product Acquisition Costs	Product acquisition costs include costs incurred for the production of product: sum of product management and planning, supplier quality engineering, inbound freight and duties, receiving and product storage, incoming inspection, product process engineering and tooling costs.	sS1: Source Stocked Product sS2: Source Make-to-Order Product sS3: Source Engineer-to-Order Product
CO.3.170	Product Packaging costs	The cost of material and labor to package items for transfer divided by the number of items transferred	sS1.4: Transfer Product
CO.3.171	Product Shipped per delivery	The average number of units transferred per vehicle	sD1.5: Build Loads sD2.5: Build Loads sD3.5: Build Loads
CO.3.172	Quantity per shipment	The average number of units transferred per vehicle	sS1.1: Schedule Product Deliveries sS1.4: Transfer Product sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries sM1.2: Issue Material sM2.2: Issue Sourced/In-Process Product sM3.3: Issue Sourced/In-Process Product sD1.5: Build Loads sD2.5: Build Loads
CO.3.173	Ratio of Authorization Cost To Total Source Cost	Ratio of Authorization Cost To Total Source Cost	sSR3.3: Request Excess Product Return Authorization
CO.3.174	Ratio of Authorization Cost to Total Source Return cost	Ratio of Authorization Cost to Total Source Return cost	sSR2.3: Request MRO Return Authorization
CO.3.175	Ratio of authorization costs to total source return cost	Ratio of authorization costs to total source return cost	sSR1.3: Request Defective Product Return Authorization

Metric ID	Metric Name	Metric Definition	Process
CO.3.176	Residual Risk (\$)	The residual (gross – mitigated) risk for a specific area, supplier, product, etc.(\$)	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
CO.3.177	Return transportation costs	Sum of the costs associated with return transportation	sSR1.5: Return Defective Product sSR2.5: Return MRO Product sSR3.5: Return Excess Product
CO.3.178	Risk Mitigation Costs (Deliver)	The total supply chain risk mitigation cost of all DELIVER mitigation actions for a specific area, supplier, product, etc. (\$)	sED.9: Manage Supply Chain Deliver Risk
CO.3.179	Risk Mitigation Costs (Make)	The total supply chain risk mitigation cost of all MAKE mitigation actions for a specific area, supplier, product, etc. (\$)	sEM.9: Manage Supply Chain Make Risk
CO.3.180	Risk Mitigation Costs (Plan)	The total supply chain risk mitigation cost of all PLAN mitigation actions for a specific area, supplier, product, etc. (\$)	sEP.9: Manage Supply Chain Plan Risk
CO.3.181	Risk Mitigation Costs (Return)	The total supply chain risk mitigation cost of all RETURN mitigation actions for a specific area, supplier, product, etc. (\$)	sER.9: Manage Supply Chain Return Risk
CO.3.182	Risk Mitigation Costs (Source)	The total supply chain risk mitigation cost of all SOURCE mitigation actions for a specific area, supplier, product, etc. (\$)	sES.9: Manage Supply Chain Source Risk
CO.3.183	Scrap packaging expense	The cost of packaging material that is scrapped as part of the packaging process	sM1.4: Package sM2.4: Package sM3.5: Package
CO.3.184	Supply / Customer / Product Base Rated (%)	The percent of the assessed area (suppliers, customers, etc.) that has been systematically evaluated.	sEP.9: Manage Supply Chain Plan Risk sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
CO.3.185	Total Deliver Costs	The sum of the costs associated with the Deliver processes.	sP4: Plan Deliver

Metric ID	Metric Name	Metric Definition	Process
CO.3.186	Total Excess Material Return Costs	The sum of the costs associated with the receipt of returned excess products from the customer	sSR3: Source Return Excess Product
CO.3.187	Total Source Return Costs	The sum of the costs associated with the return of raw materials to the supplier.	sSR2: Return MRO Product
CO.3.188	Transportation Costs	The costs of transportation per unit shipped	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements
CO.3.195	Warehouse energy costs	The cost of energy inputs for warehouse operations as a % of total storage costs	sES.4: Manage Product Inventory
CO.3.196	Warehousing solid waste	The annual weight of waste generated from warehousing processes	sES.4: Manage Product Inventory
CO.3.197	Waste produced as % of product produced	The weight of waste (air, liquid and solid) divided by the weight of finished goods product produced.	sM1.3: Produce and Test sM2.3: Produce and Test
CO.3.198	Waste storage costs as % of Make costs	The cost to store and manage production waste as a per cent of total Make costs	sM1.7: Waste Disposal sM2.7: Waste Disposal sM3.8: Waste Disposal
CO.3.199	Water use reduction	The annual % reduction in water use per warehousing cost	sES.4: Manage Product Inventory

Cash-to-Cash Cycle Time

The time it takes for an investment made to flow back into a company after it has been spent for raw materials. For services, this represents the time from the point where a company pays for the resources consumed in the performance of a service to the time that the company received payment from the customer for those services.

Qualitative Relationship Description

The longer the cash-to-cash cycle, the more current assets needed (relative to current liabilities) since it takes longer to convert inventories and receivables into cash. In other words, the longer the cash-to-cash cycle, the more net working capital required.

Quantitative Relationship (optional, if calculable)

The Cash-to-Cash Cycle time is measured by converting into days the supply of inventory in stock and the number of days outstanding for accounts receivable and accounts payable. The inventory days of supply is added to the days outstanding for accounts receivable. The accounts payable days outstanding is subtracted from this total to determine the cash-to-cash cycle time.

Calculation

Cash-to-Cash Cycle Time = Inventory Days of Supply + Days Sales Outstanding – Days Payable Outstanding

Level 2 Metrics:

AM.2.2 Inventory Days of Supply = the amount of inventory (stock) expressed in days of sales. The [5 point rolling average of gross value of inventory at standard cost] / [annual cost of goods sold (COGS) / 365]

Example: If 2 items a day are sold and 20 items are held in inventory, this represents 10 days' (20/2) sales in inventory.

(Other names: Days cost-of-sales in inventory, Days' sales in inventory)

AM.2.1 Days Sales Outstanding = the length of time from when a sale is made until cash for it is received from customers. The amount of sales outstanding expressed in days. The [5 point rolling average of gross accounts receivable (AR)] / [total gross annual sales / 365].

Example: If \$5000 worth of sales were made per day and \$50,000 worth of sales were outstanding, this would represent 10 days' (\$50,000/\$5000) of sales outstanding.

(Other names: Days sales in Accounts receivables)

AM.2.3 Days Payable Outstanding = the length of time from purchasing materials, labor and/ or conversion resources until cash payments must be made expressed in days. The [5 point rolling average of gross accounts payable (AP)] / [total gross annual material purchases / 365].

(Other names: Average payment period for materials, Days purchases in accounts payable, Days'

AM.1.1

Calculation cont.

The “5 point rolling average” calculation uses a combination of both historical and forward-looking data. This means that the rolling average value has to be calculated based on the average over the four previous quarters and the projection for the current or next quarter.

The 5 point rolling average calculation is:

[Sum of the 4 previous quarters + projection for next quarter) / 5]

Data Collection

Unlike the other SCOR attributes, where data requirements are specified, typically all of the cash-to-cash cycle time source data is already captured by business operating systems:

- general ledger system
- accounts receivable system
- accounts payable system
- purchasing system
- production reporting system
- customer relationship management system

As a result, information is ‘calculated’ by importing data from these systems and transforming them into the prescribed analytics/information. The transformation is accomplished using business rules.

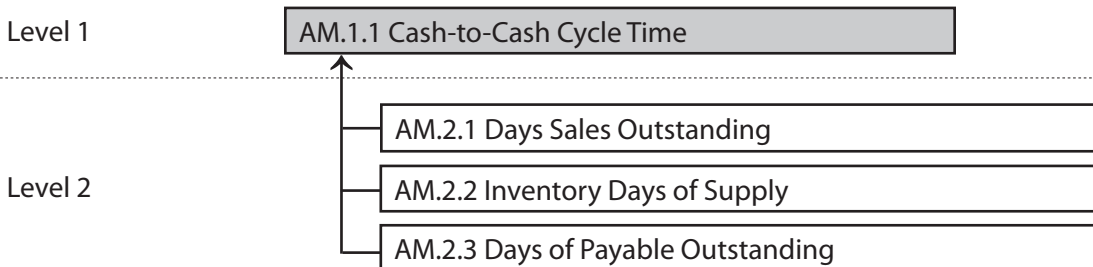
Discussion

Cash-to-cash Cycle Time is a value metric used to measure how efficiently a company manages its working capital assets.

This metric is a generally accepted Supply Chain metric within many industries and is used to benchmark supply chain asset management performance.

The term “5 point annual average” can be confusing in that it can imply a measure over a year’s period of time when the data points are taken over 5 quarters. The intent of the approach is to smooth the seasonal peaks and valleys over time and to balance projected data with historical data. The measurement can be taken quarterly or at any given consistent time frame.

Hierarchical Metric Structure



Return on Supply Chain Fixed Assets

Return on Supply Chain Fixed Assets measures the return an organization receives on its invested capital in supply chain fixed assets. This includes the fixed assets used in Plan, Source, Make, Deliver, and Return.

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

The return on supply chain fixed assets is measured by monetizing the supply chain revenue, cost of goods sold and supply chain management costs to determine the profit from the respective supply chain. This amount is divided by the supply chain fixed assets to determine the return generated from the respective supply chain.

Calculation

Return on Supply Chain Fixed Assets = (Supply Chain Revenue – COGS – Supply Chain Management Costs) / Supply-Chain Fixed Assets

“Supply Chain Revenue” is used in the metric rather than just Net Revenue.

There is a need for a more specific “revenue” number than “Net Revenue” for use in the “Supply Chain Revenue” level 2 metric. Net Revenue could include revenue from sources other than the supply chain, such as investments, leasing real estate, court settlements, etc... Supply Chain Revenue will be used and will be only the portion of Net Revenue that is generated by the specific supply chain being measured and analyzed.

Level 2 Metrics

Supply-Chain Revenue

Operating revenue generated from a supply chain. This does not include non-operating revenue, such as leasing real estate, investments, court settlements, sale of office buildings, etc...

CO.1.2 COGS (Cost of Goods Sold)

Calculation - Refer to the section for COGS in the Attribute for Costs.

CO.1.1 Total Supply Chain Management Costs

Calculation - refer to the section for Supply-Chain Management Costs in the Attribute for Costs.

AM.2.5 Supply Chain Fixed Assets

Source Fixed Asset Value +
 Make Fixed Asset Value +
 Deliver Fixed Asset Value +
 Return Fixed Asset Value +
 Plan Fixed Asset Value

Calculation cont.

Level 3 Metrics

Plan Fixed Asset Value- The current value of the supply chain assets used in supply chain integration (See sEP.5)

Source Fixed Asset Value - The current value of the supply chain assets used in the Source process. (See sES.5)

Make Fixed Asset Value- The current value of the supply chain assets used in the Make process. (See sEM.5)

Deliver Fixed Asset Value - The current value of the supply chain assets used in the Deliver process. (See sED.5)

Return Fixed Asset Value - The current value of the supply chain assets used in the Return process. (See sER.5)

A Revised Capital Plan is an output of the Manage Integrated Supply Chain Fixed Assets (sEP.5) process element and would contain supply chain capital asset information that could be used in measuring the Supply Chain Fixed Assets.

Data Collection

Unlike the other SCOR attributes, where data requirements are specified, typically all of the return on working capital's source data is already captured by business operating systems:

- general ledger system
- fixed asset system
- purchasing system
- labor reporting system
- production reporting system
- customer relationship management system

As a result, information is 'calculated' by importing data from these systems and transforming them into the prescribed analytics/information. The transformation is accomplished using business rules.

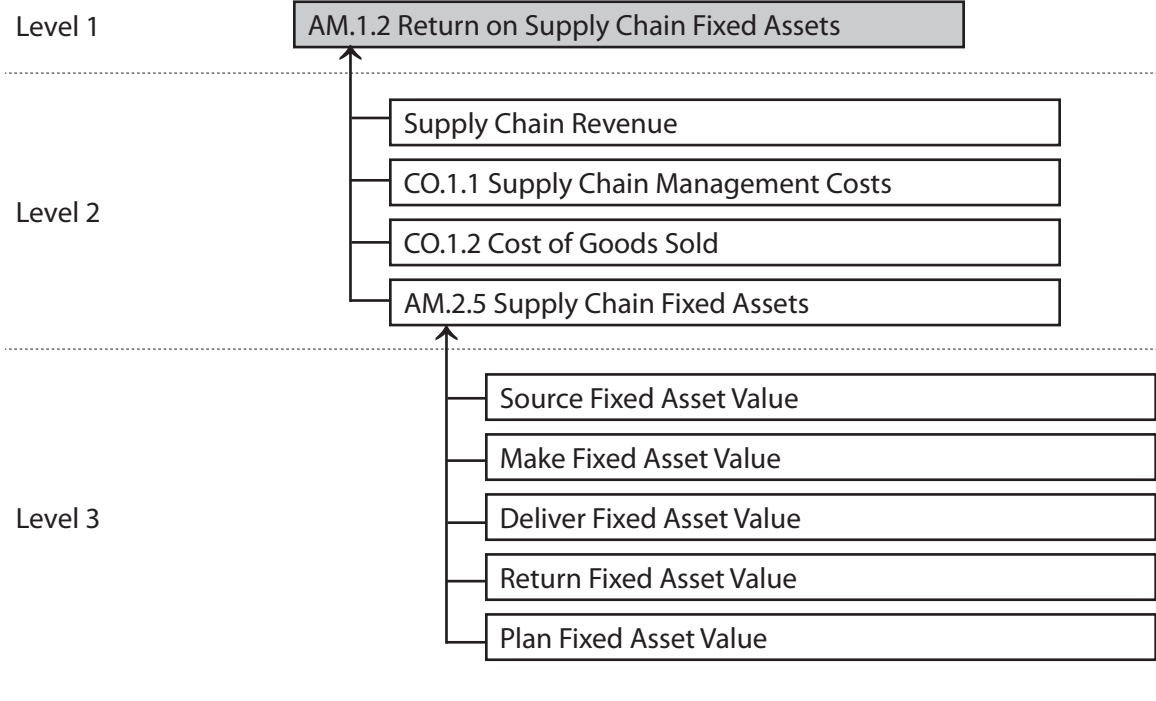
In order to measure Return on Supply Chain Fixed Assets, the investment in supply chain capital assets needs to be known. This requires a clear understanding of what is a "supply chain fixed asset". SCOR Ex.5 process elements were used since these are all focused on managing SC capital assets. It is the assets managed in these Enable processes that comprise Supply Chain Fixed Assets. The value of these assets is the denominator of the metric.

Discussion

Range of fixed assets used in an organization that have the character of permanency rather than being rapidly replaced (or expensed); examples include land, warehouse, trucks, buildings, investments, and plant and machinery.

Fixed assets used to operate the Supply Chain in each of the categories (sP, sS, sM, sD, sR) are tracked within the Ex.5 process elements. A Revised Capital Plan is an output of the Manage Integrated Supply Chain Fixed Assets (sEP.5) process element and would contain supply chain capital asset information that could be used in measuring the Supply Chain Fixed Asset Value.

Hierarchical Metric Structure



AM.1.3

Return on Working Capital

Return on working capital is a measurement which assesses the magnitude of investment relative to a company's working capital position versus the revenue generated from a supply chain. Components include accounts receivable, accounts payable, inventory, supply chain revenue, cost of goods sold and supply chain management costs. (Processes: sP1, sP2, sP3, sP4, sS1, sS2, sS3, sM1, sM2, sM3, sD1, sD2, sD3, sD4)

Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

The return on working capital is measured by monetizing the supply chain profit and dividing into the calculated amount the supply chain working capital position.

Calculation

Return on Working Capital = (Supply Chain Revenue – COGS – Supply Chain Management Costs) / (Inventory + Accounts Receivable – Accounts Payable)

Level 2 Metrics:

Supply-Chain Revenue

Operating revenue generated from a supply chain. This does not include non-operating revenue, such as leasing real estate, investments, court settlements, sale of office buildings, etc...

CO.1.2 COGS (Cost of Goods Sold)

Calculation - Refer to the section for COGS in the Attribute for Costs.

CO.1.1 Total Supply Chain Management Costs

Calculation - refer to the section for Supply-Chain Management Costs in the Attribute for Costs.

AM.2.8 Inventory = the amount of inventory (stock) expressed in dollars. The [5 point rolling average of gross value of inventory at standard cost]

AM.2.7 Sales Outstanding = the amount of **accounts receivable** outstanding expressed in dollars. The [5 point rolling average of gross accounts receivable (AR)]

AM.2.6 Payables Outstanding = expressed in dollars, the amount of purchased materials, labor and/or conversion resources that are to be paid (**accounts payable**). The [5 point rolling average of gross accounts payable (A/P)]

The "5 point rolling average" calculation uses a combination of both historical and forward-looking data. This means that the rolling average value has to be calculated based on the average over the four previous quarters and the projection for the current or next quarter.

The 5 point rolling average calculation is: [Sum of the 4 previous quarters + projection for next quarter) / 5]

Calculation cont.**Level 3 Metrics**

Plan Fixed Asset Value- The current value of the supply chain assets used in supply chain integration (See sEP.5)

Source Fixed Asset Value - The current value of the supply chain assets used in the Source process. (See sES.5)

Make Fixed Asset Value- The current value of the supply chain assets used in the Make process. (See sEM.5)

Deliver Fixed Asset Value - The current value of the supply chain assets used in the Deliver process. (See sED.5)

Return Fixed Asset Value - The current value of the supply chain assets used in the Return process. (See sER.5)

A Revised Capital Plan is an output of the Manage Integrated Supply Chain Fixed Assets (sEP.5) process element and would contain supply chain capital asset information that could be used in measuring the Supply Chain Fixed Assets.

Data Collection

Unlike the other SCOR attributes, where data requirements are specified, typically all of the return on working capital's source data is already captured by business operating systems:

- general ledger system
- accounts receivable system
- accounts payable system
- purchasing system
- labor reporting system
- production reporting system
- customer relationship management system

As a result, information is 'calculated' by importing data from these systems and transforming them into the prescribed analytics/information. The transformation is accomplished using business rules.

Discussion

"Supply Chain Revenue" is used in the metric rather than just Net Revenue. There is a need for a more specific "revenue" number than "Net Revenue" for use in the "Supply Chain Revenue" level 2 metric. Net Revenue could include revenue from sources other than the supply chain, such as investments, leasing real estate, court settlements, etc... Supply Chain Revenue will be used and will be only the portion of Net Revenue that is generated by the specific supply chain being measured and analyzed.

AM.1.3

Hierarchical Metric Structure

Level 1

AM.1.3 Return on Working Capital

Level 2

CO.1.1 Supply Chain Management Costs

CO.1.2 Cost of Goods Sold

AM.2.6 Accounts Payable (Payables Outstanding)

AM.2.7 Accounts Receivable (Sales Outstanding)

AM.2.8 Inventory

Supply Chain Revenue

Level 3 Asset Management Metrics

Metric ID	Metric Name	Metric Definition	Process
AM.3.1	% of hazardous material in inventory	The weight of hazardous material in inventory as a percent of total inventory weight	sED.4: Manage Finished Goods Inventories
AM.3.2	% of material that has a valid "Take-back" program	% of the product content that has a supplier take-back program for recycling or reuse.	sS3.1: Identify Sources of Supply
AM.3.3	% of materials that are recyclable/ reusable	% of the product content that is recyclable or reusable	sS3.1: Identify Sources of Supply
AM.3.4	% of packaging/shipping materials reused internally	The percent of scrap from packaging that is immediately reused in the packaging process	sM2.4: Package
AM.3.5	% of production materials reused	The percent of scrap from production that is immediately reused in the production process	sM3.4: Produce and Test sM1.3: Produce and Test sM2.3: Produce and Test
AM.3.6	% of products consisting of previously used components	the weight of recycled material in the product as a percent of total product weight	sM3.4: Produce and Test sM1.3: Produce and Test sM2.3: Produce and Test
AM.3.7	Actual Asset Life Maintenance Cost as % of Replacement Value	Measure of total lifecycle maintenance cost of an asset compared to its replacement cost. This ratio is based maintenance cost to-date so that that replacement or upgrade cost can be evaluated as the asset ages on an on-going basis.	sEM.5: Manage Make Equipment and Facilities
AM.3.8	Average age of Excess Inventory	Average age of Excess Inventory	sSR3: Source Return Excess Product
AM.3.9	Capacity Utilization	A measure of how intensively a resource is being used to produce a good or service. Some factors that should be considered are internal manufacturing capacity, constraining processes, direct labor availability and key components/materials availability.	sM3.4: Produce and Test sM1.3: Produce and Test sM2.3: Produce and Test sM1.4: Package sM2.4: Package sM3.5: Package sM1.1: Schedule Production Activities sM2.1: Schedule Production Activities sM3.2: Schedule Production Activities

Metric ID	Metric Name	Metric Definition	Process
AM.3.10	Defective product disposition costs as % total Source Return cost	Defective product disposition costs as % total Source Return cost	sER.2: Manage Performance of Return Processes
AM.3.11	Deliver Fixed Asset Value	Deliver Fixed Asset Value - The current value of the supply chain assets used in the Deliver process.	sED.5: Manage Deliver Capital Assets
AM.3.12	Deliver Return Cycle Time	The average time associated with returns.	sDR1: Deliver Return Defective Product sDR2: Deliver Return MRO Product
AM.3.13	Equipment energy efficiency	The number of capital equipment units that meet energy efficiency standards as a per cent of total capital equipment units	sEM.5: Manage Make Equipment and Facilities
AM.3.14	Hazardous materials used during production process as a % of all materials	The % of material (by weight) issued for production that is classified as hazardous material	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test
AM.3.15	Hazardous waste as % of total waste	The % of waste (by weight) generated from production that is classified as hazardous material	sM1.7: Waste Disposal sM2.7: Waste Disposal sM3.8: Waste Disposal
AM.3.16	Inventory Days of Supply (Raw Material)	Value of raw materials ÷ (COGS ÷ 365).	sS1: Source Stocked Product sS2: Source Make-to-Order Product sS3: Source Engineer-to-Order Product
AM.3.17	Inventory Days of Supply (WIP)	Total value of Work in Process ÷ (COGS ÷ 365).	sM2: Make-to- Order sM3: Engineer-to-Order
AM.3.18	Make Fixed Asset Value	The current value of the supply chain assets used in the Make process	sEM.5: Manage Make Equipment and Facilities
AM.3.19	Packaging as % of total material	The % by weight of packaging material to total raw material weight	sM1.2: Issue Material sM2.2: Issue Sourced/In-Process Product sM3.3: Issue Sourced/In-Process Product sEM.6: Manage Transportation (WIP)
AM.3.20	Plan Fixed Asset Value	The current value of the supply chain assets used in supply chain integration	sEP.5: Manage Integrated Supply Chain Capital Assets

Metric ID	Metric Name	Metric Definition	Process
AM.3.21	Rebuild or recycle rate	Number of returned products that are rebuilt or recycled as a percent of the total number of products returned	sSR1: Source Return Defective Product sSR1.5: Return Defective Product sSR2: Return MRO Product
AM.3.22	Recyclable waste as % of total waste	The % of waste (by weight) generated from production that is recyclable	sM1: Make-to-stock sM2: Make-to- Order sM3: Engineer-to-Order
AM.3.23	Recycle DOS	Days of supply of recyclable inventory awaiting processing	sER.4: Manage Return Inventory
AM.3.24	Return Fixed Asset Value	The current value of the supply chain assets used in the Return process	sER.5: Manage Return Capital Assets
AM.3.25	Return for Recycle Rate	Number of returns that are for recycling or re use as a per cent of the total number of products returned	sDR3: Deliver Return Excess Product
AM.3.26	Return Rate	Weight of products returned divided by the weight of product shipped	sDR1: Deliver Return Defective Product
AM.3.27	Source Fixed Asset Value	The current value of the supply chain assets used in the Source process	sES.5: Manage Capital Assets
AM.3.28	Percentage of defective inventory	The value of defective product inventory as a percentage of the value of total inventory (%). [Total Defective Product Inventory Value] / [Total Inventory Value] x 100%	sDR1: Deliver Return Defective Product
AM.3.29	Percentage of Defective Inventory in Disposition	The value of defective product awaiting a disposition decision as a percentage of the value of the total defective product inventory (%). [Value of Defective Inventory in Disposition Stage] / [Total Inventory Value] x 100%	sSR1.1: Identify Defective Product Condition sSR1.2: Disposition Defective Product sSR2.2: Disposition MRO Product
AM.3.30	Percentage of Defective Inventory in Return Authorization	The value of defective product awaiting return authorization as a percentage of the total defective product inventory value (%). [Value of Defective Product Inventory in Request Return Authorization Stage] / [Total Defective Product Inventory Value] x 100%	sSR1.3: Request Defective Product Return Authorization sDR1.1: Authorize Defective Product Return

Metric ID	Metric Name	Metric Definition	Process
AM.3.31	Percentage Defective Product Inventory in Transportation	The value of defective product inventory in transportation as a percentage of total defective product inventory (%). [Value of Defective Product Inventory in Physical Return and Transportation Stage] / [Total Defective Product Inventory Value] x 100%	sSR1.5: Return Defective Product
AM.3.32	Percentage Defective Product Inventory in Scheduling	The value of defective product inventory awaiting scheduling as a percentage of the total defective product inventory value (%). [Value of Defective Product in Scheduling Stage] / [Total Defective Product Inventory Value] x 100%	sSR1.4: Schedule Defective Product Shipment
AM.3.33	Percentage Excess Inventory in Disposition	Inventory awaiting return in the disposition decision stage. [Excess Inventory in Disposition Stage] / [Total Inventory Value] x 100%	sSR3.2: Disposition Excess Product
AM.3.34	Percentage Excess Inventory in Transportation	Excess process in physical return and transportation stage as a percentage of total excess product inventory (%). [Value of excess product inventory in physical return and transportation stage] / [Total excess inventory value] x 100%	sSR3.5: Return Excess Product
AM.3.35	Percentage Excess Inventory in Request Return Authorization	Inventory awaiting return authorization (%). [Value of excess product in request return authorization stage] / [Value of total excess inventory] x 100%	sSR3.3: Request Excess Product Return Authorization
AM.3.36	Percentage Excess Inventory in Identification	Inventory awaiting return in the identification stage as a percentage of total excess inventory (%). [Value of Excess Inventory in Identification Stage] / [Total Inventory Value] x 100%	sSR3.1: Identify Excess Product Condition
AM.3.37	Percentage Excess Inventory	The value of excess inventory as a percentage of the value of total inventory (%). [Value of Excess Inventory] / [Total Inventory Value] x 100%	sSR3: Source Return Excess Product

Metric ID	Metric Name	Metric Definition	Process
AM.3.38	Percentage Excess Inventory in Scheduling	Percentage of excess inventory awaiting scheduling the return (%) [Value of Excess Product Inventory In Scheduling Stage] / [Total Excess Product Inventory Value] x 100%	sSR3.4: Schedule Excess Product Shipment
AM.3.39	Percentage Unserviceable MRO Inventory in Disposition	The value of unserviceable MRO Inventory in disposition stage as a percentage of total MRO inventory value (%). [Value of Unserviceable MRO Inventory in Disposition Stage] / [Total MRO Inventory Value] x 100%	sSR2.2: Disposition MRO Product sDR2: Deliver Return MRO Product
AM.3.40	Percentage Unserviceable MRO Inventory in Transportation	The value of unserviceable MRO inventory in transportation as a percentage of the total MRO inventory value (%). [Value of Unserviceable MRO Inventory in Physical Return and Transportation Stage] / [Total MRO Inventory Value] x 100%	sSR2.5: Return MRO Product
AM.3.41	Percentage Unserviceable MRO Inventory in Return Authorization	The value of unserviceable MRO inventory awaiting return authorization as a percentage of the total MRO inventory value (%). [Value of Unserviceable MRO Inventory in Request Return Authorization Stage] / Total MRO Inventory Value] x 100%	sSR2.3: Request MRO Return Authorization
AM.3.42	Percentage Unserviceable MRO Inventory in Identification	The value of unserviceable MRO Inventory awaiting identification as a percentage of total MRO inventory value (%). [Value of Unserviceable MRO Inventory in Identification Stage] / [Total MRO Inventory Value] x 100%	sSR2.1: Identify MRO Product Condition
AM.3.43	Percentage Unserviceable MRO Inventory in Scheduling	The value of unserviceable MRO inventory awaiting scheduling as a percentage of the total MRO inventory value (%). [Value of Unserviceable MRO inventory in Scheduling Stage] / [Total MRO Inventory Value] x 100%	sSR2.4: Schedule MRO Shipment

Metric ID	Metric Name	Metric Definition	Process
AM.3.44	Percentage Unserviceable MRO Inventory	The percentage of the value of unserviceable MRO inventory as a percentage of total MRO inventory value (%). [Value of Unserviceable MRO Inventory in Deliver Return Process] / [Total MRO Inventory Value] x 100%	sER.4: Manage Return Inventory
AM.3.45	Finished Goods Inventory Days of Supply	Finished goods inventory days of supply are calculated as gross finished goods inventory ÷ (value of transfers/365 days).	sD1: Deliver Stocked Products sD2: Deliver Make-to-Order Product sD3: Deliver Engineer-to-Order Products sD.4: Manage Finished Goods Inventories

Section 3

Processes

Introduction to Processes

A process is a unique activity performed to meet pre-defined outcomes. The processes in SCOR have been identified as unique processes a supply chain requires to execute in order to support its primary objective to fulfill customer orders. For each unique process SCOR only has one representation †.

SCOR recognizes 5 major processes (level-1 processes):

Plan

The Plan processes describe the activities associated with developing plans to operate the supply chain. The Plan processes include the gathering of requirements, gathering of information on available resources, balancing requirements and resources to determine planned capabilities and gaps in demand or resources and identify actions to correct these gaps.

Source

The Source processes describe the ordering (or scheduling of deliveries) and receipt of goods and services. The Source process embodies the issuance of purchase orders or scheduling deliveries, receiving, validation and storage of goods and accepting the invoice from the supplier. With the exception for Sourcing Engineer-to-Order goods or services, all supplier identification, qualification and contract negotiation processes are not described using Source process elements. See DCOR (www.supply-chain.org/dcor).

Make

The Make processes describe the activities associated with the conversion of materials or creation of the content for services. Conversion of materials is used rather than 'production' or 'manufacturing' as Make represents all types of material conversions: Assembly, Chemical processing, Maintenance, Repair, Overhaul, Recycling, Refurbishment, Remanufacturing and other common names for material conversion processes. As a general guideline: These processes are recognized by the fact that 1 or more item numbers go in and 1 or more different item numbers come out of this process.

Deliver

The Deliver processes describe the activities associated with the creation, maintenance and fulfillment of customer orders. The Deliver process embodies the receipt, validation and creation of customer orders, scheduling order delivery, pick, pack and shipment and invoicing the customer. The D4 Deliver Retail process provides a simplified view of Source and Deliver processes operated in a Make-to-Stock-only retail operation.

Return

The Return processes describe the activities associated with the reverse flow of goods. The Return process embodies the identification of the need to return, the disposition decision making, the scheduling of the return and the shipment and receipt of the returned goods. Repair, recycling, refurbishment and remanufacturing processes are not described using Return process elements. See Make.

Processes

For each level-1 process 3 or more differentiating level-2 process categorizations exist. Each level-2 process contains level-3 process elements. These hierarchical relationships provide classification of processes.

† It is recognized that some processes are duplicated throughout the SCOR model. This includes processes: sD1.13, sD1.14, sD2.13, sD2.14, sD3.13, sD3.14, sD4.1 - sD4.7.

Plan

The processes associated with determining requirements and corrective actions to achieve supply chain objectives.

Process Categories	
sP1: Plan Supply Chain	The development and establishment of courses of action over specified time periods that represent a projected appropriation of supply chain resources to meet supply chain requirements for the longest time fence constraints of supply resources.
sP2: Plan Source	The development and establishment of courses of action over specified time periods that represent a projected appropriation of material resources to meet supply chain requirements.
sP3: Plan Make	The development and establishment of courses of action over specified time periods that represent a projected appropriation of production resources to meet production requirements.
sP4: Plan Deliver	The development and establishment of courses of action over specified time periods that represent a projected appropriation of delivery resources to meet delivery requirements.
sP5: Plan Return	A strategic or tactical process to establish and adjust courses of action or tasks over specified time periods that represent a projected appropriation of return resources and assets to meet anticipated as well as unanticipated return requirements. The scope includes unplanned returns of sold merchandise as well as planned returns of "rotatable" products that are refurbished for reissue to customers.
sEP: Enable Plan	The collection of processes associated with managing and monitoring Plan process data, performance and relationships.

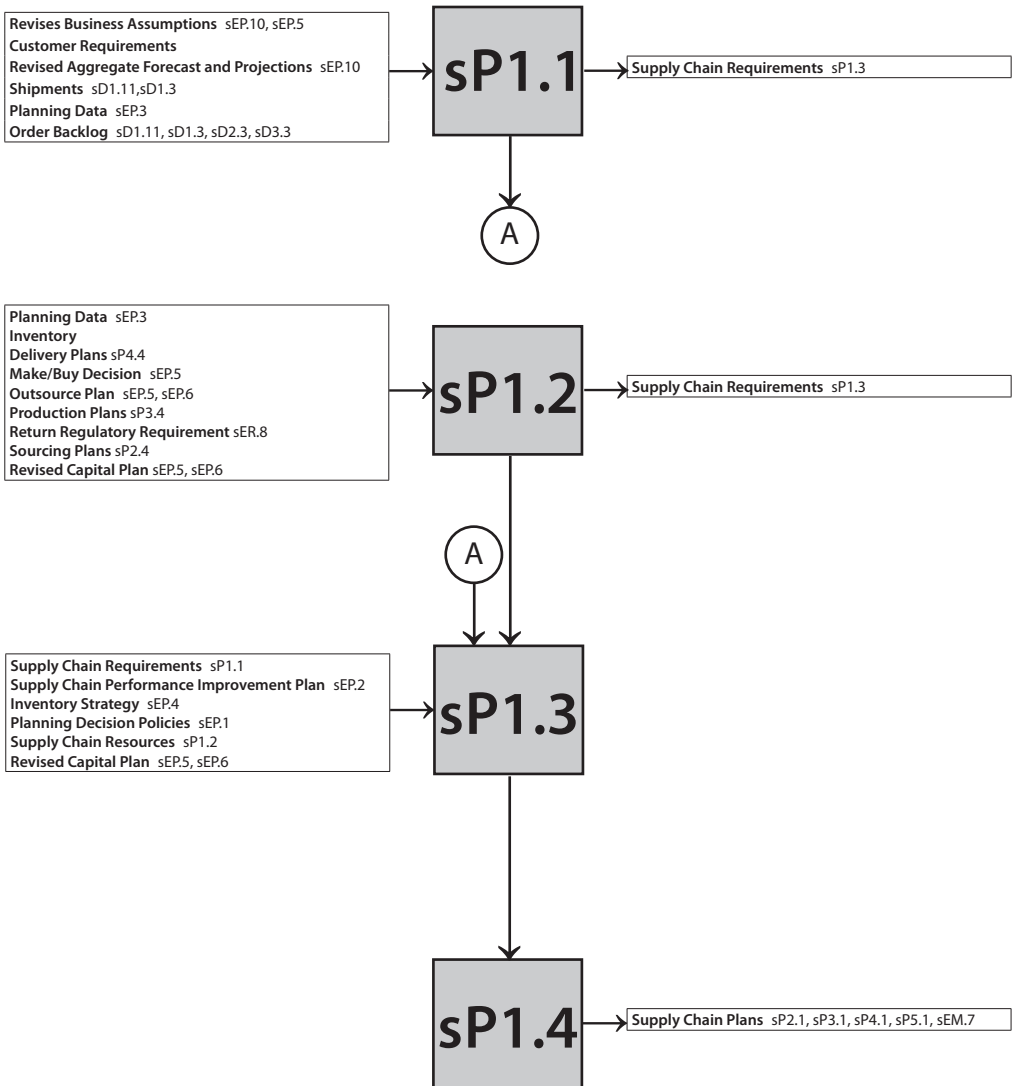
Plan Supply Chain

The development and establishment of courses of action over specified time periods that represent a projected appropriation of supply chain resources to meet supply chain requirements for the longest time fence constraints of supply resources.

Performance Attributes	Metric
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Plan Cycle Time
Supply Chain Asset Management	Return on Working Capital, Cash-To-Cash Cycle Time, Return on Supply Chain Fixed Assets
Supply Chain Costs	Cost to Plan Supply Chain, Environmental Compliance Cost
Best Practices	Description/Definition
All Functions and Organizations Understand Their Impact on Supply/ Demand Balancing, Including Sales, Marketing, Product Management, Manufacturing, Customer, Suppliers, Materials Management, and Product Development	None identified
Change in the Demand Signal Instantaneously "Reconfigures" the Production and Supply Plans	Event-driven supply chain re-planning
Collaborative Planning, Forecasting, Replenishment (CPFR)	Collaborative Planning, Forecasting and Replenishment is a concept that allows collaborative processes across the supply chain, using a set of process and technology models....(From www.cpfr.org/intro.html)
Supply Chain is Designed to Have Supply Flexibility Equal to Demand Volatility	None identified
On-Line Visibility of All Supply-Chain Demand Requirements and Resources, both Currently Available and Committed (Pegged)	Enterprise resource planning system Customer relationship management system

Best Practices cont.	Description/Definition cont.
Sales and Operations Planning (S&OP)	A process to develop tactical plans that provide management the ability to strategically direct its businesses to achieve competitive advantage on a continuous basis by integrating customer-focused marketing plans for new and existing products with the management of the supply chain. The process brings together all the plans for the business (sales, marketing, development, manufacturing, sourcing, and financial) into one integrated set of plans. It is performed at least once a month and is reviewed by management at an aggregate (product family) level. The process must reconcile all supply, demand, and new-product plans at both the detail and aggregate levels and tie to the business plan. It is the definitive statement of the company's plans for the near to intermediate term, covering a horizon sufficient to plan for resources and to support the annual business planning process. Executed properly, the sales and operation planning process links the strategic plans for the business with its execution and reviews performance measurements for continuous improvement. (From APICS online dictionary.)
Tools Support Balanced Decision Making (e.g., Trade-Off between Service Level and Inventory Investment)	Supply chain planning optimization system
Supply/Demand Process is Highly Integrated from Customer Data Gathering to Order Receipt, through Production to Supplier Request	Integrated supply chain planning system with interfaces to all supply/demand data sources through public and private digitally enabled supply networks.
Re-Balancing of Full-Stream Supply/ Demand on a Daily Basis, Including Source-Make-Deliver Resources and Requirements from "Customers' Customer to Suppliers' Supplier"	Enterprise-wide planning system customer Relationship Systems
Identify and manage environmental impacts	Identify and manage environmental aspects and impacts of supply chain operations to mitigate the impacts mitigate the impacts
Responsiveness and Flexibility Are Emphasized By Developing Expertise in Making Business Processes Re-Programmable, Re-Configurable and Continuously Changeable	Integrated process modeling and software reconfiguration tools

Best Practices cont.	Description/Definition cont.
Capability to Run “Simulated” Full-Stream Supply/Demand Balancing for “What-If” Scenarios	Supply chain modeling and visualization system
Environmental Management System (EMS)	Implement an Environmental Management System (EMS) to track and manage environmental performance and to track performance against regulatory requirements
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer’s inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Measure environmental impacts	Measure environmental impacts of the supply chain



Identify, Prioritize and Aggregate Supply Chain Requirements

The process of identifying, aggregating, and prioritizing, all sources of demand for the integrated supply chain of a product or service at the appropriate level, horizon and interval. The sales forecast is comprised of the following concepts: sales forecasting level, time horizon, and time interval. The sales forecasting level is the focal point in the corporate hierarchy where the forecast is needed at the most generic level. i.e. Corporate forecast, Divisional forecast, Product Line forecast, SKU, SKU by Location. The sales forecasting time horizon generally coincides with the time frame of the plan for which it was developed i.e. Annual, 1-5 years, 1- 6 months, Daily, Weekly, Monthly. The sales forecasting time interval generally coincides with how often the plan is updated, i.e. Daily, Weekly, Monthly, and Quarterly.

Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Identify, Prioritize, and Aggregate Supply Chain Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Prioritize, and Aggregate Supply Chain Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Consider environmental impacts	Consider environmental impacts when identifying requirements
Digital Links (XML Based, EDI. Etc.) Among Supply Chain Members	Real-time exchange of supply chain information between supply chain members collaborative planning systems, Internet Trading Exchanges, B2B Integration and Application Server Systems
Joint Service Agreements (JSA)	Collaborative Planning Systems
Push-Based Forecasts Are Replaced with Customer Replenishment "Pull- Based" Signals	Standards Based (RosettaNet, eBXML, OAGI, etc) B2B integration tools and systems
Systems Support Accurate On-Line Visibility of Full-Stream Demand Requirements and Priorities	Advance Planning and Scheduling System, Supply Chain Event Management Software
Supply Chain Advance Planning System	Collaboration among Supply Chain partners extends outwards to customers, spanning the supply chain. Planning, Re- planning, Business Rules, Plan Changes
Collaboration among Operations Strategy Team	Supply Chain Advanced Planning Systems, Supply Chain Integration Systems, Integration between supply chain advanced planning and ERP execution systems, Supply Chain Capacity Planning Systems

Inputs
Revises Business Assumptions sEP.10, sEP.5
Customer Requirements
Revised Aggregate Forecast and Projections sEP.10
Shipments sD1.11, sD1.3
Planning Data sEP.3
Order Backlog sD1.11, sD1.3, sD2.3, sD3.3

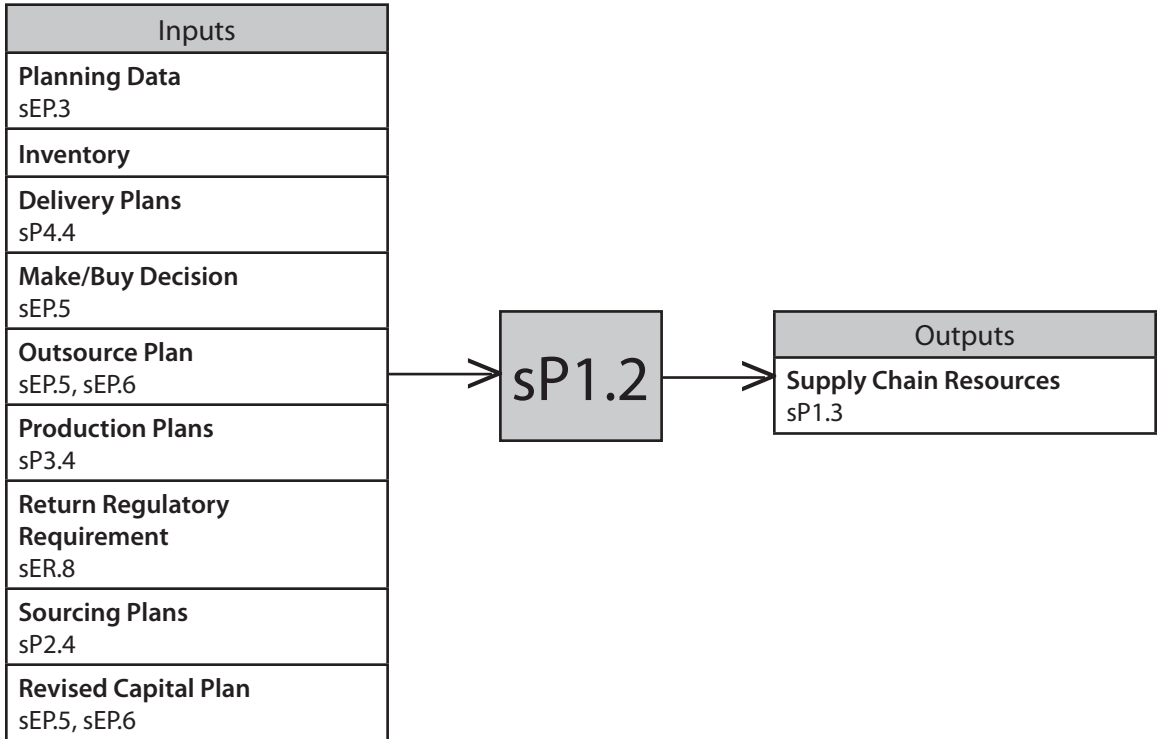


Outputs
Supply Chain Requirements sP1.3

Identify, Prioritize and Aggregate Supply-Chain Resources

The process of identifying, prioritizing, and aggregating, as a whole with constituent parts, all sources of supply that are required and add value in the supply chain of a product or service at the appropriate level, horizon and interval.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Identify, Assess, and Aggregate Supply Chain Resources Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Assess, and Aggregate Supply Chain Resources
Supply Chain Asset Management	Inventory Days of Supply
Best Practices	Description/Definition
Consider environmental impacts	Consider environmental impacts when identifying requirements
Joint Service Agreements (JSA)	Collaborative Planning Systems
Lead Times Updated Monthly	None identified
Review Product Profitability	ABC and cost modeling.
Digital Links (XML Based, EDI. Etc.) Among Supply Chain Members	Real-time exchange of supply chain information between supply chain members collaborative planning systems, Internet Trading Exchanges, B2B Integration and Application Server Systems

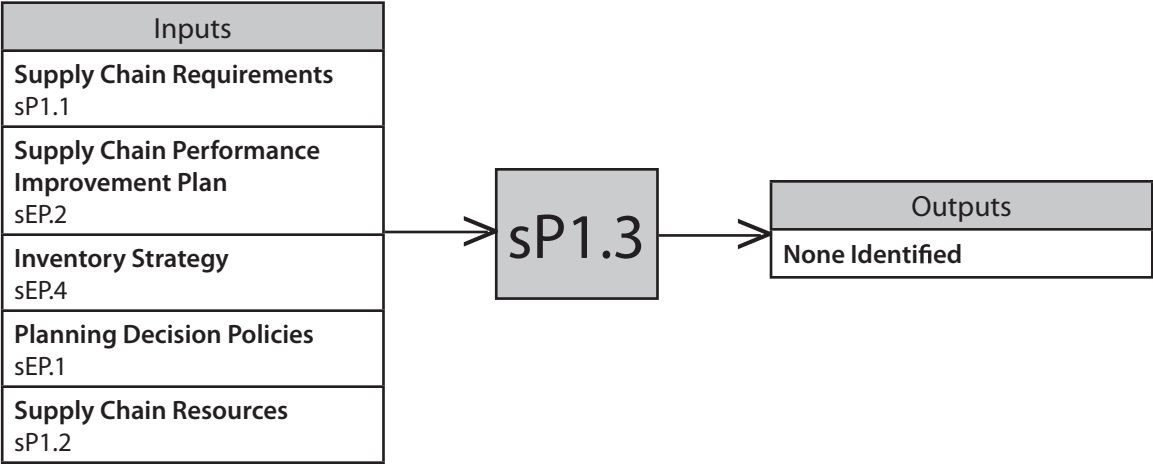


Balance Supply Chain Resources with SC Requirements

The process of identifying and measuring the gaps and imbalances between demand and resources in order to determine how to best resolve the variances through marketing, pricing, packaging, warehousing, outsource plans or some other action that will optimize service, flexibility, costs, assets, (or other supply chain inconsistencies) in an iterative and collaborative environment.

The process of developing a time-phased course of action that commits supply-chain resources to meet supply-chain requirements.

Performance Attributes	Metric
Supply Chain Reliability	Fill Rate
Supply Chain Responsiveness	Balance Supply Chain Resources with Supply Chain Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Balance Supply Chain Resources with Supply Chain Requirements
Supply Chain Asset Management	Inventory Days of Supply
Best Practices	Description/Definition
Balance environmental requirements	Balance environmental requirements as well as supply/demand requirements
Customer Relationship Management (CRM)	Software that provides customer input and keeps the customer informed about the planning of the production and delivery process by managing all contacts and communication with the customer thorough all channels including internet and traditional sales and customer service channels.
Demand Planning, Demand Flow Leadership	Software that provides multiple data models including the business rules and metrics for the entire supply chain planning process. Algorithms use the business rules and metrics as the drivers for the planning engine.
Business Intelligence (BI)	A data warehouse / data mart is the source of all planning (master) data, business rules and transaction data. Analytical tools enable the ongoing maintenance and improvement of the business rules based on actual data.

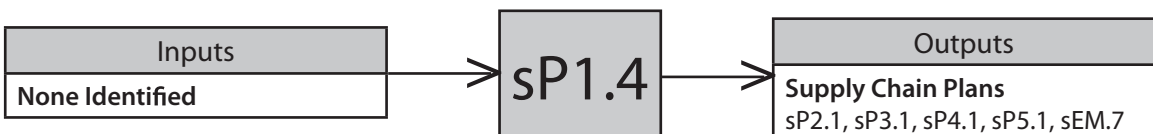


sP1.4

Establish & Communicate Supply-Chain Plans

The establishment and communication of courses of action over the appropriate time-defined (long-term, annual, monthly, weekly) planning horizon and interval, representing a projected appropriation of supply-chain resources to meet supply-chain requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Establish Supply Chain Plans Cycle Time
Supply Chain Agility	None Identified
Supply Chain Asset Management	Inventory Days of Supply
Supply Chain Costs	Cost to Establish and Communicate Supply Chain Plans
Best Practices	Description/Definition
Collaboration among Operations Strategy Team	Supply Chain Advanced Planning Systems, Supply Chain Integration Systems, Integration between supply chain advanced planning and ERP execution systems, Supply Chain Capacity Planning Systems
Digital Links (XML Based, EDI. Etc.) Among Supply Chain Members	Real-time exchange of supply chain information between supply chain members collaborative planning systems, Internet Trading Exchanges, B2B Integration and Application Server Systems
Communicate environmental requirements	Include environmental requirements in communications.
Supply Chain Advance Planning System	Collaboration among Supply Chain partners extends outwards to customers, spanning the supply chain. Planning, Re-planning, Business Rules, Plan Changes
Systems Support Accurate On-Line Visibility of Full-Stream Demand Requirements and Priorities as Well as Resource Utilization and Availability	Advance Planning and Scheduling System
Collaborate with supply chain partners	Supply chain partners collaborate to improve the environmental performance of the supply chain
Joint Service Agreements (JSA)	Collaborative Planning Systems

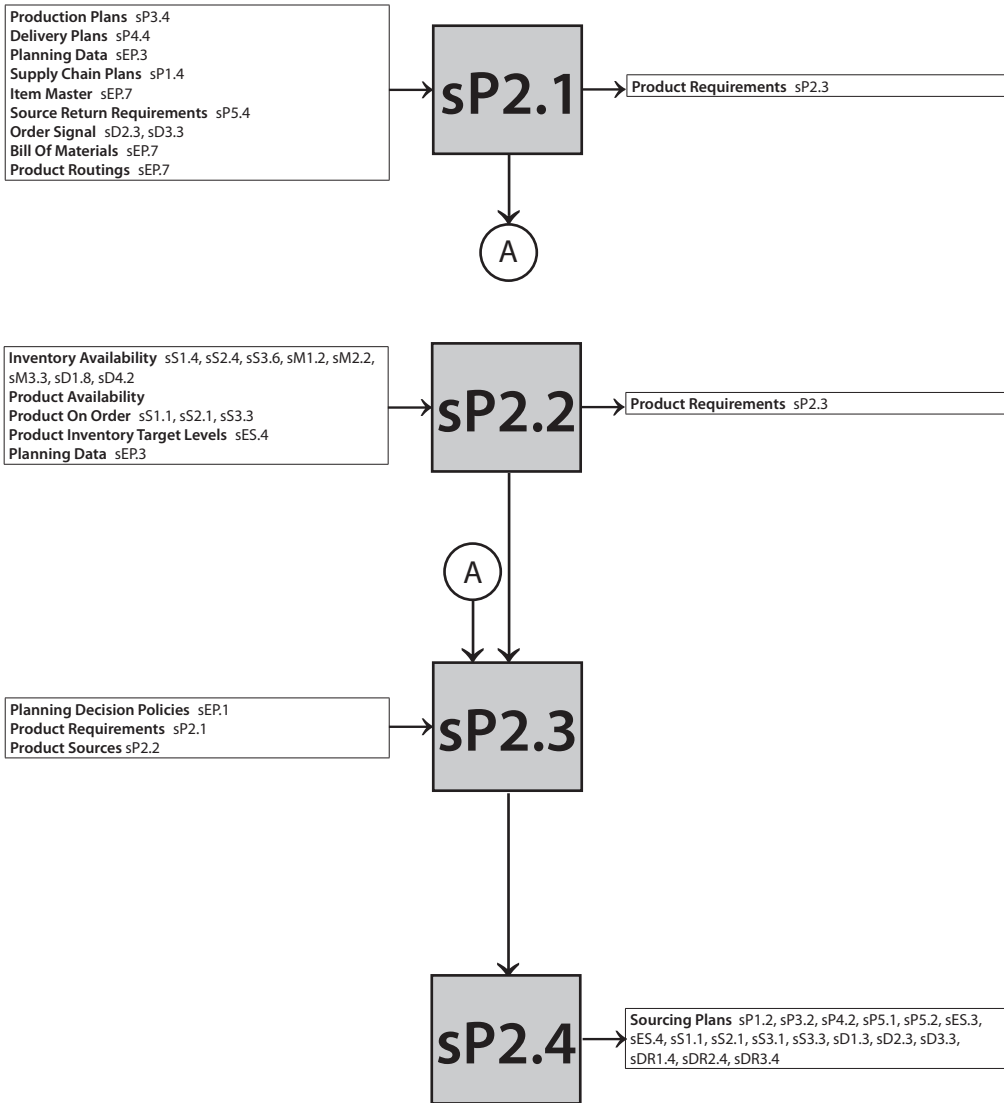


Plan Source

The development and establishment of courses of action over specified time periods that represent a projected appropriation of material resources to meet supply chain requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Plan Source Cycle Time, Order Fulfillment Cycle Time
Supply Chain Agility	None Identified
Supply Chain Asset Management	Return on Supply Chain Fixed Assets, Return on Working Capital, Cash-To-Cash Cycle Time
Supply Chain Costs	Cost to Plan Source
Best Practices	Description/Definition
Select suppliers with EMS	Select suppliers with active EMS systems
Track supplier environmental records	Processes to identify suppliers with good environmental records
Distinct and Consistent Linkages Exist to Ensure Disruptions and Opportunities in Material Resources Are Quickly and Accurately Communicated and Acted Upon	Bi-directional Digital Links (XML, EDI, etc) or Internet procurement networks to customer service linkage
Joint Service Agreements with Suppliers Define the Levels of "Flexibility" or Resource Upside Available Within Stated Lead Times and Agreed Upon Conditions	None identified
All Key Participants in the Supply Chain, Including Strategic Partners, Have Full Visibility of the Demand/ Supply Plan	Supply Chain Event Management Systems
Purchase environmentally friendly materials	Purchase environmentally friendly materials
EDI Links Integrate Supplier Resource Information (Inventory, Capacity Availability, Etc.) with Own Resources	Inter-company resource planning with EDI/Internet communication

sP2

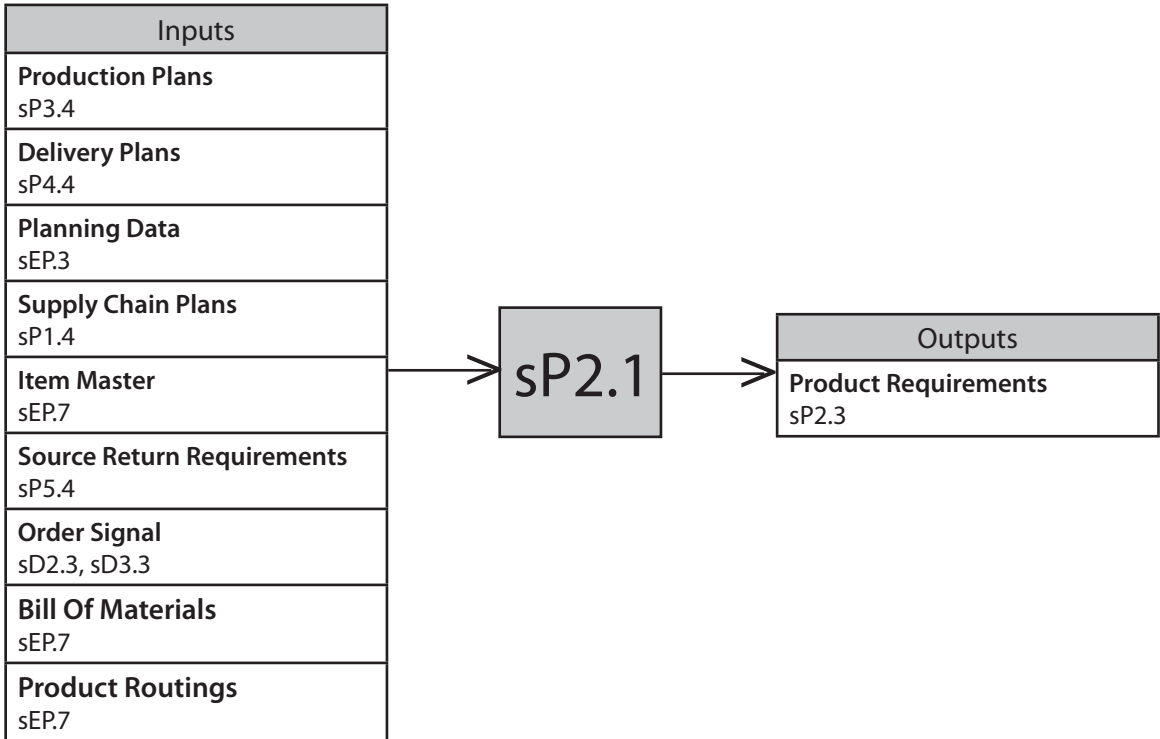


Identify, Prioritize and Aggregate Product Requirements

The process of identifying, prioritizing, and considering, as a whole with constituent parts, all sources of demand for a product or service in the supply chain.

Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Identify, Prioritize, and Aggregate Product Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Prioritize, and Aggregate Product Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Master Production Scheduling Reflects Management of Capacity and/or Supply Constraints	None identified
Sales and Operations Agree to Limits of Short Term Flexibility	None identified
The Demand Plan is Updated Frequently to Reflect Actual Consumption or Customer Forecast Information	None identified
Capacity and Supply Constraints Are Balanced Against Demand during the Planning Cycle	None identified
Categorize 100% of Total Inventory (Active, Usable, Excess, Obsolete) for Appropriate Action	None identified

sP2.1

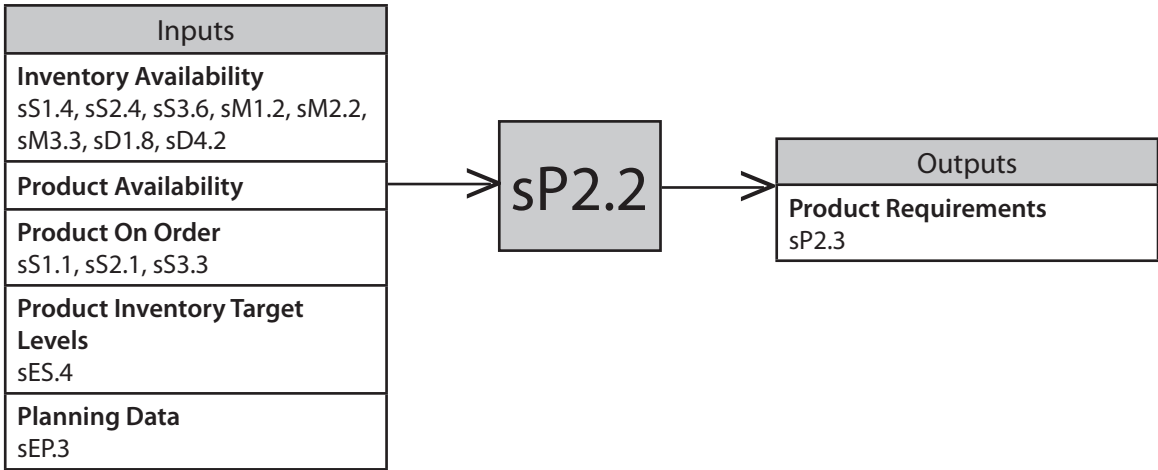


Identify, Assess and Aggregate Product Resources

The process of identifying, evaluating, and considering, as a whole with constituent parts, all material and other resources used to add value in the supply chain for a product or services.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Identify, Assess, and Aggregate Product Resources Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Assess, and Aggregate Product Resources
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Inventory Performance is Measured at the Dollar and Unit Levels	None identified
Capacity and Supply Constraints Are Balanced Against Demand during the Planning Cycle	None identified
Identify recyclable/reusable materials	Identify recyclable/reusable materials
Identify green products	Identify products that are manufactured to minimize environmental impacts
Categorize 100% of Total Inventory (Active, Usable, Excess, Obsolete) for Appropriate Action	None identified
Obsolete Inventory is Reviewed at the Part Number Level	None identified
Minimize packaging	Work with suppliers to minimize packaging requirements and use reusable packaging material
Inventory is Planned at the Part Level, Based on Supply and Demand Variability	None identified
Inventory targets Are Reviewed and Adjusted Frequently	Digital Linkages using XML standards (RosettaNet, eBXML, OAGI) to automatically query inventory levels.

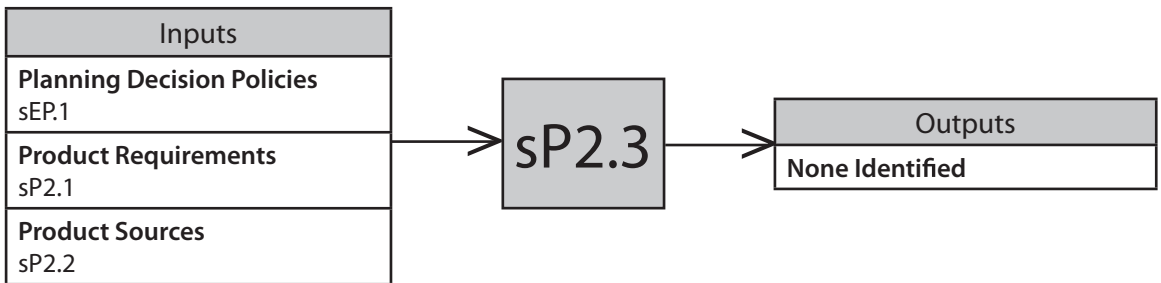
sP2.2



Balance Product Resources with Product Requirements

The process of developing a time-phased course of action that commits resources to meet requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Balance Product Resources with Product Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Balance Product Resources with Product Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Suppliers Share Responsibility for Balancing Supply and Demand through Joint Service Agreements	None identified

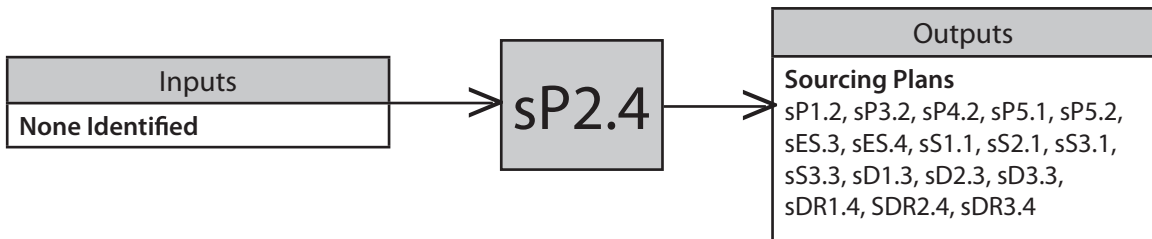


sP2.4

Establish Sourcing Plans

The establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet sourcing plan requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Establish Sourcing Plans Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Establish Sourcing Plans
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Blanket Purchase Orders Cover Period Requirements	None identified
Digital Linkage (EDI, XML, Etc.) is Used to Provide Real-Time Demand Information and Handle Routine Transactions	None identified

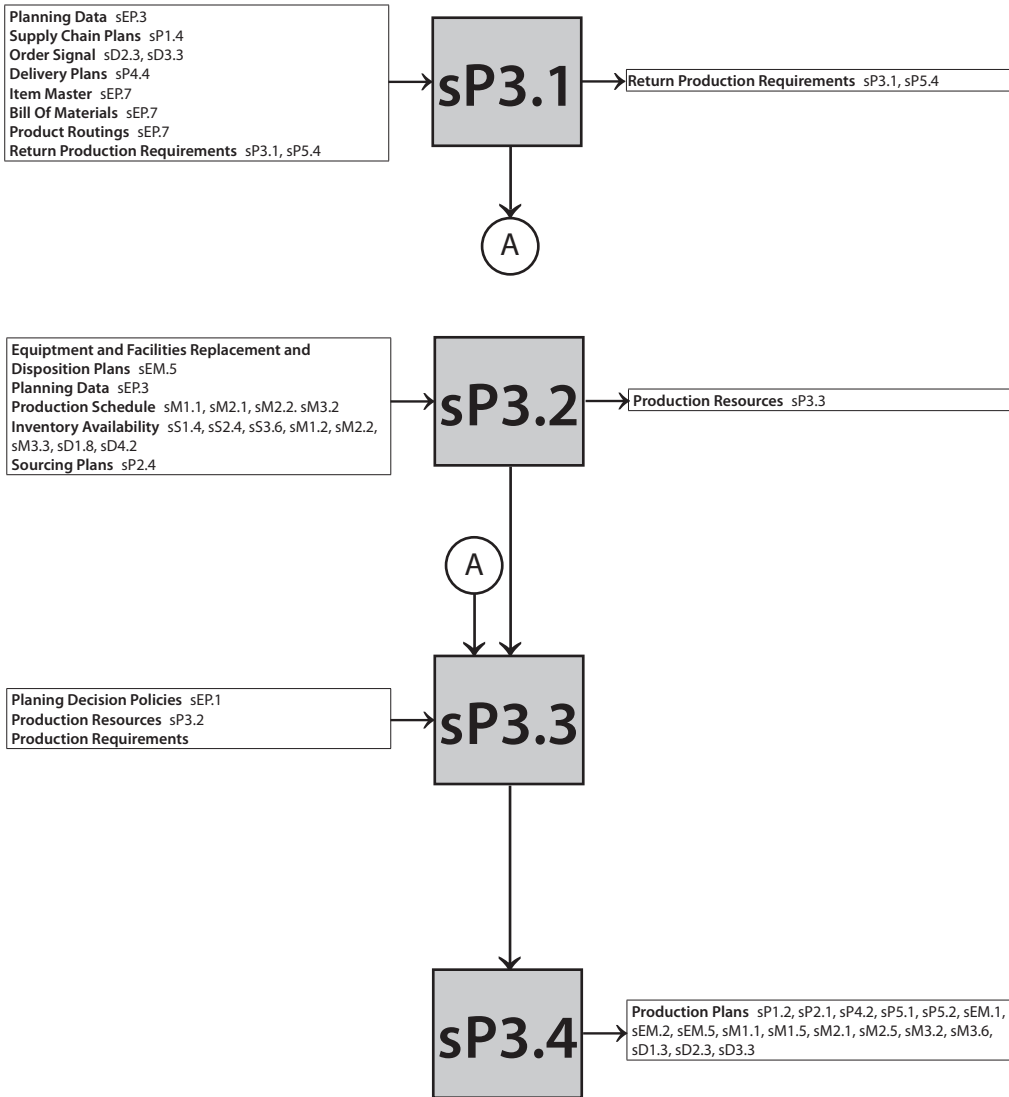


Plan Make

The development and establishment of courses of action over specified time periods that represent a projected appropriation of production resources to meet production requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Order Fulfillment Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Energy Cost per Unit, Energy consumption
Supply Chain Asset Management	Cash-To-Cash Cycle Time, Return on Working Capital, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
Distinct and Consistent Linkages Exist to Ensure that Disruptions and Opportunities in Production Are Quickly and Accurately Communicated and Responses Made	Multi-plant supply/demand planning and execution
Reduce Make environmental impacts	Identify processes that reduce environmental impacts of manufacturing

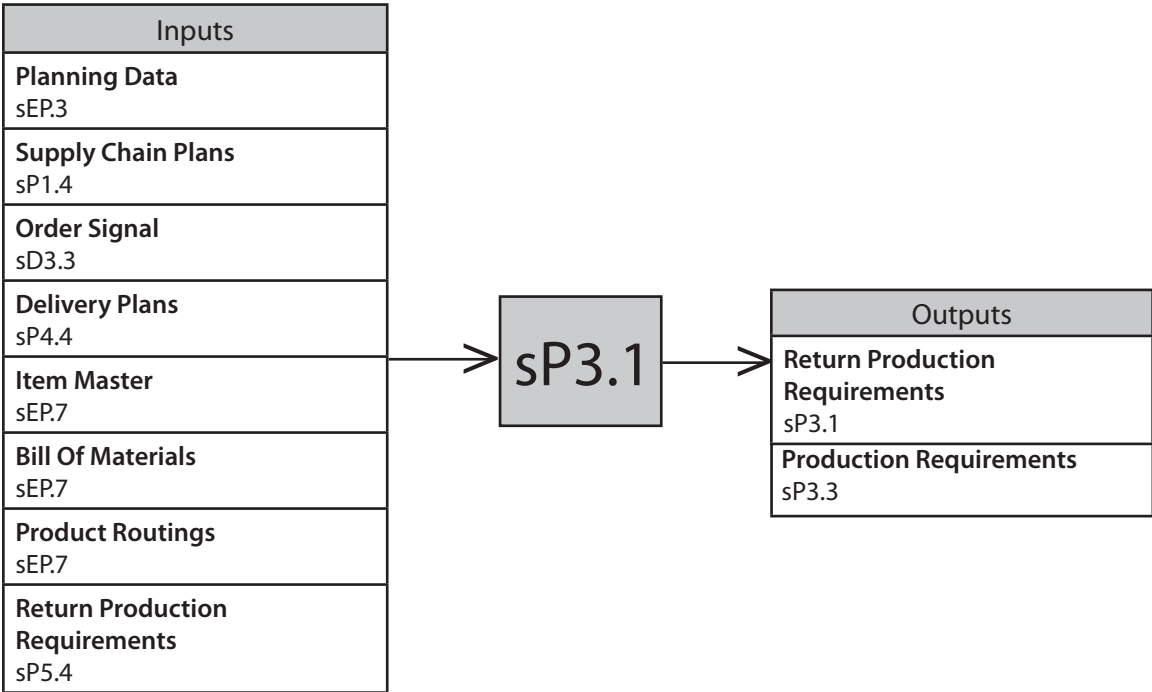
sP3



Identify, Prioritize and Aggregate Production Requirements

The process of identifying, prioritizing, and considering as a whole with constituent parts, all sources of demand in the creation of a product or service.

Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Identify, Prioritize, and Aggregate Production Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Prioritize, and Aggregate Production Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Consideration of Supplier’s Material Availability in Company’s Supply Resources (Including Supplier’s Production Plans & Capability, Inventory, and Delivery Plans)	Digital linkage to supplier quoting, planning, configuration and customer service applications

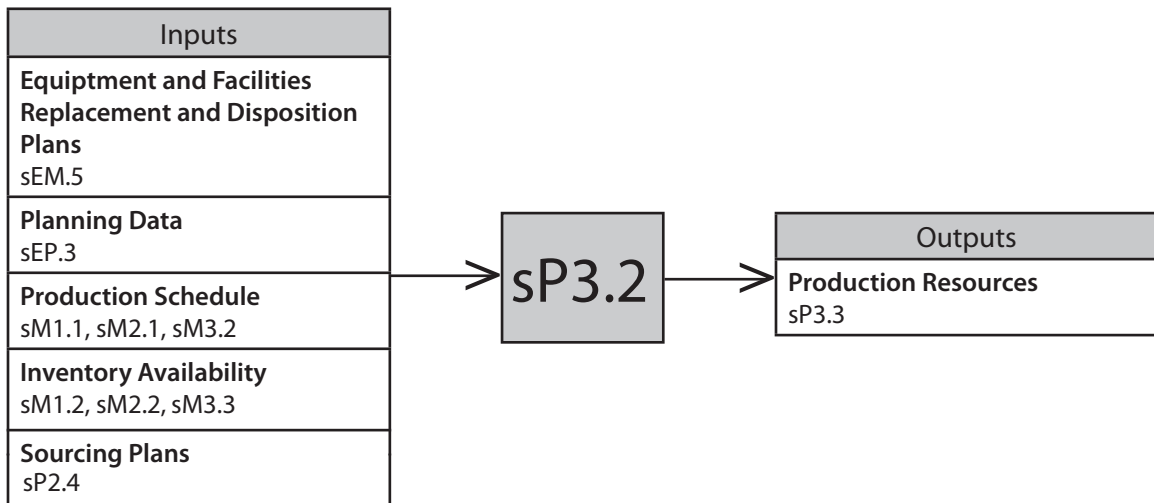


sP3.2

Identify, Assess and Aggregate Production Resources

The process of identifying, evaluating, and considering, as a whole with constituent parts, all things that add value in the creation of a product or performance of a service.

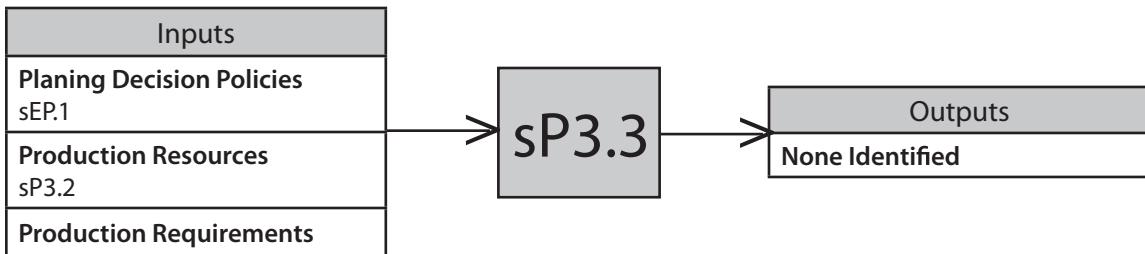
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Identify, Assess, and Aggregate Product Resources Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Assess, and Aggregate Production Resources
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Obsolete Inventory is Reviewed at the Part Number Level	None identified
Inventory targets Are Reviewed and Adjusted Frequently	Digital Linkages using XML standards (RosettaNet, eXML, OAGI) to automatically query inventory levels.
Consider environmental production constraints	Environmental constraints are considered as part of production capacity



Balance Production Resources with Production Requirements

The process of developing a time-phased course of action that commits creation and operation resources to meet creation and operation requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Balance Production Resources with Production Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Balance Production Resources with Production Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Balance environmental requirements	Balance environmental requirements as well as supply/demand requirements
Inventory targets Are Reviewed and Adjusted Frequently	Digital Linkages using XML standards (RosettaNet, eBXML, OAGI) to automatically query inventory levels.

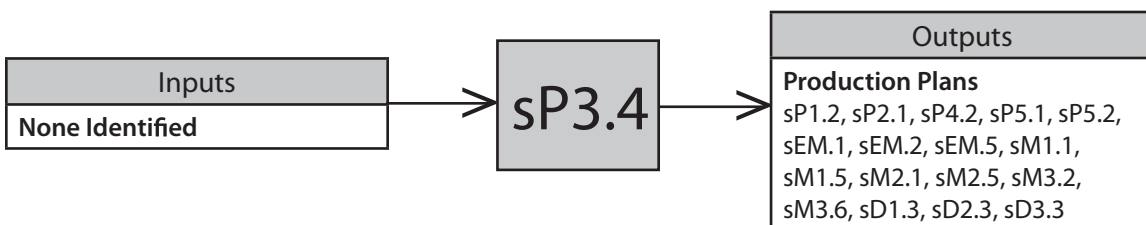


sP3.4

Establish Production Plans

The establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet production and operating plan requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Establish Production Plans Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Establish Production Plans
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Minimize energy use	Plans are created to minimize energy use
Minimize Make emissions	Plans are established to minimize emissions (e.g., release VOCs after dark)
Unplanned Orders Are Accepted and Scheduled Only When There is No Detrimental Impact on Overall Product Delivery Plan	Digital Linkages using XML standards (RosettaNet, eXML, OAGI) to automatically query production capacity and ATP and schedule unplanned orders.

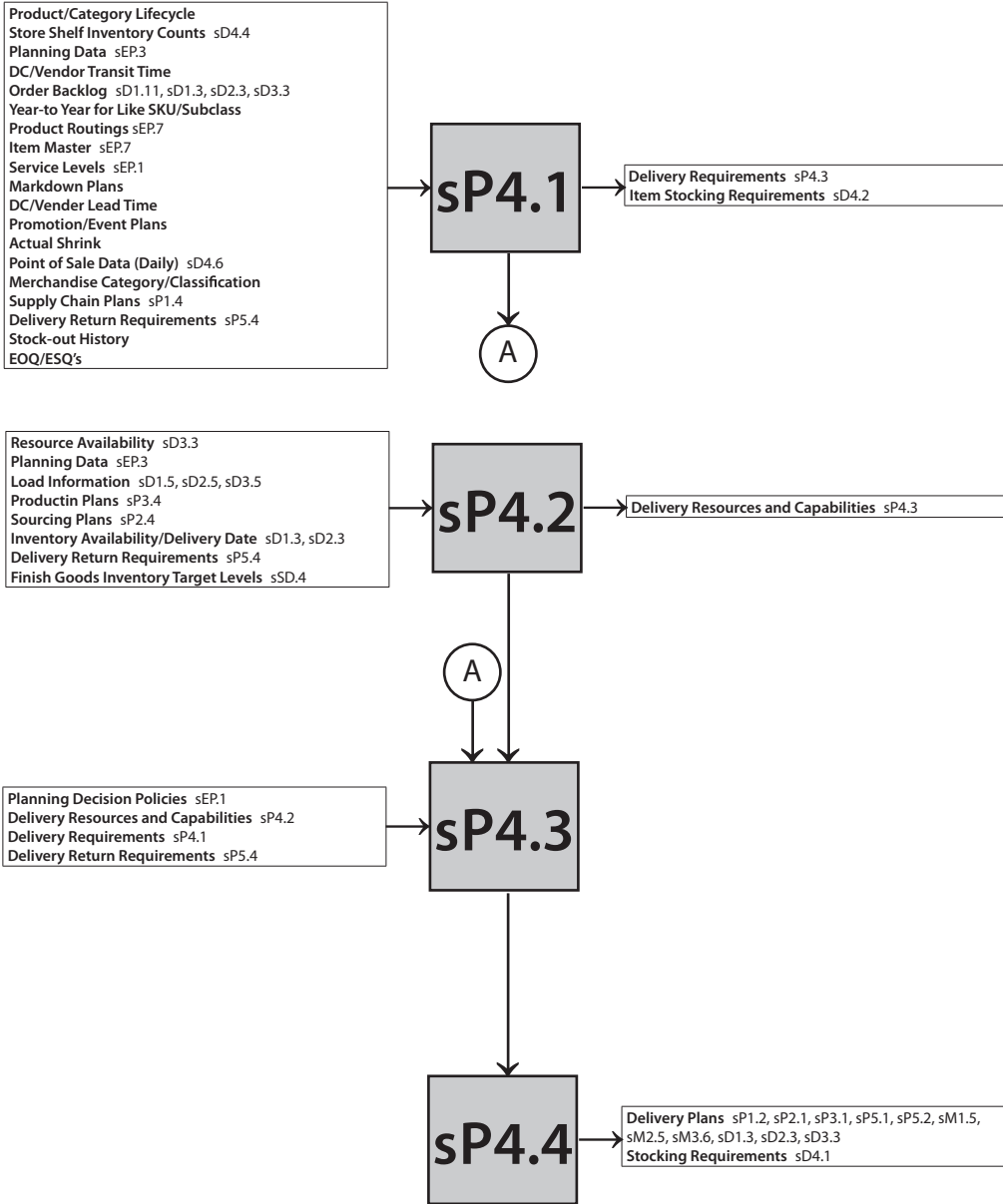


Plan Deliver

The development and establishment of courses of action over specified time periods that represent a projected appropriation of delivery resources to meet delivery requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Order Fulfillment Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Plan Deliver, Total Deliver Costs
Supply Chain Asset Management	Return on Working Capital, Return on Supply Chain Fixed Assets, Cash-To-Cash Cycle Time
Best Practices	Description/Definition
Distinct and Consistent Linkages Exist to Ensure Disruptions and Opportunities in Material Resources Are Quickly and Accurately Communicated and Acted Upon	Bi-directional Digital Links (XML, EDI, etc) or Internet procurement networks to customer service linkage
Proactive Education of Customers to Set Expectations and Encourage Close Working Relationships (Knowledge of Long-Lead Items, Visibility to Supply Resources, Agreement on Levels of Flexibility)	None identified
Minimize vehicle fuel use	Plan the use of high-efficiency, low-emissions, or alternative-fuel vehicles where possible

sP4



Identify, Prioritize and Aggregate Delivery Requirements

The process of identifying, prioritizing, and considering, as a whole with constituent parts, all sources of demand in the delivery of a product or service.

Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Identify, Prioritize, and Aggregate Delivery Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Transportation Costs, Cost to Identify, Prioritize, and Aggregate Delivery Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Customer Relationship and Digital Linkages (XML, EDI, Etc.) Provide Accurate Visibility into Actual Demand via Customer Forecasts, Product Plans, Production Plans, and Inventory Positions	Tightly integrated supply chain or demand planning with point of sale and customer inventory systems
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Ideal Stock Position Based on Days/ Weeks of Supply	Pilot by Wal-Mart. IT
Planogram Flexibility for Seasonal/ Promotional changes	None identified
Electronic Matching Between POS Data and Store Inventory (Shelves and Back Room)	Integrated Software Systems
Eliminate "Special Deals" Sales to Reduce Returns and Improve Forecast Accuracy (Reduces Uncertainty, Lowers Safety Stock Requirements, Cheaper to Administer)	None identified
RFID and Other Tagging	POG software/field force

sP4.1

Unplanned Orders Are Accepted and Scheduled Only When There is No Detrimental Impact on Overall Product Delivery Plan

Digital Linkages using XML standards (RosettaNet, eBXML, OAGI) to automatically query production capacity and ATP and schedule unplanned orders.

Best Practices cont.

Description/Definition cont.

Forecasts Are Replaced with Actual Customer Replenishment Signals and Orders Where Possible

B2B Integration and Application Server Systems

Matching Shelf Stock to Expectations

A software based system that corrects shelf inventory levels based on actual product present (possible RFID solution). Identifies stock-outs from shrinkage or item misplacement.

Aggregate requirements

Aggregate requirements to minimize transportation requirements

Inputs
Product/Category Lifecycle
Store Shelf Inventory Counts sD4.4
Planning Data sEP.3
DC/Vendor Transit Time
Order Backlog sD1.11, sD1.3, sD2.3, sD3.3
Year-to Year for Like SKU/ Subclass
Product Routings sEP.7
Item Master sEP.7
Service Levels sEP.1
Markdown Plans
DC/Vender Lead Time
Promotion/Event Plans
Actual Shrink
Point of Sale Data (Daily) sD4.6
Merchandise Category/ Classification
Supply Chain Plans sP1.4
Delivery Return Requirements sP5.4
Stock-out History
EOQ/ESQ's



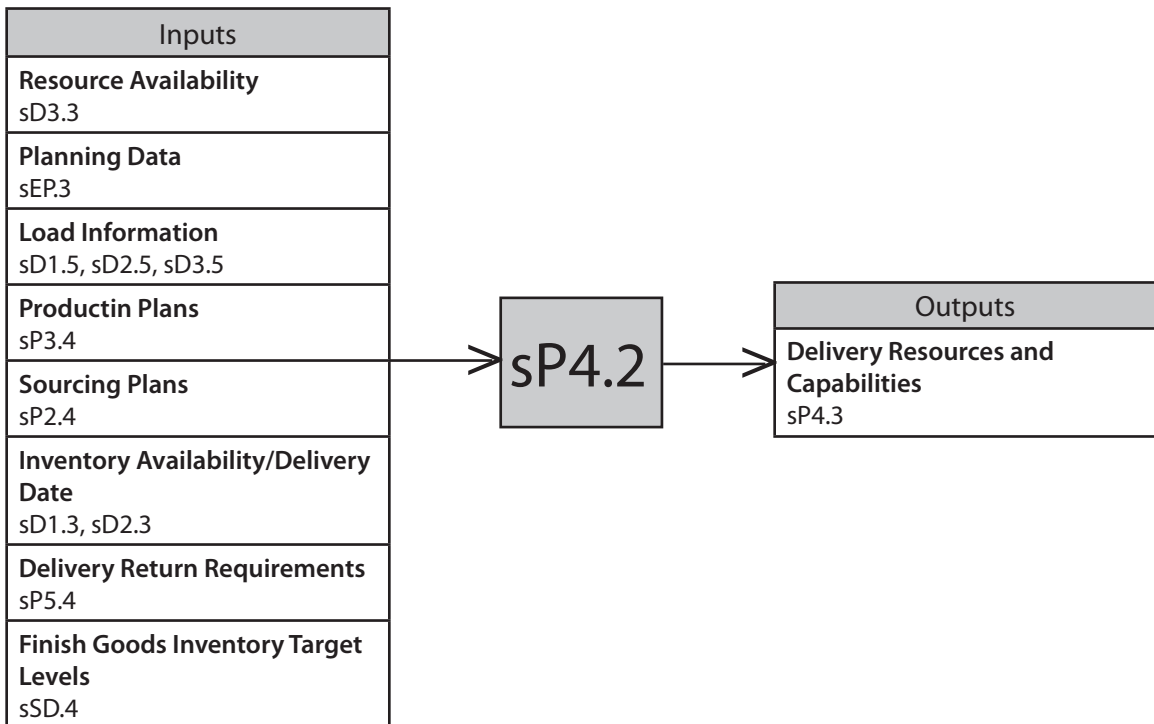
Outputs
Delivery Requirements sP4.3
Item Stocking Requirements sD4.2

sP4.2

Identify, Assess and Aggregate Delivery Resources

The process of identifying, evaluating, and considering, as a whole with constituent parts, all things that add value in the delivery of a product or service.

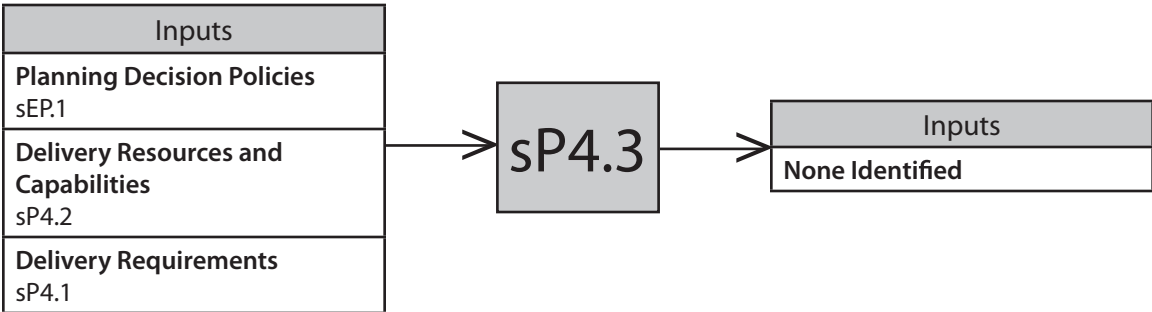
Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Identify, Assess, and Aggregate Delivery Resources Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Assess, and Aggregate Delivery Resources
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Use reusable packaging	Use reusable packaging where possible



Balance Delivery Resources and Capabilities with Delivery Requirements

The process of developing a time-phased course of action that commits delivery resources to meet delivery requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Transportation Costs, Cost to Identify, Assess, and Aggregate Delivery Resources
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Demand Priorities Reflecting Strategic Customer Relationships as Business Policies Are Automatically Followed in Allocating Resources; First-In-First-Out (FIFO) is Utilized as the Default Scheduling Priority	Rules-based distribution planning system. Trading partner agreements
Maximize loads, minimize runs	Maximize load size; minimize transportation runs

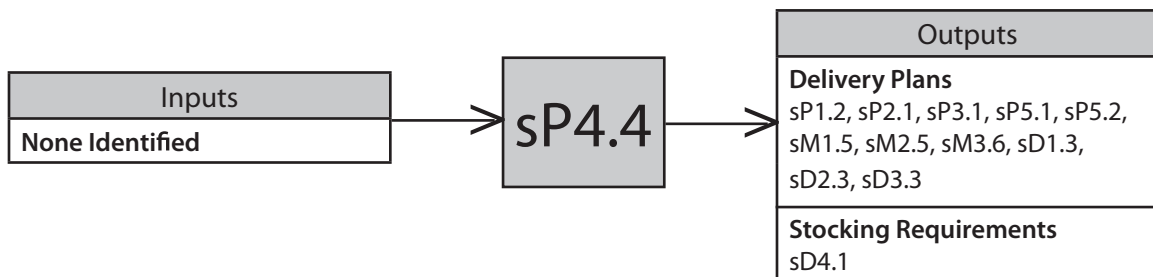


sP4.4

Establish Delivery Plans

The establishment of courses of action over specified time periods that represent a projected appropriation of delivery resources to meet delivery requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Establish Delivery Plans Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Distribution Costs, Cost to Establish Delivery Plans
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
To Address Conditions which Cannot be Adequately Satisfied During the Current Planning Period, Each Functional Area Develops Prioritized Recommendations for the Subsequent Planning Period	None identified
Plans Which Do Not Violate Business Rules Are Communicated Openly and Cross-Functionally for Execution	None identified
Specific Changes to the Plan Are Agreed to Cross-Functionally, According to Defined Business Rules	None identified
Maximize loads, minimize runs	Maximize load size; minimize transportation runs
Plans that Violate Business Rules (e.g. Joint Service Agreements) Are Addressed Cross-Functionally, Considering Total Business Impacts (Revenue, Cost, Quality, Customer Service, Etc.)	None identified

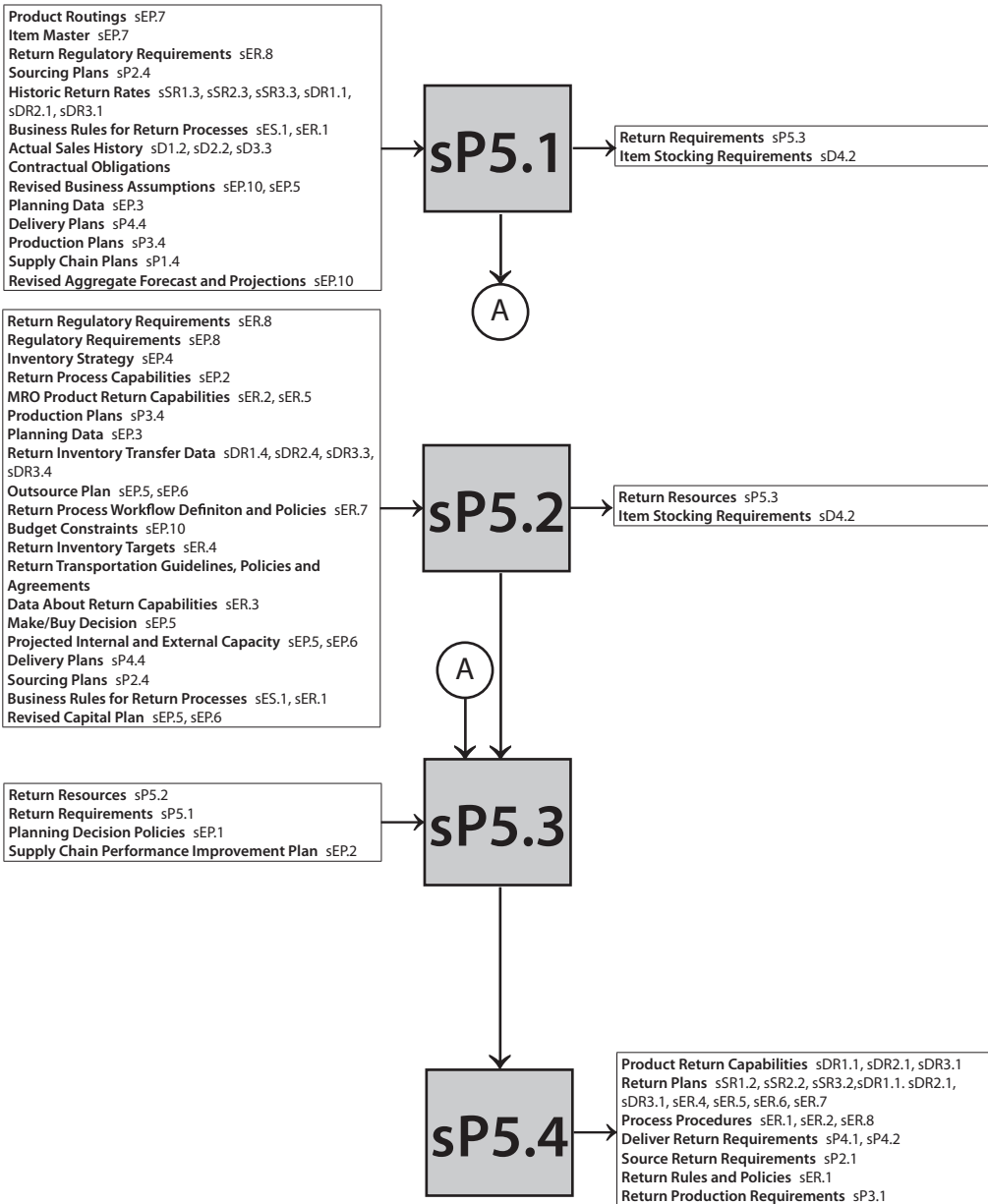


Plan Return

A strategic or tactical process to establish and adjust courses of action or tasks over specified time periods that represent a projected appropriation of return resources and assets to meet anticipated as well as unanticipated return requirements. The scope includes unplanned returns of sold merchandise as well as planned returns of “rotatable” products that are refurbished for reissue to customers.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Order Fulfillment Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Plan Return
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Planning and Forecasting Outsourced Return process	Collaborative planning and forecasting with RETURN outsourcing partners (3PL, reverse drop shippers, etc.)
Use Demand Planning	Demand Planning Systems to forecast returns, predict yield rates for reusable products or components, determine demand in a resale market, and project a revenue stream.

sP5



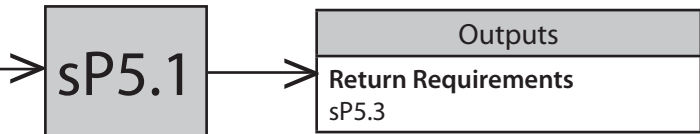
Assess and Aggregate Return Requirements

The process of identifying, evaluating, and considering, as a whole with constituent parts, all sources of demand for the return of a product.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Identify, Prioritize, and Aggregate Return Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Prioritize, and Aggregate Return Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Use Historical Based Return Rate Forecasts	None identified
Identify take-back programs	Identify products in take-back programs that are near end of life
Identify items to return	Identify MRO items that will need planned maintenance during the planning horizon
Real Time Return Anticipation	Having real time data on return demand and including it in the plan and forecast. Requires a connection with customers, call centers or CRM system, possibly to the store level with retail returns. The return demand needs to be included in the production plan as soon as possible because upon repair it may be the next piece of serviceable inventory to satisfy demand.

sP5.1

Inputs
Product Routings sEP.7
Item Master sEP.7
Return Regulatory Requirements sER.8
Sourcing Plans sP2.4
Historic Return Rates sSR1.3, sSR2.3, sSR3.3, sDR1.1, sDR2.1, sDR3.1
Business Rules for Return Processes sES.1, sER.1
Actual Sales History sD1.2, sD2.2, sD3.3
Contractual Obligations
Revised Business Assumptions sEP.10, sEP.5
Planning Data sEP.3
Delivery Plans sP4.4
Production Plans sP3.4
Supply Chain Plans sP1.4



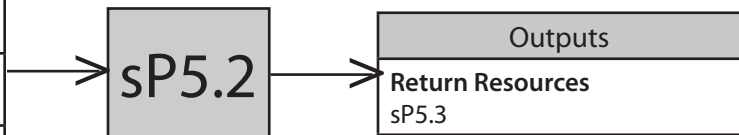
Identify, Assess, and Aggregate Return Resources

The process of identifying, evaluating, and consideration for all resources that add value to, execute, or constrain the processes for the return of a product.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify, Assess, and Aggregate Return Resources
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Allow Source Suppliers Full Visibility into the Current Return Situations and the Forecasted Return Activity	Shared supply chain forecasting and event management functionality with Source suppliers
Joint Service Agreements with Source Suppliers to Share Responsibilities and Costs of Returns	Collaborative planning tools with the Source suppliers
Rapid Reconfiguration of Return Capacity	Use of RETURN tracking and projection systems and flexible partner agreements that allow the rapid addition of RETURN capacity to match unexpected demand.

sP5.2

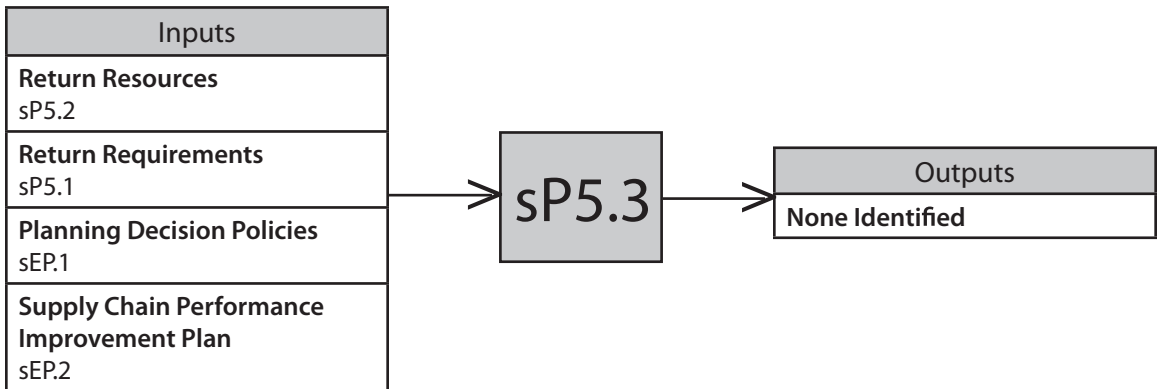
Inputs
Return Regulatory Requirements sER.8
Regulatory Requirements sEP.8
Inventory Strategy sEP.4
Return Process Capabilities sEP.2
MRO Product Return Capabilities sER.2, sER.5
Production Plans sP3.4
Planning Data sEP.3
Return Inventory Transfer Data sDR1.4, sDR2.4, sDR3.3, sDR3.4
Outsource Plan sEP.5, sEP.6
Return Process Workflow Definiton and Policies sER.7
Budget Constraints sEP.10
Return Inventory Targets sER.4
Return Transportation Guidelines, Policies and Agreements
Data About Return Capabilities sER.3
Make/Buy Decision sEP.5
Projected Internal and External Capacity sEP.5, sEP.6
Delivery Plans sP4.4
Sourcing Plans sP2.4
Business Rules for Return Processes sES.1, sER.1
Revised Capital Plan sEP.5, sEP.6



Balance Return Resources with Return Requirements

The process of developing courses of action that make feasible the commitment the appropriate return resources and or assets to satisfy return requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Balance Return Resources with Return Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Advance Planning Engines Applied to Returns	Advanced math model “solvers” that optimize / minimize constraints, routing, restocking priorities and costs.
Cost Accounting System to Determine the Best Return Process to Follow from a Cost of Business Perspective	ABC costing system
Dynamic Return Restocking Management	Dynamic prioritization of restocking plans in order to rapidly re-sell products that are in demand thus reducing new inventory demand.

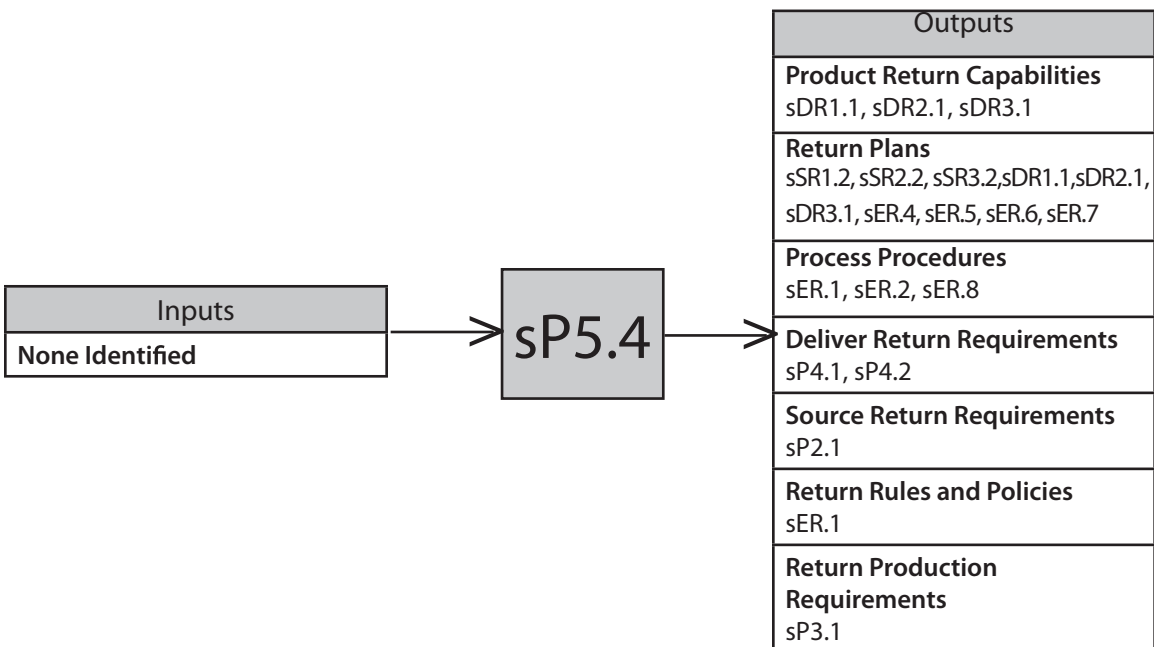


sP5.4

Establish and Communicate Return Plans

The establishment and communication of courses of action over specified time periods that represent a projected appropriation of required return resources and or assets to meet return process requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Establish and Communicate Return Plans Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Establish and Communicate Return Plans
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Rapid, Dynamic Reconfiguration of Return Process to Meet Demand	The ability to reset and reconfigure the RETURN process capacity, routings, etc. by transmitting new requirements and directives using mathematical models, the Internet, outsourcing and flexible partnership agreements. Also requires integration with the CRM system for real time redirection of customer returns based upon cost and capacity.
Full Internal (And External If Source Suppliers Share in the Return Process Responsibilities) Visibility to Return Plans	Intranet and Extranet communications tools

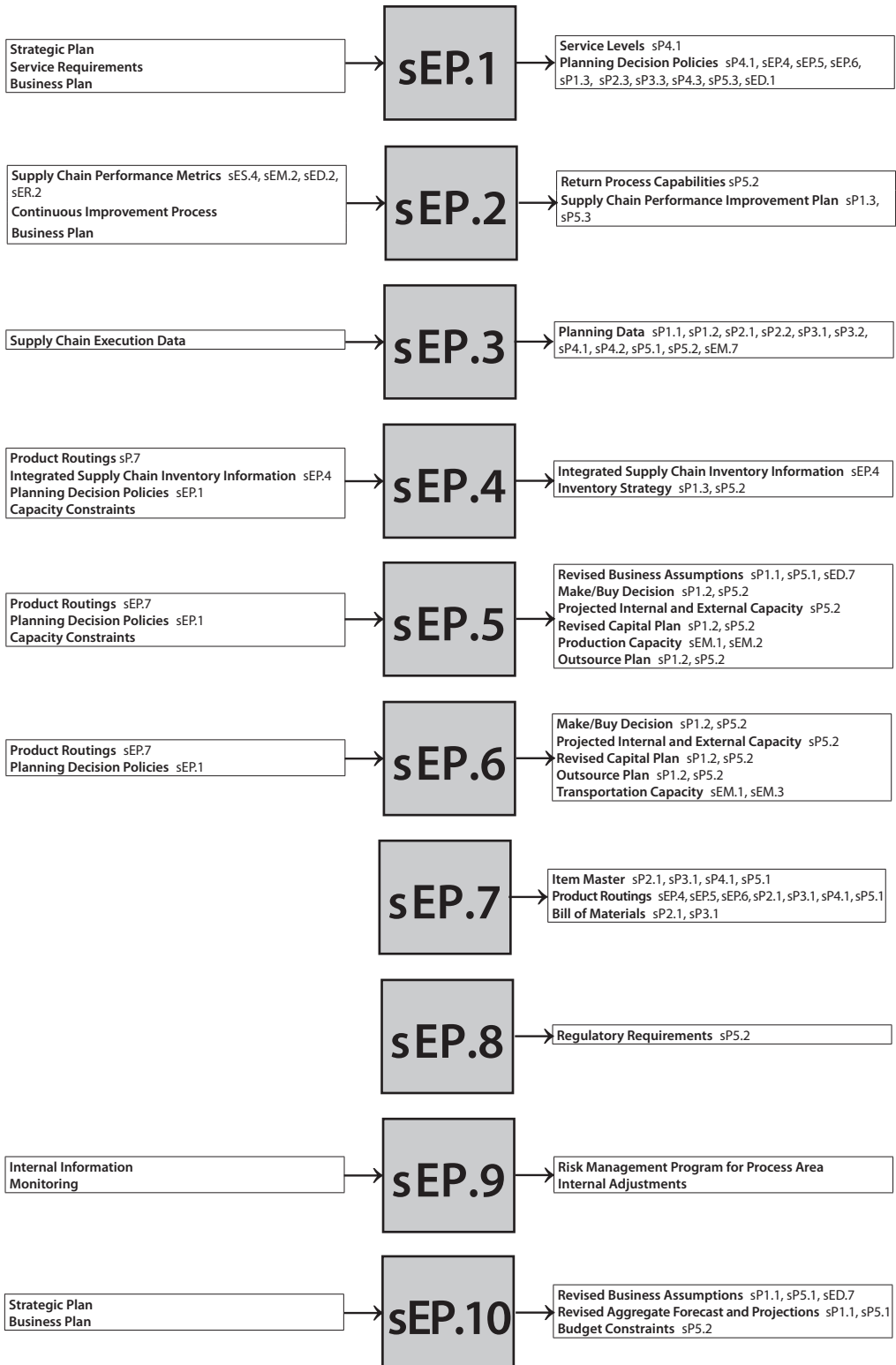


Enable Plan

The collection of processes associated with managing and monitoring Plan process data, performance and relationships.

Process Categories	
sEP.1: Manage Business Rules for Plan Processes	The process of establishing, maintaining, and enforcing decision support criteria for Supply Chain Planning which translate to rules for conducting business, i.e. developing and maintaining customer and channel performance standards of an entire supply chain such as service levels, given service requirements by supply chain stakeholders/trading partners. Business rules align PLAN process policies with business strategy, goals, and objectives.
sEP.2: Manage Performance of Supply Chain	The process of measuring actual integrated Supply Chain performance against internal and/or external standards to develop and implement a course of action to achieve targeted performance levels. Performance targets established for the execution of supply chain processes are reflected in the process elements for PLAN, i.e. cost, delivery reliability, cycle time, responsiveness, and assets.
sEP.3: Manage Plan Data Collection	The process of collecting, integrating and maintaining the accuracy of supply chain execution information necessary to plan the balance of supply chain resources to demand requirements at both the highest aggregate and lowest SKU planning levels. Each occurrence consumes time
sEP.4: Manage Integrated Supply Chain Inventory	The process of establishing total supply chain inventory strategy and planning the total inventory limits or levels (including Raw Material, Work In Process, Finished and Purchased Finished Goods) including replenishment models, ownership, product mix, and stocking locations, both inter and intra company.
sEP.5: Manage Integrated Supply Chain Capital Assets	The process of defining capacity strategy (i.e. internal versus contract manufacturing or internal versus 3rd Party Logistics) and then acquiring, maintaining and dispositioning an organization's capital assets to operate the integrated supply chain.
sEP.6: Manage Integrated Supply Chain Transportation	The process of defining an integrated supply chain transportation strategy and maintaining the information which characterizes total supply chain transportation requirements, and the management of transporters both inter and intra company.

sEP.7: Manage Planning Configuration	The process of defining and maintaining the information about a unique supply chain network for a group of similar or complimentary products through their full life cycle, including the evaluation of market need, product realization (development, introduction and production), product discontinuation, and after-market support. This element also includes the management of critical sub processes needed to manage the life cycle of individual item numbers including item masters, routings, event planning (promotions, etc.), ABC classification, rationalization, and bill of materials.
sEP.8: Manage Plan Regulatory Requirements and Compliance	The process of identifying and complying with regulatory documentation and process standards set by external entities (i.e. government, trade officials, etc.) when planning for the integrated supply chain network.
sEP.9: Manage Supply Chain Plan Risk	The process of identifying, coordinating and managing Supply Chain Risk(s) by aligning with the overall business risk management program. Supply Chain Risk is defined as any uncertainty that can affect the organization in a potentially negative fashion. The Manage Supply Chain Plan Risk enabler includes identifying the potential risk, assessing the probability and potential impact of the risk, and planning risk mitigating strategies.
sEP.10: Align Supply Chain Unit Plan with Financial Plan	The process of revising the long-term supply chain capacity and resource plans, given the inputs from the strategic and business plans. This includes revision of not only aggregate forecast and projections related to supply chain, source, make, and delivery plans, but also business assumptions.

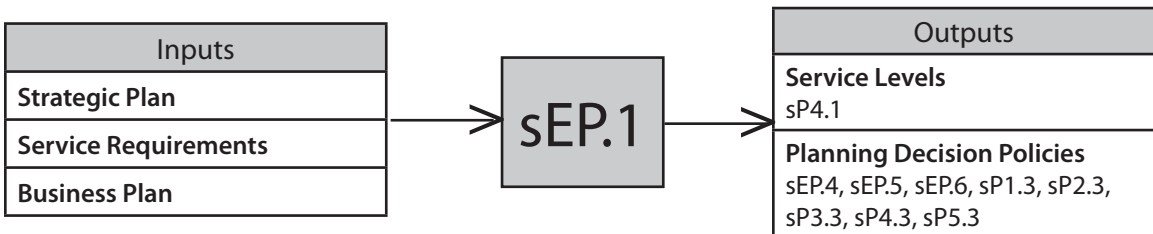


sEP.1

Manage Business Rules for Plan Process

The process of establishing, maintaining, and enforcing decision support criteria for Supply Chain Planning which translate to rules for conducting business, i.e. developing and maintaining customer and channel performance standards of an entire supply chain such as service levels, given service requirements by supply chain stakeholders/trading partners. Business rules align PLAN process policies with business strategy, goals, and objectives.

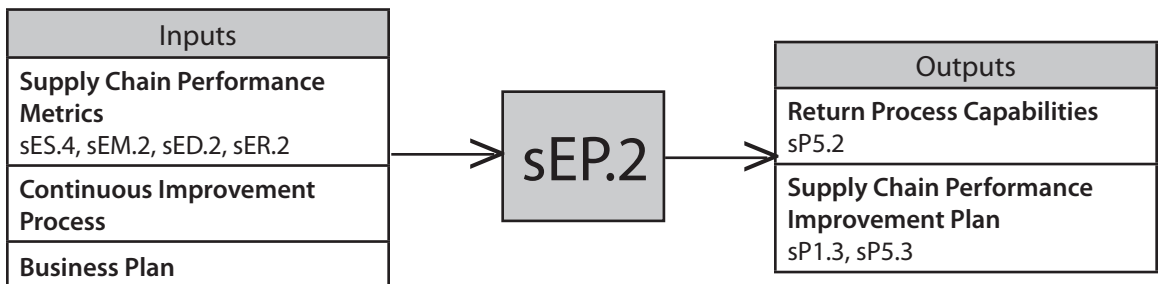
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Business Rules for Return Processes Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Business Rules for PLAN Processes
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Integrated Business and Supply-Chain Planning Processes Where Cross-Functional Input is Leveraged to Set Business Rules	Supply Chain performance dashboard capability.



Manage Performance of Supply Chain

The process of measuring actual integrated Supply Chain performance against internal and/or external standards to develop and implement a course of action to achieve targeted performance levels. Performance targets established for the execution of supply chain processes are reflected in the process elements for PLAN, i.e. cost, delivery reliability, cycle time, responsiveness, and assets.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Performance of Supply Chain Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Performance of Supply Chain
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Efficient and Effective Benchmarking Process Leveraging Cross Industry Metrics and Definitions	None identified
Sound Project Management Process and Methodology	None identified
Reliable Continuous Improvement Process and Methodology.	None identified
Manage environmental performance	Manage environmental performance of the supply chain.



Manage PLAN Data Collection

The process of collecting, integrating and maintaining the accuracy of supply chain execution information necessary to plan the balance of supply chain resources to demand requirements at both the highest aggregate and lowest SKU planning levels. Each occurrence consumes time.

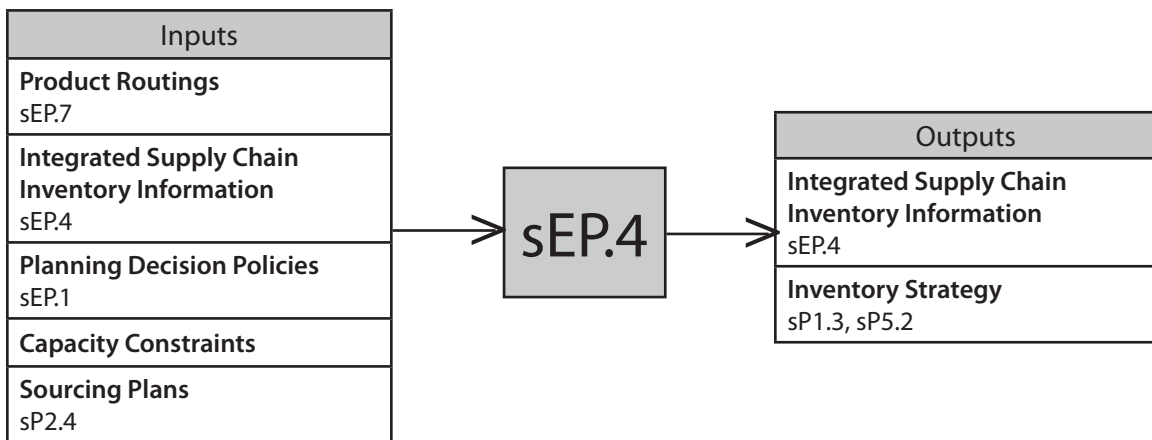
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage PLAN Data Collection Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage PLAN Data Collection
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Integrated Demand and Supply Planning - Demand Planning, Supply Planning and especially the Supply Plan Execution Are no longer disconnected. All required planning and execution data is integrated and shared in between all functional areas within an orga	Memory based planning systems provide one single data model and data mart (including the business rules) for the entire supply chain planning and execution process. Algorithms use the business rules as the driver for the planning engine.
Single Data Source for Decision Support and Business Rules	A data warehouse/data mart is the source of all planning (master) data, business rules and transaction data. Analyzing tools enable the ongoing maintenance and improvement of the business rules based on actual data.



Manage Integrated Supply Chain Inventory

The process of establishing total supply chain inventory strategy and planning the total inventory limits or levels (including Raw Material, Work In Process, Finished and Purchased Finished Goods) including replenishment models, ownership, product mix, and stocking locations, both inter and intra company.

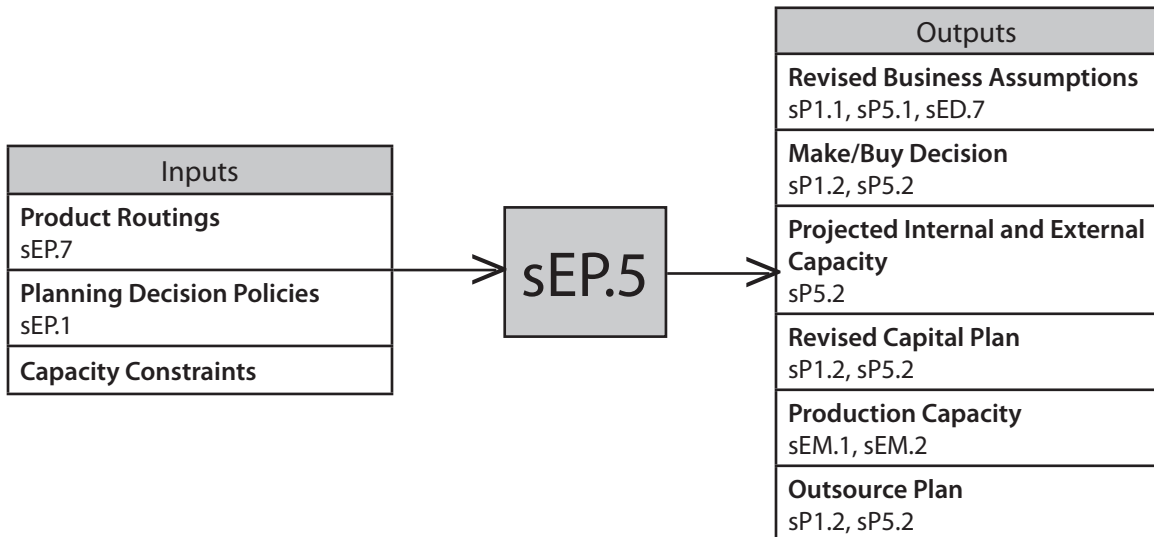
Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Manage Integrated Supply Chain Inventory Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Integrated Supply Chain Inventory
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Capability to Run Multiple “Simulated” Full-Stream Supply/ Demand Balancing Against Long-Term Capacity Plans and Scenarios	Supply Chain modeling capabilities, i.e. Advanced Planning Systems.



Manage Integrated Supply Chain Capital Assets

The process of defining capacity strategy (i.e. internal versus contract manufacturing or internal versus 3rd Party Logistics) and then acquiring, maintaining and dispositioning an organization’s capital assets to operate the integrated supply chain.

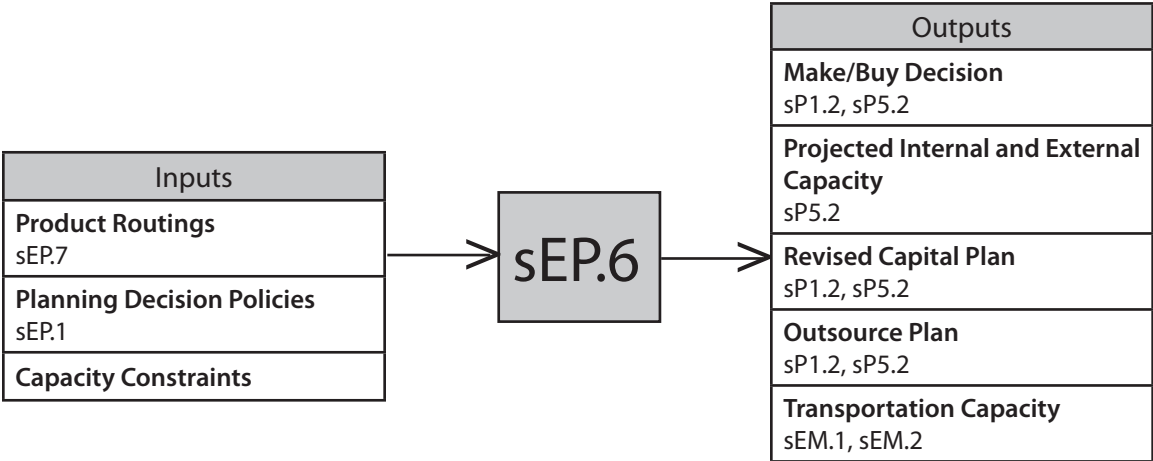
Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Manage Integrated Supply Chain Capital Assets Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Integrated Supply Chain Capital Assets
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Alignment of Strategic and Business Plans with Long-Term Capacity and Resource Planning	None identified
Use of Cross Functional Teams to Execute the Process of Developing Long-Term Capacity and Resource Plans	None identified
Factor environmental considerations into planning	Factor environmental considerations/restrictions into capacity planning
Capability to Run Multiple “Simulated” Full-Stream Supply/ Demand Balancing Against Long-Term Capacity Plans and Scenarios	Supply Chain modeling capabilities, i.e. Advanced Planning Systems.



Manage Integrated Supply Chain Transportation

The process of defining an integrated supply chain transportation strategy and maintaining the information which characterizes total supply chain transportation requirements, and the management of transporters both inter and intra company.

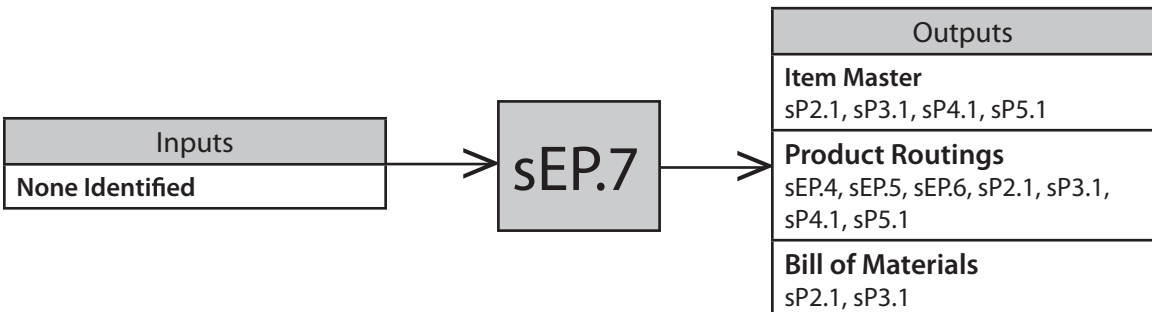
Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Manage Integrated Supply Chain Transportation Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Integrated Supply Chain Transportation
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Considerations emissions in transportation decisions	Integrate environmental emissions considerations to transportation decisions. Feature: Implement Environmental Management System
Alignment of Strategic and Business Plans with Long-Term Capacity and Resource Planning	None identified
Capability to Run "Simulated" Full-Stream Supply/Demand Balancing for "What-If" Scenarios	Supply chain modeling and visualization system
Use of Cross Functional Teams to Execute the Process of Developing Long-Term Capacity and Resource Plans	None identified



Manage Planning Configuration

The process of defining and maintaining the information about a unique supply chain network for a group of similar or complimentary products through their full life cycle, including the evaluation of market need, product realization (development, introduction and production), product discontinuation, and after-market support. This element also includes the management of critical sub processes needed to manage the life cycle of individual item numbers including item masters, routings, event planning (promotions, etc.), ABC classification, rationalization, and bill of materials.

Performance Attributes	Metric
Supply Chain Reliability	Forecast Accuracy
Supply Chain Responsiveness	Manage Planning Configuration Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Planning Configuration
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
New Items Introductions Are part of the Sales and Operations Planning Process at the General Management Business Team Level	None identified
Use of Platform Teams in the New Product Development Process	None identified
Incorporates leading practices such as Efficient Consumer Response, Collaborative Planning, Forecasting, and Replenishment, Vendor Managed Inventory, and real time point of consumption reporting.	None Identified
SKU Rationalization	None identified
ABC Classification	None identified
Material content classification	Material content classification (HAZMAT recycleable, etc.)



Manage PLAN Regulatory Requirements and Compliance

The process of identifying and complying with regulatory documentation and process standards set by external entities (i.e. government, trade officials, etc.) when planning for the integrated supply chain network.

Performance Attributes	Metric
Supply Chain Reliability	Number of notices of violation received
Supply Chain Responsiveness	Supply chain down time due to compliance issues
Supply Chain Agility	None Identified
Supply Chain Costs	Environmental Compliance Cost, Cost to Manage Plan Regulatory Requirements and Compliance, Environmental non-compliance cost
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Monitor supplier environmental compliance	Determine supplier environmental compliance performance/ Actively participate in regulation development
Environmental Management System (EMS)	Implement an Environmental Management System (EMS) to track and manage environmental performance and to track performance against regulatory requirements



Manage Supply Chain Plan Risk

The process of identifying, coordinating and managing Supply Chain Risk(s) by aligning with the overall business risk management program. Supply Chain Risk is defined as any uncertainty that can affect the organization in a potentially negative fashion. The Manage Supply Chain Plan Risk enabler includes identifying the potential risk, assessing the probability and potential impact of the risk, and planning risk mitigating strategies. This requires analysis and coordination with the assessment and mitigating activities of the other process areas (sS, sM, sD, R) as it relates to Supply side, Demand side, Internal, and External Supply Chain Risks.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	None Identified
Supply Chain Agility	Industry Benchmark Comparison (%), Options Rating (0-100%), Hedge Rating (Inventory DOS for risk management)
Supply Chain Costs	Assessment / Risk Management Costs (\$), Mitigation Cost (\$), Mitigation cost by Event (\$)
Supply Chain Asset Management	Residual Risk (\$), Mitigated Risk (\$), Individual Process Area Event Rating (EVAR) (\$), Supply / Customer / Product Base Rated (%), Event Risk (EVAR) (\$), Gross Risk (\$)
Best Practices	Description/Definition
Supply Chain Network Configured to Mitigate Risk	<p>This practice relies on a risk evaluation of the supply chain to guide the design of the supply chain network. Node locations, transportation routes, capacity size and location, number of suppliers, number of production locations, etc. are all determined in a fashion that mitigates potential disruptions to the ability to deliver product and service to the end customer.</p> <p>This practice relies on the information collected through risk identification and risk assessment processes to identify nodes that are at a high risk of disruption due to the location of the node. Location specific risks can include tactical strike risks, natural disaster risks, single point of failure risks, etc.</p>

Best Practices cont.	Description/Definition cont.
Supply Chain Business Rules Configured to mitigate risk	<p>This practice involves establishing business rules (e.g., customer priority, supplier priority, production routing, transportation routing, etc.) based on minimizing the risk to the supply chain. Under this practice, business rules are established or configured in response to the corporate risk management plan with a goal of reducing either the likelihood of a disruption occurring or the impact to the supply chain should a disruption occur.</p> <p>Business rule reconfiguration typically includes an assessment of the impact of each rule change on the overall supply chain before actual implementation.</p>
Supply Chain Risk Identification	<p>A key aspect of supply chain risk management is identification. Identification involves creating a list of potential events that could harm any aspect of the supply chain's performance. Risk identification allows an organization to take steps to create plans to manage risks before they occur. This is typically more cost effective than waiting to react to adverse events when they occur.</p>
Supply Chain Information Configured to Minimize Risk	<p>This practice involves managing supply chain information networks to minimize the risk to the supply chain. This includes information sharing with partners as well as internal locations. This helps all parties to be quickly informed of a real or potential disruption and respond quickly and appropriately to minimize the disruption impact.</p>
Supply Chain Risk Assessment	<p>Supply Chain Risk assessment provides management with an understanding of where the greatest risks may exist in order to prioritize resources for risk mitigation and management. Performing such assessments will involve clarifying the nature of the risk, understanding conditions that may lead to the event, knowing how frequently such events have happened or can be expected to happen, and the potential impact of such events. The team can then prioritize addressing the risks.</p>
Supply Chain Risk Management	<p>Supply chain risk management is the systematic identification, assessment and mitigation of potential disruptions in logistics networks with the objective to reduce their negative impact on the logistics network's performance.</p>
Supply Chain Risk Monitoring	<p>Once areas of risk have been identified, an organization needs to monitor their internal and external environment. This helps them to predict when risky events are becoming more likely. It also helps to identify new risks and is tightly linked to the best practice of Supply Chain Risk Identification.</p>

sEP.9

Best Practices cont.

Description/Definition cont.

Crisis Communications Planning

Open communication is necessary for effective risk management, where the term “open” refers to the possibility to directly reach the right person – who can better handle the information about a crisis situations – wherever in the organization.

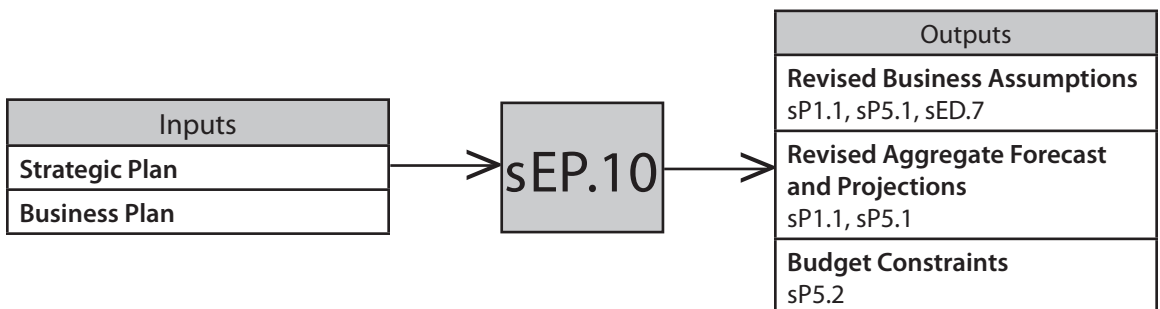
Managers require direct communication channels up, down and across their business units to help identify risks and take appropriate actions.



Align Supply Chain Unit Plan with Financial Plan

The process of revising the long-term supply chain capacity and resource plans, given the inputs from the strategic and business plans. This includes revision of not only aggregate forecast and projections related to supply chain, source, make, and delivery plans, but also business assumptions.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Align Supply Chain Unit Plan with Financial Plan Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Align Supply Chain Unit Plan with Financial Plan
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Re-Planning Process Links the Supply Chain Operation with the Business Strategy and the Marketing Strategy	None identified
Re-Planning Process Exists in Multi-Levels of the Supply-Chain between Business Enterprises	Business to business Internet capability to share common data.
Strategic Sales and Operations Planning Process in Place and Managed at the Executive Level	None identified



Source

The processes associated with ordering, delivery, receipt and transfer of raw material items, subassemblies, product and/or services.

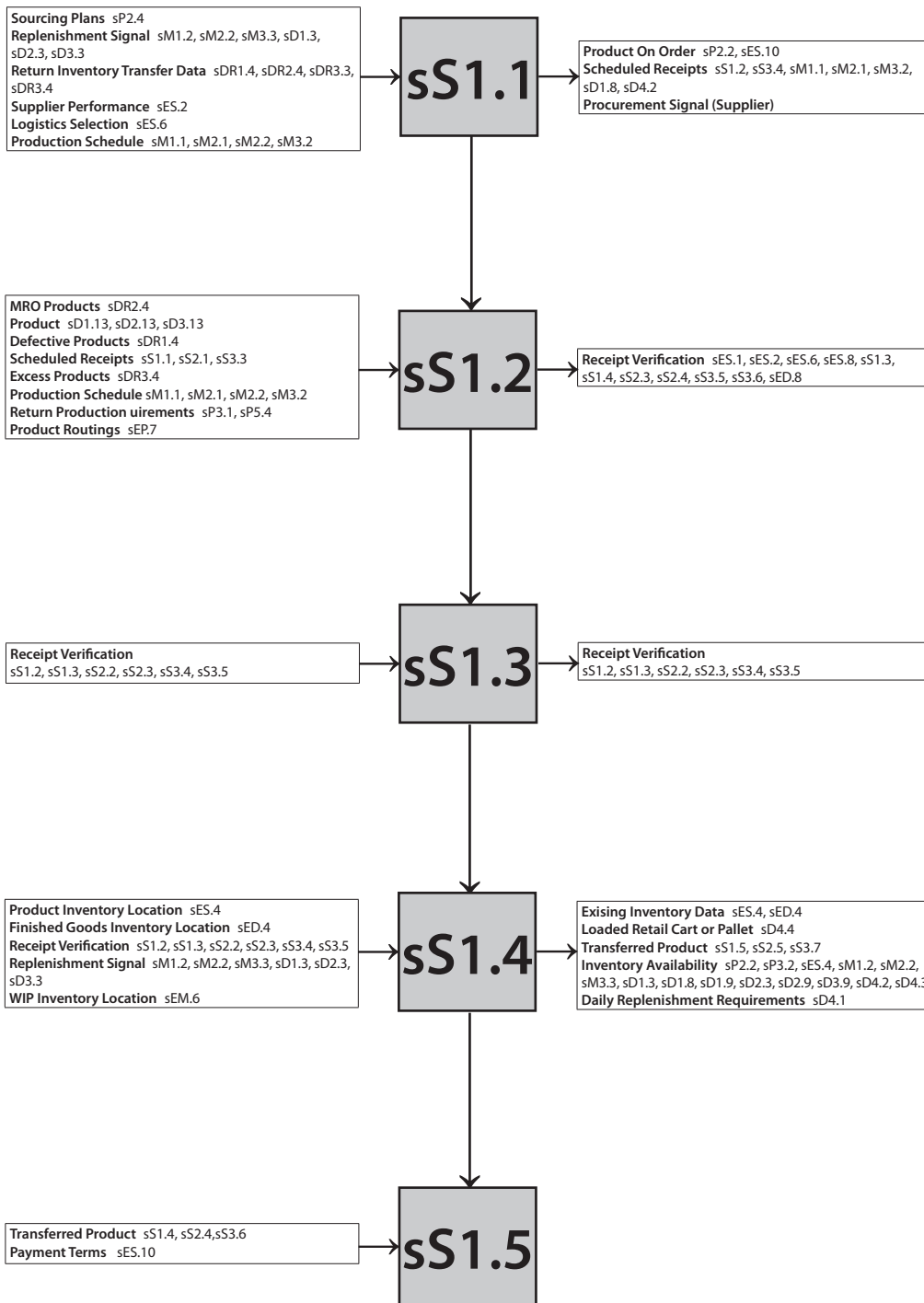
Process Categories

sS1: Source Stocked Product	The process of ordering, receiving and transferring raw material items, sub-assemblies, product and or services based on aggregated demand requirements. The intention of Source-to-Stock is to maintain a pre-determined level of inventory for these materials, sub-assemblies or products. No customer reference or customer order detail is exchanged with the supplier, attached to or marked on the product, or recorded in the warehousing or ERP system for Source-to-Stock products. Examples of alternative or related names for Source-to-Stock are: replenishment inventory, drip parts, kan-ban, andon, and bulk or generic stock.
sS2: Source Make-to-Order Product	The processes of ordering and receiving product or material that is ordered (and may be configured) only when required by a specific customer order. The intention of Source-to-Order is to maintain inventory ordered (and/or configured) specifically for customer orders only. The product is ordered, received and identified in stock using this customer order reference (order designated inventory). The product is typically identifiable throughout the sourcing process, by the reference to the customer order attached to or marked on the product or packaging and in the warehouse management or ERP system. Examples of alternative or related names for Source-to-Order are: purchase-to-order, special ordering (retail industry), kitting and line sequencing (manufacturing industries).
sS3: Source Engineer-to-Order Product	The processes of identifying and selecting sources of supply, negotiating, validating, scheduling, ordering and receiving parts, assemblies or specialized products or services that are designed, ordered and/or built based on the requirements or specifications of a specific customer order.
sES: Enable Source	The collection of processes associated with managing and monitoring Source process data, performance and relationships

Source Stocked Product

The process of ordering, receiving and transferring raw material items, sub-assemblies, product and or services based on aggregated demand requirements. The intention of Source-to-Stock is to maintain a pre-determined level of inventory for these materials, sub-assemblies or products. No customer reference or customer order detail is exchanged with the supplier, attached to or marked on the product, or recorded in the warehousing or ERP system for Source-to-Stock products. Examples of alternative or related names for Source-to-Stock are: replenishment inventory, drip parts, kan-ban, andon, and bulk or generic stock.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Source Cycle Time, Order Fulfillment Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Source, Product Acquisition Costs
Supply Chain Asset Management	Return on Supply Chain Fixed Assets, Return on Working Capital, Inventory Days of Supply (Raw Material)
Best Practices	Description/Definition
Select suppliers with EMS	Select suppliers with active EMS systems
Joint Service Agreements (JSA)	Collaborative Planning Systems
Utilize green purchasing practices	Utilize green purchasing practices

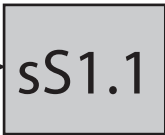


Schedule Product Deliveries

Scheduling and managing the execution of the individual deliveries of product against an existing contract or purchase order. The requirements for product releases are determined based on the detailed sourcing plan or other types of product pull signals.

Performance Attributes	Metric
Supply Chain Reliability	% Schedules Changed within Supplier's Lead Time
Supply Chain Responsiveness	Average Release Cycle of Changes, Average Days per Engineering Change, Schedule Product Deliveries Cycle Time, Average Days per Schedule Change
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Schedule Product Deliveries, Quantity per shipment
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Bundle deliveries	Bundle deliveries of different products into single shipment when possible
Infrequent product delivery	Minimize need for frequent shipments by accurately determining product needs
Mechanical (Kanban) Pull Signals Are Used to Notify Suppliers of the Need to Deliver Product	Electronic Kanban support
Supplier managed inventories with scheduling interfaces to external supplier systems	VMI agreements allow suppliers to manage (replenish) inventory
Utilize EDI Transactions to Reduce Cycle Time and Costs	EDI interface for 830, 850, 856 & 862 transactions
Advanced Ship Notices Allow for Tight Synchronization between Source and Make Processes	Blanket order support with scheduling interfaces to external supplier systems
Consignment Agreements Are Used to Reduce Assets and Cycle Time While Increasing the Availability of Critical Items	Consignment inventory management

Inputs
Sourcing Plans sP2.4
Replenishment Signal sM1.2, sM2.2, sM3.3, sD1.3, sD2.3, sD3.3
Return Inventory Transfer Data sDR1.4, sDR2.4, sDR3.3, sDR3.4
Supplier Performance sES.2
Logistics Selection sES.6
Production Schedule sM1.1, sM2.1, sM2.2, sM3.2

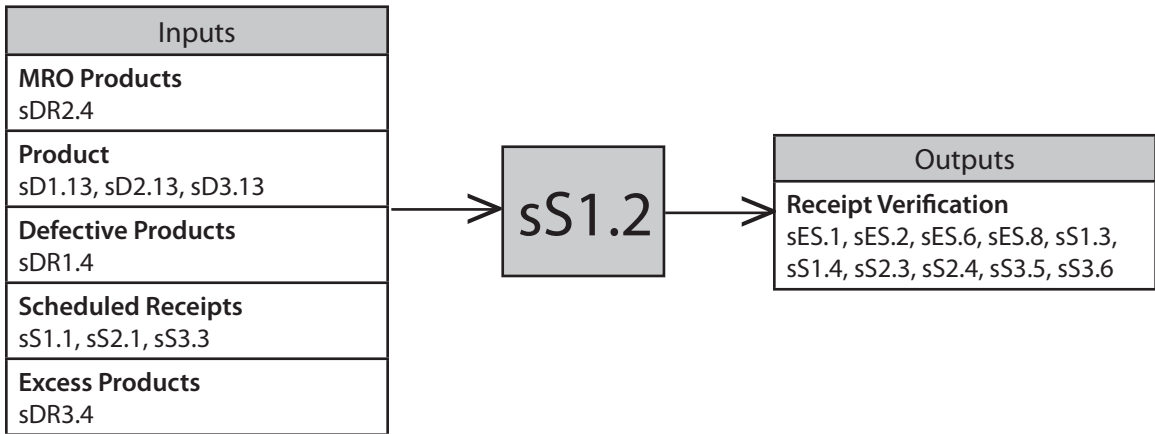


Outputs
Product On Order sP2.2, sES.10
Scheduled Receipts sS1.2, sS3.4, sM1.1, sM2.1, sM3.2, sD1.8, sD4.2
Procurement Signal (Supplier)

Receive Product

The process and associated activities of receiving product to contract requirements.

Performance Attributes	Metric
Supply Chain Reliability	% Orders/ Lines Processed Complete, % Orders/ Lines Received On-Time To Demand Requirement, % Orders/ Lines Received with Correct Shipping Documents, % Orders/ lines received with correct packaging
Supply Chain Responsiveness	Receiving Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Deliveries Are Balanced Throughout Each Working Day and Throughout the Week	None identified
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Supplier Delivers Directly to Point of Use	Electronic Tag tracking to Point of Use (POU) destination
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices. • Generate bar coded receiving documents. • Product serial number used as identifier. • RFID
Supplier Certification Programs Are Used to Reduce (Skip Lot) or Eliminate Receiving Inspection	Skip lot/sampling inspection logic
Carrier Agreement	Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions.



sS1.3

Verify Product

The process and actions required determining product conformance to requirements and criteria.

Performance Attributes	Metric
Supply Chain Reliability	% Orders/ Lines Received Defect Free, % Orders/ lines received with correct content
Supply Chain Responsiveness	Verify Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Verify Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Supplier Replaces Defective Material at Customer's Facility with Good Product as Required	Electronic Tag tracking to Point of Use (POU) destination
Supplier Certification Programs Are Used to Reduce (Skip Lot) or Eliminate Receiving Inspection	Skip lot/sampling inspection logic
Monitor product compliance	Review product for compliance with environmental specifications, including product packaging
Deliveries Are Balanced Throughout Each Working Day and Throughout the Week	None identified
Supplier Delivers Directly to Point of Use	Electronic Tag tracking to Point of Use (POU) destination
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices • Generate bar coded receiving documents • Product serial number used as identifier. • RFID

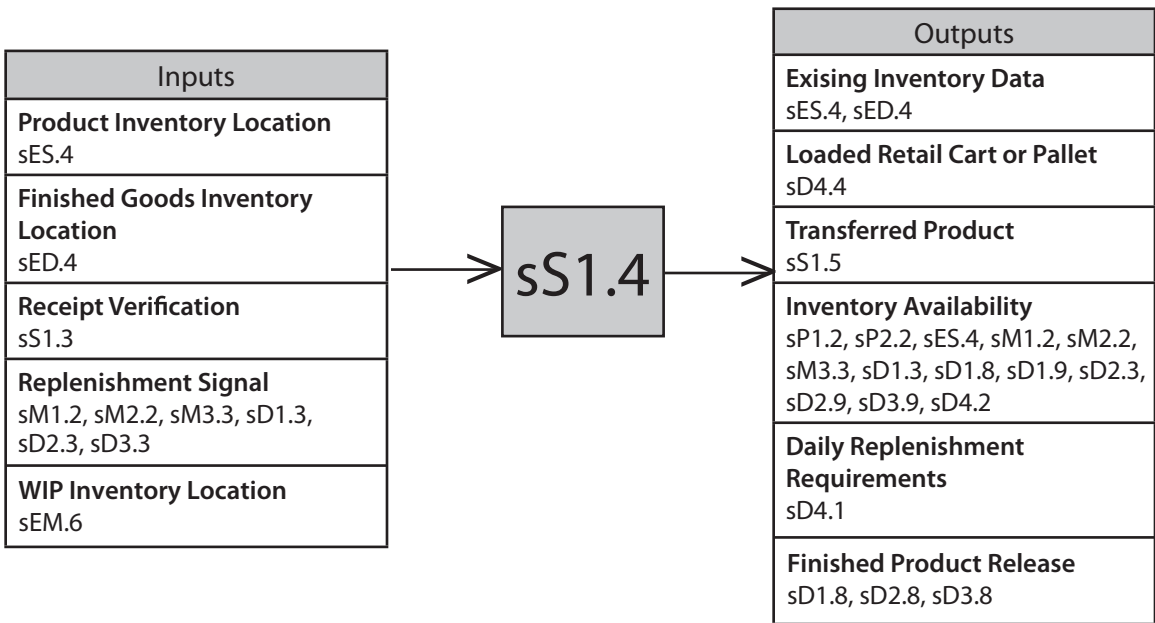


Transfer Product

The transfer of accepted product to the appropriate stocking location within the supply chain. This includes all of the activities associated with repackaging, staging, transferring and stocking product. For service this is the transfer or application of service to the final customer or end user.

Performance Attributes	Metric
Supply Chain Reliability	% Product Transferred On-Time to Demand Requirement, % Product Transferred without Transaction Errors
Supply Chain Responsiveness	Transfer Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Energy Costs, Cost to Transfer Product, Product Packaging costs, % of vehicle fuel derived from alternative fuels, Packaging purchases, Quantity per shipment
Supply Chain Asset Management	Inventory Days of Supply
Best Practices	Description/Definition
Drive Deliveries Directly to Stock or Point-Of-Use in Manufacturing to Reduce Costs and Cycle Time	Pay on receipt. Specify delivery location and time (to the minute).Specify delivery sequence
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Utilize alternative fuel vehicles	Utilize alternative fuel vehicles
Utilize high efficiency vehicles	Utilize high fuel efficiency vehicles
Capability Transfer to Organization	None identified

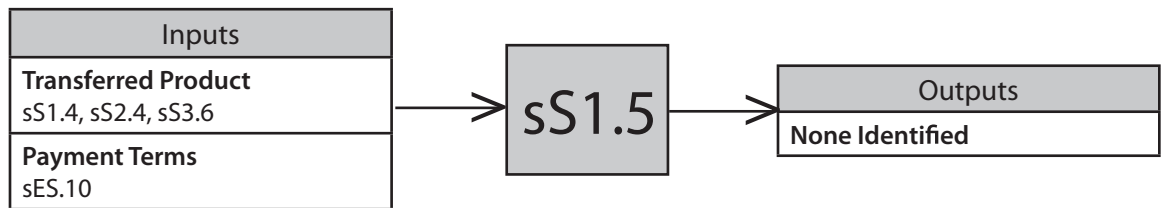
sS1.4



Authorize Supplier Payment

The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.

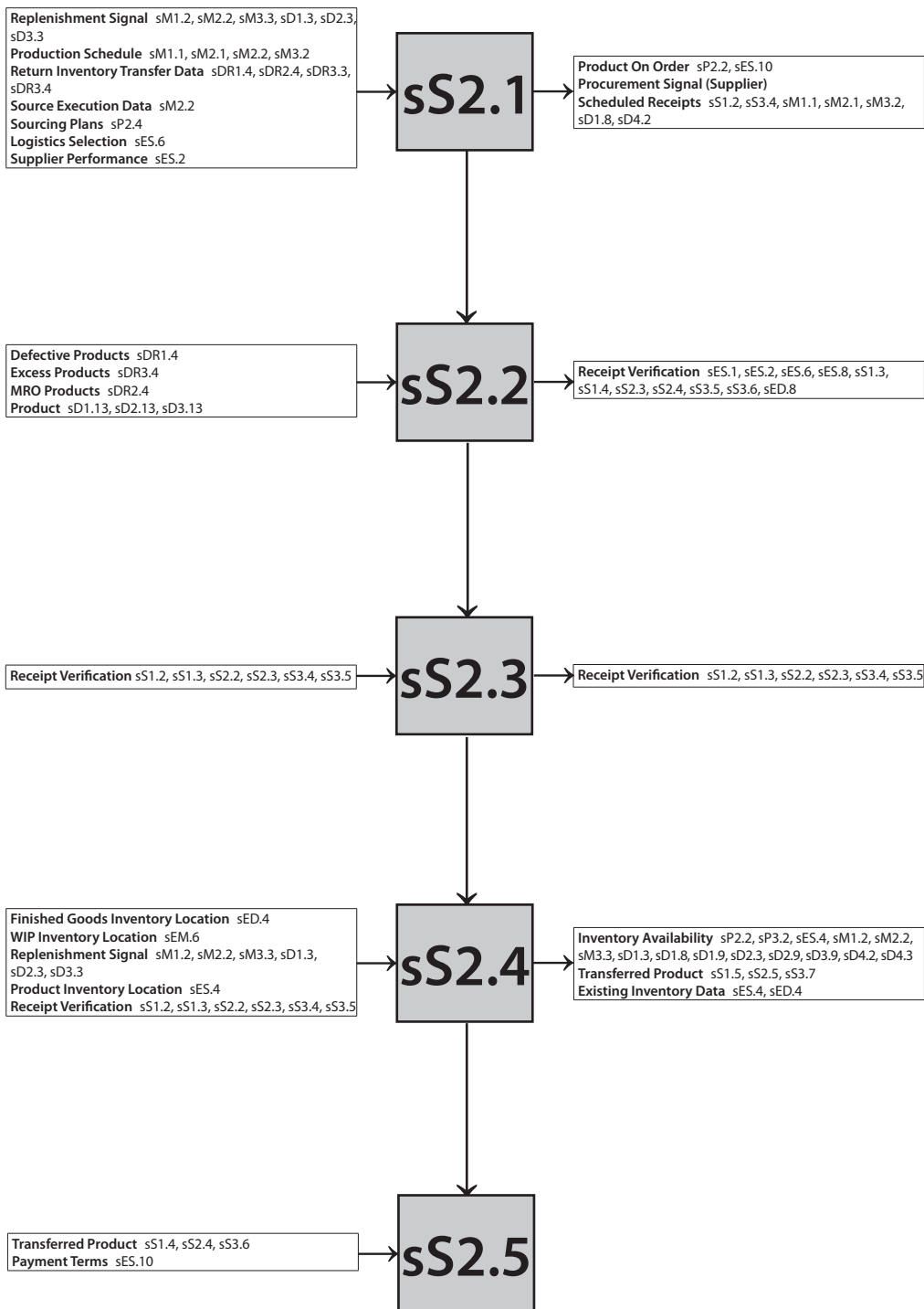
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Authorize Supplier Payment Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Authorize Supplier Payment
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Pay on Receipt	Electronic Invoice Processing



Source Make-to-Order Product

The processes of ordering and receiving product or material that is ordered (and may be configured) only when required by a specific customer order. The intention of Source-to-Order is to maintain inventory ordered (and/or configured) specifically for customer orders only. The product is ordered, received and identified in stock using this customer order reference (order designated inventory). The product is typically identifiable throughout the sourcing process, by the reference to the customer order attached to or marked on the product or packaging and in the warehouse management or ERP system. Examples of alternative or related names for Source-to-Order are: purchase-to-order, special ordering (retail industry), kitting and line sequencing (manufacturing industries).

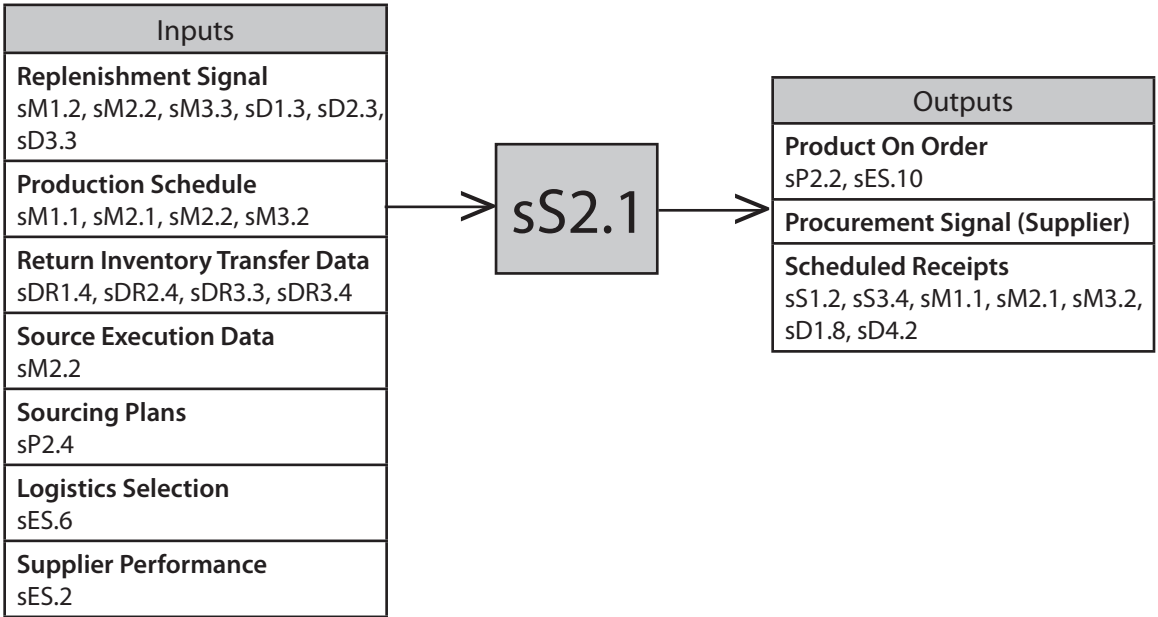
Performance Attributes	Metric
Supply Chain Reliability	Perfect Order Fulfillment
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Source Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Product Acquisition Costs, Cost to Source
Supply Chain Asset Management	Inventory Days of Supply (Raw Material), Return on Working Capital, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
Joint Service Agreements (JSA)	Collaborative Planning Systems
Select suppliers with EMS	Select suppliers with active EMS systems
Automated Statistical Process Control (SPC)	None identified
Utilize green purchasing practices	Utilize green purchasing practices



Schedule Product Deliveries

Scheduling and managing the execution of the individual deliveries of product against the contract. The requirements for product deliveries are determined based on the detailed sourcing plan. This includes all aspects of managing the contract schedule including prototypes, qualifications or service deployment.

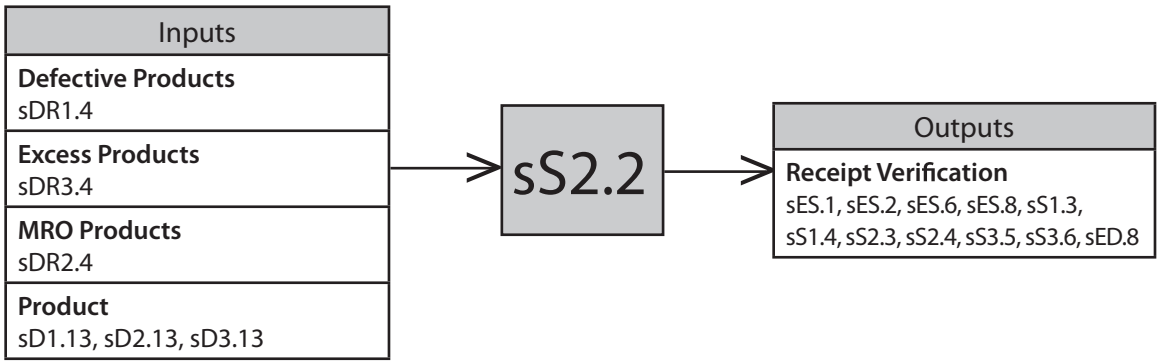
Performance Attributes	Metric
Supply Chain Reliability	% Schedules Changed within Supplier's Lead Time
Supply Chain Responsiveness	Average Release Cycle of Changes, Average Days per Schedule Change, Average Days per Engineering Change, Schedule Product Deliveries Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Schedule Product Deliveries, Quantity per shipment
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Utilize EDI Transactions to Reduce Cycle Time and Costs	EDI interface for 830, 850, 856 & 862 transactions
Mechanical (Kanban) Pull Signals Are Used to Notify Suppliers of the Need to Deliver Product	Electronic Kanban support
Infrequent product delivery	Minimize need for frequent shipments by accurately determining product needs
Consignment Agreements Are Used to Reduce Assets and Cycle Time While Increasing the Availability of Critical Items	Consignment inventory management
Bundle deliveries	Bundle deliveries of different products into single shipment when possible
Advanced Ship Notices Allow for Tight Synchronization between Source and Make Processes	Blanket order support with scheduling interfaces to external supplier systems
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.



Process Element: Receive Product

The process and associated activities of receiving product to contract requirements.

Performance Attributes	Metric
Supply Chain Reliability	% Orders/ Lines Received On-Time To Demand Requirement, % Orders/ Lines Processed Complete, % Orders/ lines received with correct packaging, % Orders/ Lines Received with Correct Shipping Documents
Supply Chain Responsiveness	Receiving Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices. • Generate bar coded receiving documents. • Product serial number used as identifier. • RFID
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Supplier Certification Programs Are Used to Reduce (Skip Lot) or Eliminate Receiving Inspection	Skip lot/sampling inspection logic
Deliveries Are Balanced Throughout Each Working Day and Throughout the Week	None identified
Supplier Delivers Directly to Point of Use	Electronic Tag tracking to Point of Use (POU) destination



sS2.3

Verify Product

The process and actions required determining product conformance to requirements and criteria.

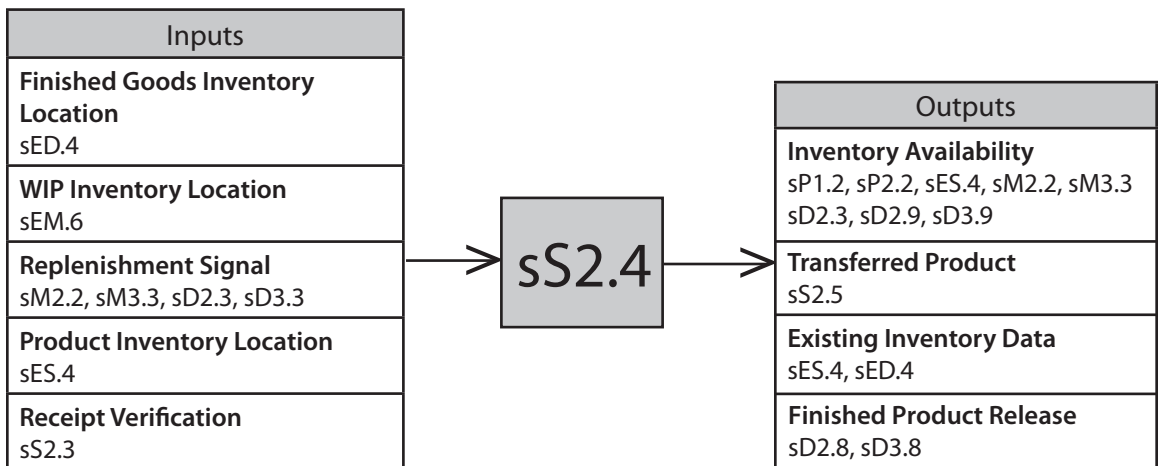
Performance Attributes	Metric
Supply Chain Reliability	% Orders/ Lines Received Defect Free, % Orders/ lines received with correct content
Supply Chain Responsiveness	Verify Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Verify Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Deliveries Are Balanced Throughout Each Working Day and Throughout the Week	None identified
Supplier Delivers Directly to Point of Use	Electronic Tag tracking to Point of Use (POU) destination
Monitor product compliance	Review product for compliance with environmental specifications, including product packaging
Supplier Replaces Defective Material at Customer’s Facility with Good Product as Required	Electronic Tag tracking to Point of Use (POU) destination
Supplier Certification Programs Are Used to Reduce (Skip Lot) or Eliminate Receiving Inspection	Skip lot/sampling inspection logic
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices • Generate bar coded receiving documents. • Product serial number used as identifier. • RFID
Supplier Delivers Directly to Point of Use	Electronic Tag tracking to Point of Use (POU) destination



Transfer Product

The transfer of accepted product to the appropriate stocking location within the supply chain. This includes all of the activities associated with repackaging, staging, transferring, and stocking product and or application of service.

Performance Attributes	Metric
Supply Chain Reliability	% Product Transferred On-Time to Demand Requirement, % Product Transferred without Transaction Errors
Supply Chain Responsiveness	Transfer Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Energy Costs, Cost to Transfer Product
Supply Chain Asset Management	Inventory Days of Supply
Best Practices	Description/Definition
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Utilize high efficiency vehicles	Utilize high fuel efficiency vehicles
Drive Deliveries Directly to Stock or Point-Of-Use in Manufacturing to Reduce Costs and Cycle Time	Pay on receipt. Specify delivery location and time (to the minute).Specify delivery sequence
Capability Transfer to Customer	None identified
Utilize alternative fuel vehicles	Utilize alternative fuel vehicles

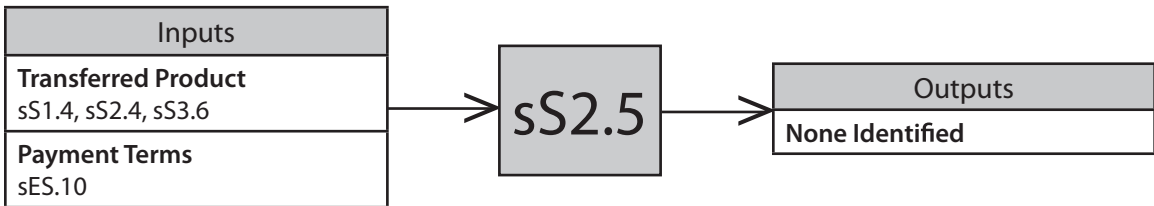


sS2.5

Authorize Supplier Payment

The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.

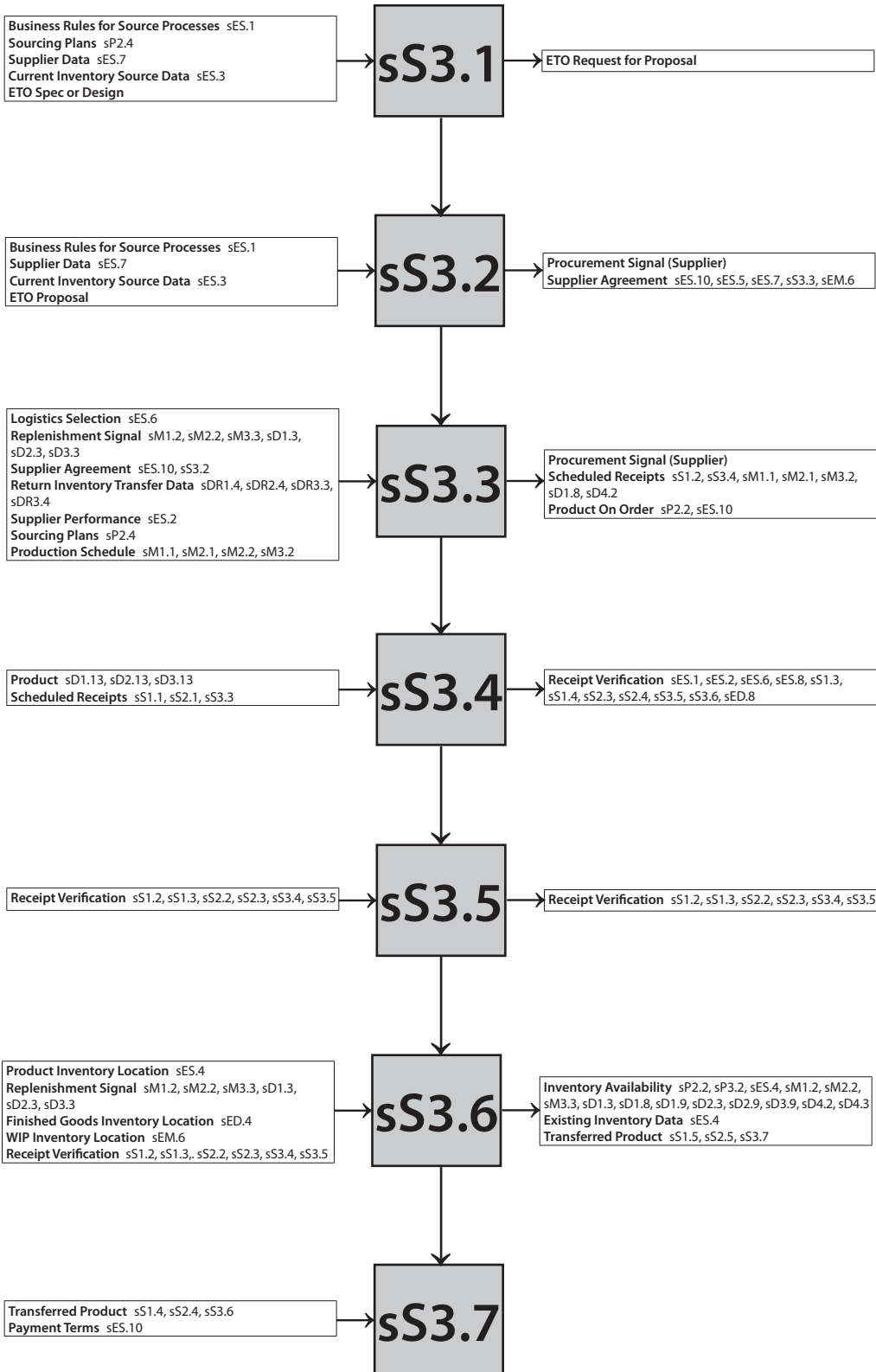
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Authorize Supplier Payment Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Authorize Supplier Payment
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Pay on Receipt	Electronic Invoice Processing



Source Engineerto-Order Product

The processes of identifying and selecting sources of supply, negotiating, validating, scheduling, ordering and receiving parts, assemblies or specialized products or services that are designed, ordered and/or built based on the requirements or specifications of a specific customer order.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Source Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Source, Product Acquisition Costs
Supply Chain Asset Management	Return on Supply Chain Fixed Assets, Return on Working Capital, Inventory Days of Supply (Raw Material)
Best Practices	Description/Definition
Select suppliers with EMS	Select suppliers with active EMS systems
Utilize green purchasing practices	Utilize green purchasing practices
Joint Service Agreements (JSA)	Collaborative Planning Systems

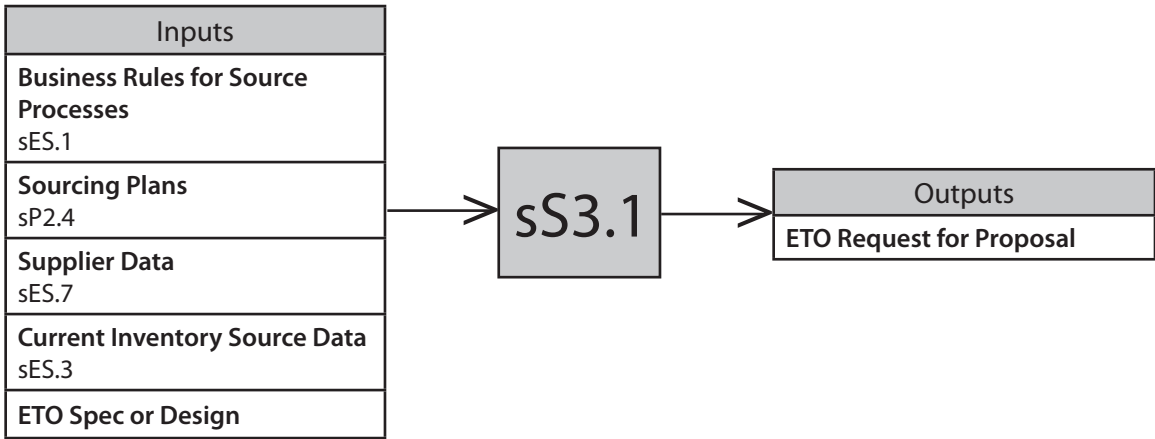


Identify Sources of Supply

The identification and qualification of potential suppliers capable of designing and delivering product that will meet all of the required product specifications.

Performance Attributes	Metric
Supply Chain Reliability	% of suppliers with an EMS or ISO 14001 certification
Supply Chain Responsiveness	Identify Sources of Supply Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Identify Sources of Supply
Supply Chain Asset Management	% of material that has a valid "Take-back" program, % of materials that are recyclable/ reusable
Best Practices	Description/Definition
Product Data Management & Electronic Document Management Are Used to Manage Technical Documents and Requirements for Engineer to Order Product	None identified
Electronic Data Interchange is Used to Send Technical Information to and from Potential Suppliers	None identified
On Line RFQ Processes Linked into the Document Management Process Reduces Cycle Time and Product Management Costs	None identified
Purchase recycled product	Purchase products from recyclers or remanufactures
Concurrent Engineering is Used to Tightly Link Sourcing into the Product Development Process Make/Buy Decision Process (Outsourcing vs. In Sourcing)	None identified
Purchase previously used supplies	Purchase previously used supplies
Supplier Development Programs Are Used to Get Local Suppliers to Invest in Developing New Technologies	None identified

sS3.1

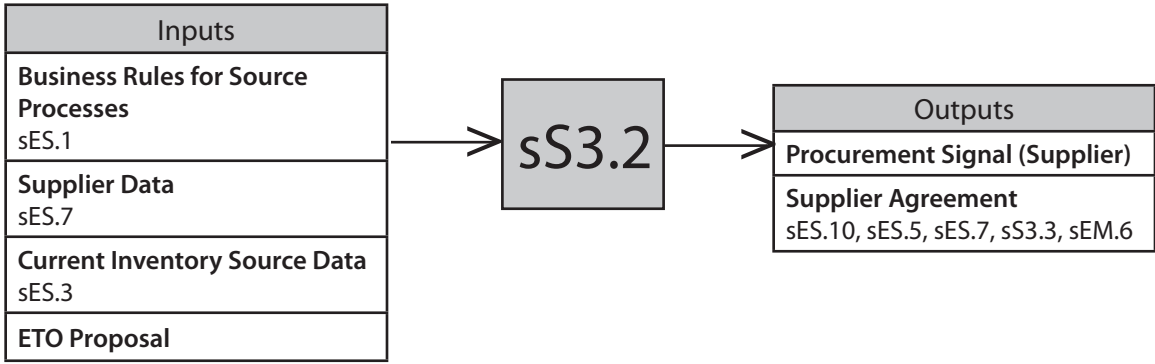


Select Final Supplier (s) and Negotiate

The identification of the final supplier(s) based on the evaluation of RFQs, supplier qualifications and the generation of a contract defining the costs and terms and conditions of product availability.

Performance Attributes	Metric
Supply Chain Reliability	% of suppliers with an EMS or ISO 14001 certification
Supply Chain Responsiveness	Select Supplier and Negotiate Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Select Final Supplier(s) and Negotiate
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Select firms with EMS	Select firms that have implemented an EMS
Utilize Concurrent Engineering with Suppliers to Allow Them to Provide Engineering and Product Performance Test Data	None identified
Select ISO 14001 firms	Select firms that are ISO 14001 certified or similar
Product "take-back" programs	Select firms that offer product "take-back" programs
On Line Document Management and Automated Supplier Approval Processes Can Reduce the Cycle Time and Costs Associated With Managing Supplier Evaluations and Get Them into the Supplier Network Faster	ERP
Electronic Data Interchange Can Be Used To Send Rfqs and Technical Information to and from Potential Suppliers to Determine Supplier Capability to Fulfill Requirements So that They May Be Added to Supplier Network	Electronic Data Interchange
Supplier Certification Programs Can Reduce the Cycle Time for Certifying Existing Suppliers to Provide New Technologies	None identified
On Line RFQ Processes Linked into the Document Management Process Reduces Cycle Time and Product Management Costs	None identified
On-Line Availability to Supplier Financials to Determine Potential Supplier Viability to be Added to Supplier Network	Internet web sites for financial evaluation

sS3.2

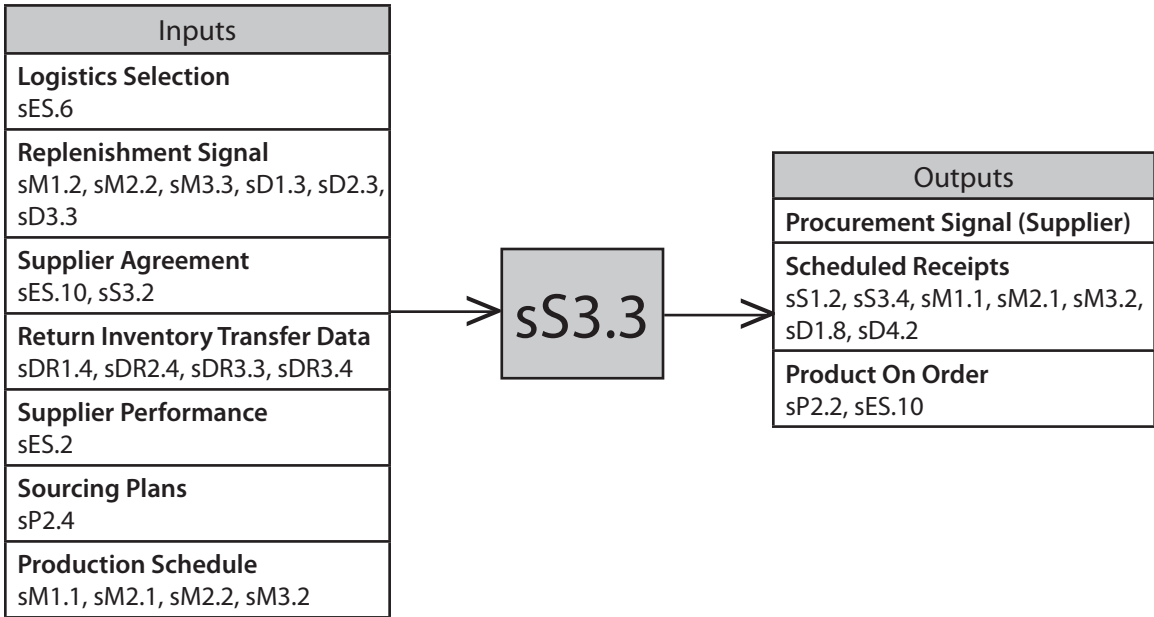


Schedule Product Deliveries

Scheduling and managing the execution of the individual deliveries of product against the contract. The requirements for product deliveries are determined based on the detailed sourcing plan. This includes all aspects of managing the contract schedule including prototypes and qualifications.

Performance Attributes	Metric
Supply Chain Reliability	% Schedules Changed within Supplier's Lead Time
Supply Chain Responsiveness	Average Release Cycle of Changes, Schedule Product Deliveries Cycle Time, Average Days per Engineering Change, Average Days per Schedule Change
Supply Chain Agility	None Identified
Supply Chain Costs	Quantity per shipment, Cost to Schedule Product Deliveries
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Mechanical (Kanban) Pull Signals Are Used to Notify Suppliers of the Need to Deliver Product	Electronic Kanban support
Infrequent product delivery	Minimize need for frequent shipments by accurately determining product needs
Bundle deliveries	Bundle deliveries of different products into single shipment when possible
Utilize EDI Transactions to Reduce Cycle Time and Costs	EDI interface for 830, 850, 856 & 862 transactions
Advanced Ship Notices Allow for Tight Synchronization between Source and Make Processes	Blanket order support with scheduling interfaces to external supplier systems
Consignment Agreements Are Used to Reduce Assets and Cycle Time While Increasing the Availability of Critical Items	Consignment inventory management

sS3.3

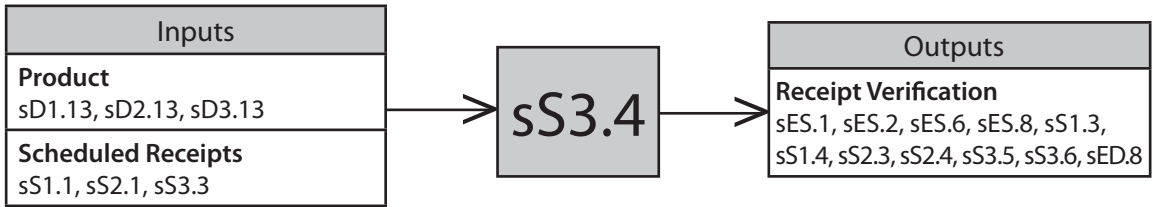


Receive Product

The process and associated activities of receiving product to contract requirements.

Performance Attributes	Metric
Supply Chain Reliability	% Orders/ Lines Processed Complete, % Orders/ Lines Received with Correct Shipping Documents, % Orders/ lines received with correct packaging, % Orders/ Lines Received On-Time To Demand Requirement
Supply Chain Responsiveness	Receiving Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Supplier Delivers Directly to Point of Use - (Dock to Line or End Destination)	Electronic Tag tracking to Point of Use (POU) destination
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices. • Generate bar coded receiving documents. • Product serial number used as identifier. • RFID
Deliveries Are Balanced Throughout Each Working Day and Throughout the Week	None identified
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Supplier Certification Programs Are Used to Reduce (Skip Lot) or Eliminate Receiving Inspection	Skip lot/sampling inspection logic
Carrier Agreement	Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions.

sS3.4



Verify Product

The process and actions required determining product conformance to requirements and criteria.

Performance Attributes	Metric
Supply Chain Reliability	% Orders/ lines received with correct content, % Orders/ Lines Received Defect Free
Supply Chain Responsiveness	Verify Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Verify Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Supplier Certification Programs Are Used to Reduce (Skip Lot) or Eliminate Receiving Inspection	Skip lot/sampling inspection logic
Supplier Replaces Defective Material at Customer’s Facility with Good Product as Required	Electronic Tag tracking to Point of Use (POU) destination
Deliveries Are Balanced Throughout Each Working Day and Throughout the Week	None identified
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices. • Generate bar coded receiving documents. • Product serial number used as identifier. • RFID
Supplier Delivers Directly to Point of Use	Electronic Tag tracking to Point of Use (POU) destination
Monitor product compliance	Review product for compliance with environmental specifications, including product packaging

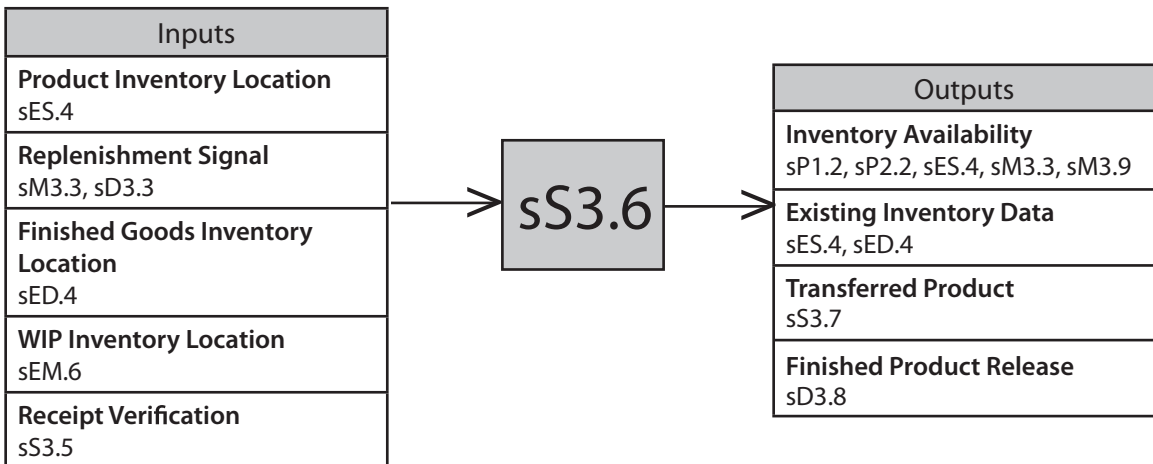


sS3.6

Transfer Product

The transfer of accepted product to the appropriate stocking location within the supply chain. This includes all of the activities associated with repackaging, staging, transferring, and stocking product.

Performance Attributes	Metric
Supply Chain Reliability	% Product Transferred without Transaction Errors, % Product Transferred On-Time to Demand Requirement
Supply Chain Responsiveness	Transfer Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Transfer Product, Energy Costs
Supply Chain Asset Management	Inventory Days of Supply
Best Practices	Description/Definition
Drive Deliveries Directly to Stock or Point-Of-Use in Manufacturing to Reduce Costs and Cycle Time	Pay on receipt. Specify delivery location and time (to the minute).Specify delivery sequence
Utilize high efficiency vehicles	Utilize high fuel efficiency vehicles
Utilize alternative fuel vehicles	Utilize alternative fuel vehicles
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Capability Transfer to Organization	None identified



Authorize Supplier Payment

The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Authorize Supplier Payment Cycle Time
Supply Chain Reliability	None Identified
Supply Chain Costs	Cost to Authorize Supplier Payment
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Pay on Receipt	Electronic Invoice Processing



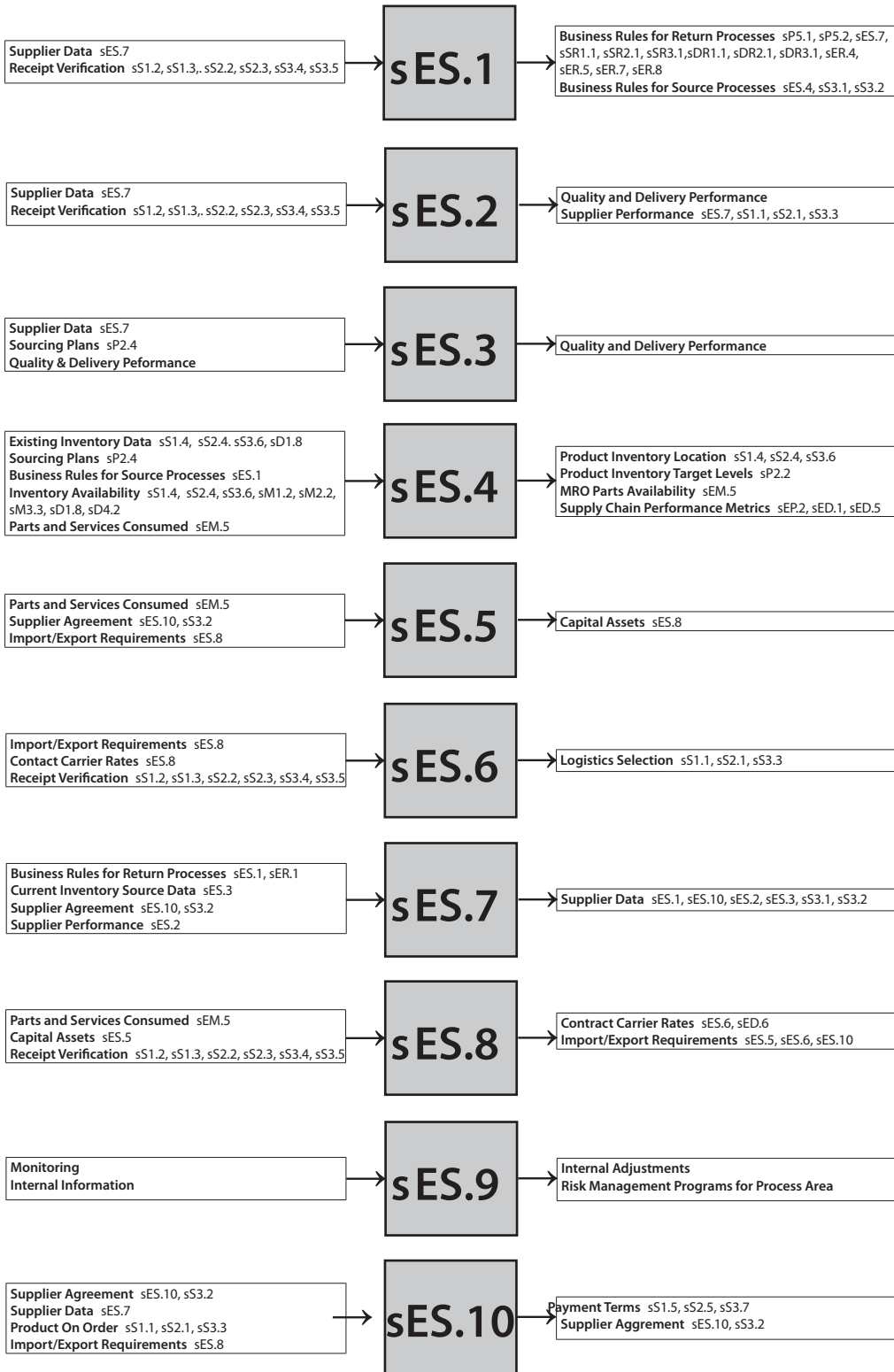
Enable Source

The collection of processes associated with managing and monitoring Source process data, performance and relationships.

Process Categories

sES.1: Manage Sourcing Business Rules	The process of defining requirements and establishing, maintaining and enforcing decision support criteria, in alignment with business strategy, goals and objectives. The business strategy defines the criteria for sourcing business rules that are translated into guidelines and policies for conducting business within the enterprise and other legal entities. Sourcing business rules include: supplier selection and negotiation processes, fulfillment and delivery performance and relationship definition for specific levels of collaboration and partnership.
sES.2: Assess Supplier Performance	The process of measuring actual supplier performance against internal and/or external standards, providing feedback to achieve and maintain the performance required to meet the customers' business and/or competitive needs
sES.3: Maintain Source Data	The process of collecting, sorting, defining hierarchy and managing configuration control of supplier information and source data that are required to make sourcing and related planning and manufacturing decisions. Source data to be maintained includes supplier profile data, financials, quality and delivery performance, spend analysis at various levels of the enterprise, from major business units to material part number
sES.4: Manage Product Inventory	The process of establishing and maintaining physical inventories and inventory information. This includes warehouse management, cycle counting, physical inventories and inventory reconciliation. For Services, this may include tracking the number of service providers and the financial resources committed at any given point in time.
sES.5: Manage Capital Assets	The process of acquiring, maintaining and dispositioning an organization's capital assets located at a supplier's facility and/or outside source, which are used to operate the supply chain.
sES.6: Manage Incoming Product	The process of defining and maintaining the information that characterizes inbound logistics management of all supplier deliveries, including both physical and electronic goods and services. This includes carrier selection and management, tracking deliveries and import

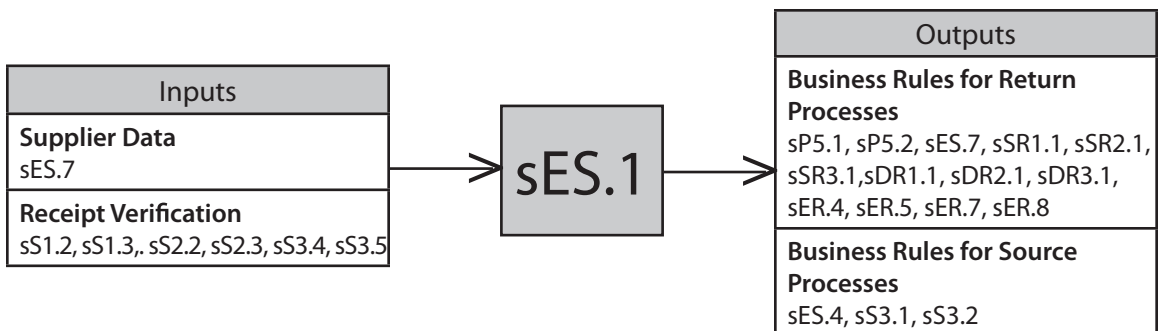
sES.7: Manage Supplier Network	The process of defining and maintaining a unique network of suppliers to deliver a specific product set. This includes establishment of a new supplier or maintaining an existing supplier and all the tasks and activities associated with identifying and qualifying the supplier and finalizing on the sourcing terms and conditions. Also, the management of a supplier certification process, which includes certifying new suppliers and maintaining the current status of existing suppliers.
sES.8: Manage Import/Export Requirements	The process of identifying and complying with import/export regulatory documentation and process standards set by external entities (eg, government).
sES.9: Manage Supply Chain Source Risk	The process of managing Source risks within an overall Supply Chain Risk Program. This includes identifying and assessing Source risks as well as planning and implementing responses to Source risks. Source risks include potential events that could impact the organization's or the suppliers's ability to deliver raw material in a timely manner at a reasonable cost with acceptable quality. Risk Management includes: migration, either reducing the impact of a risk event or reducing the likelihood of its occurrence.
sES.10: Manage Supplier Agreements	The management of existing purchase orders or supplier contracts. This includes managing volume/step pricing, resolving issues, enforcing terms and conditions and maintaining an accurate status for existing purchase orders or contracts.



Manage Sourcing Business Rules

The process of defining requirements and establishing, maintaining and enforcing decision support criteria, in alignment with business strategy, goals and objectives. The business strategy defines the criteria for sourcing business rules that are translated into guidelines and policies for conducting business within the enterprise and other legal entities. Sourcing business rules include: supplier selection and negotiation processes, fulfillment and delivery performance and relationship definition for specific levels of collaboration and partnership.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Sourcing Business Rules Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Sourcing Business Rules
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Optimized Supply-Chain Processes, Optimized Supplier Count, Supplier and Part Rationalization	Web based access to preferred and recommended suppliers, supplier performance data & spend data stratified by commodity, business unit/site, supplier, part type, process type
Collaborative environmental management processes	Collaborative environmental management processes with suppliers, including EMS integration
Long Term Supplier Agreements/ Partnerships	Electronic rules for business relationships and transactions: Vendor-managed Inventory Agreements, Fab & Hold Agreements, Just-In-Time Agreements.
Enterprise Level Policies/Rules with Local Execution	Web based access to enterprise level business rules
Electronic Sourcing and Negotiation	Business Rules for electronic sourcing process and hierarchy
Enterprise Level Spend Analysis	None identified

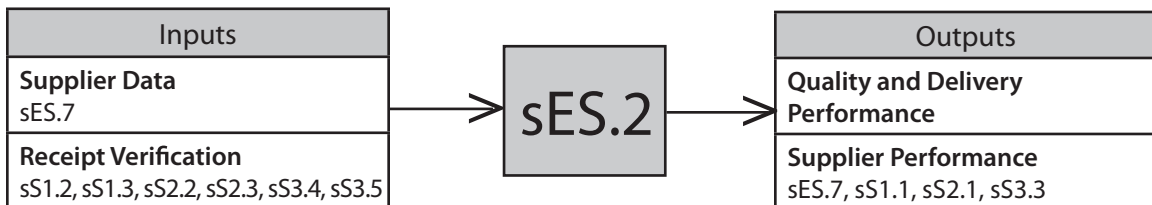


Assess Supplier Performance

The process of measuring actual supplier performance against internal and/or external standards, providing feedback to achieve and maintain the performance required to meet the customers' business and/or competitive needs.

Performance Attributes	Metric
Supply Chain Reliability	% of suppliers meeting environmental metrics/criteria
Supply Chain Responsiveness	Assess Supplier Performance Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Assess Supplier Performance
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Comparative Analysis of Supplier Performance is Used in Sourcing Decisions	Software application with data analysis capability
Supplier "Cost of Nonconformance" Data is Collected, Analyzed and Used in Performance Reporting	Software application to automate data collection and reporting
Cost Reduction and or Cost Avoidance Are Opportunities Are Identified, Implemented and measured on a Periodic Basis	None identified
Supplier environmental performance criteria	Develop a set of environmental performance criteria for all suppliers
Performance Expectations and Business Rules Are Clearly Communicated Prior to the Initiation of Business with the Supplier	Web based access / availability to business rules and performance criteria
Develop supplier partnerships	Develop a partnership with suppliers to help them implement and maintain environmentally sustainable business practices
Supplier Performance Assessment System	"Assess Supplier Performance" is the process of measuring actual supplier performance against internal and/or external standards, providing feedback to achieve and maintain the performance required to meet the customers' business and/or competitive needs.
Continuous Improvement and Development is Driven and Measured through the Performance Review Process	None identified

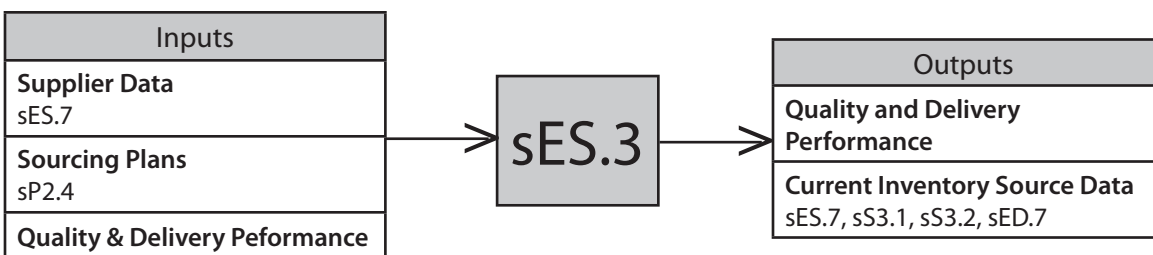
Best Practices cont.	Description/Definition cont.
Carrier Agreement	Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions.



Maintain Source Data

The process of collecting, sorting, defining hierarchy and managing configuration control of supplier information and source data that are required to make sourcing and related planning and manufacturing decisions. Source data to be maintained includes supplier profile data, financials, quality and delivery performance, spend analysis at various levels of the enterprise, from major business units to material part number

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Maintain Source Data Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Maintain Source Data
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Supplier and Material Rationalization	Web based access to supplier/source data
Automated Update of Supplier Performance Information	None identified
On Demand Access of Supplier/ Source Data	Web based access to current supplier/source data
Data Accessibility across the Enterprise for Visibility by Discrete Business Units	Web based access to various levels of enterprise data
	Access to supplier environmental management and compliance data



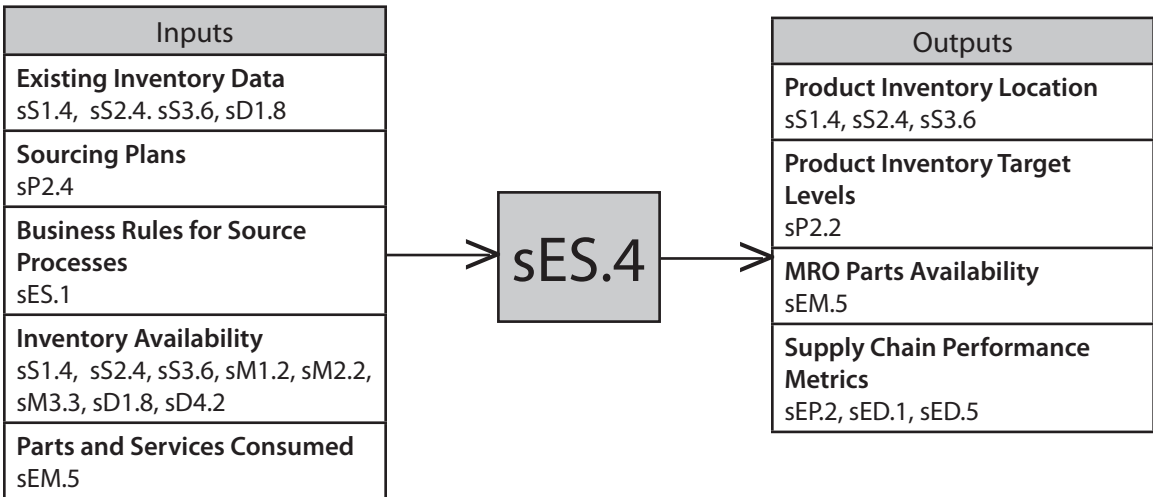
Manage Product Inventory

The process of establishing and maintaining physical inventories and inventory information. This includes warehouse management, cycle counting, physical inventories and inventory reconciliation. For Services, this may include tracking the number of service providers and the financial resources committed at any given point in time.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Product Inventory Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Product Inventory, Number of worker absences due to poor IAQ, Warehousing solid waste, Packaging material re-use, % of warehouse loading machinery using MFBs, Warehouse energy costs, Water use reduction, Hazardous waste generated at warehousing facilities as % of total waste generated
Supply Chain Asset Management	Inventory Days of Supply
Best Practices	Description/Definition
Statistical Test Count	The Statistical Test Count (STC) process is a method of validating inventory on-hand values by physically counting and reconciling a statistical sample of the entire inventory population. This sample is then extrapolated across the inventory population, which provides an indicative measure of entire inventory population. Furthermore, with extrapolation the net and gross percentage of error is determined.
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Storm water management plans	Implement storm water management and spill response plans
Energy-efficient HVAC systems	Utilize energy-efficient HVAC systems
Real Time Data on Current Status	Dynamic calculation of safety stock based on actual sales.
Utilize maintenance free batteries	Utilize maintenance free batteries in warehouse/short haul vehicles

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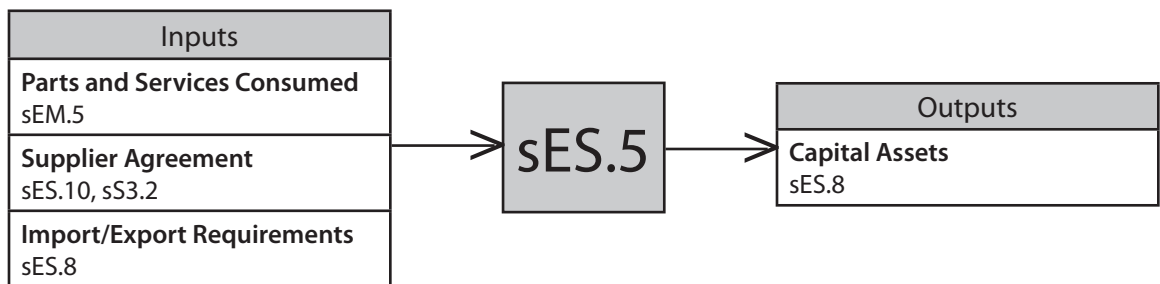
Best Practices cont.	Description/Definition cont.
Energy-efficient buildings	Utilize energy-efficient lighting and heating systems throughout warehouse and production areas
Periodic Review of Metrics and Strategy with Comparisons to Industry Benchmarks	Real time view of data.
Reusable pallets	Utilize reusable pallets



Manage Capital Assets

The process of acquiring, maintaining and dispositioning an organization’s <capital assets> located at a supplier’s facility and/or outside source, which are used to operate the supply chain.

Performance Attributes	Metric
Supply Chain Reliability	% of assets in compliance with scheduled maintenance requirements
Supply Chain Responsiveness	Manage Capital Assets Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Source Capital Assets
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Changeover Reduction / Continuous Improvement Program	Changeover process flow element identification, instructional directions to conduct changeover, and measurement tool, which can be used to prioritize and track results of improvement efforts. Software to identify operational constraints to the MAKE processes to assist in directing resources toward bottleneck functional areas.
Total Preventative Maintenance Program	Automatically generated TPM repair schedules integrated with MRP systems, electronic equipment repair history, parts listings, part stores inventory & reorder points, automatic store room parts purchases, Shop floor access to electronic data base of equipment line drawings, electrical wiring diagrams, parts listing reference guide and part cost lists.
Removal of Obsolete Capital Assets	Automated Calculation of ABC Velocity Movement
Facility & Equipment Environmental / Safety Audit System	System software to list checklist items, report results of audit & forward actions to be taken

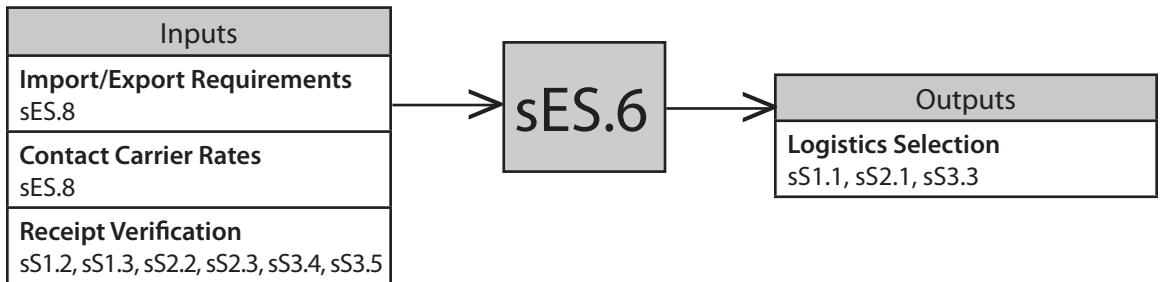


Manage Incoming Product

The process of defining and maintaining the information that characterizes inbound logistics management of all supplier deliveries, including both physical and electronic goods and services. This includes carrier selection and management, tracking deliveries and import.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Incoming Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Incoming Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Real-Time Optimized Shipment Method Selection (Air Parcel, Ground Parcel, LTL, etc.) Based on Customer Service Requirements	Transportation Management System (TMS) Maintenance Management
Automated Documentation for International Shipments	Transportation Management System (TMS) Maintenance Management
Backhaul Trading Exchange	Pooling
Capture and Maintain Mode Specific Data	Transportation Management System (TMS) Maintenance Management
Integrated Order Management, Warehouse Management, and Transportation Management Systems View for analysis for all orders and shipments the following data: Logistics, Product, Cost, GL Charging	Transportation Management System (TMS) Maintenance Management
Real-Time Shipment Tracking, (via internet)	Transportation Management System (TMS) Maintenance Management
Measurement of Carrier Performance for On-time Delivery and Completeness	Transportation Management System (TMS) Maintenance Management
Electronic Manifest and Electronic Billing	Transportation Management System (TMS) Maintenance Management
Appointment Scheduling for Pickup and Delivery of Customer Shipments	Transportation Management System (TMS) Maintenance Management

Best Practices cont.	Description/Definition cont.
Manage Information Across 100% of Shipments	Transportation Management System (TMS) Maintenance Management
Rating & Routing	Internet Pooling (Electronic brokerage of shipments)



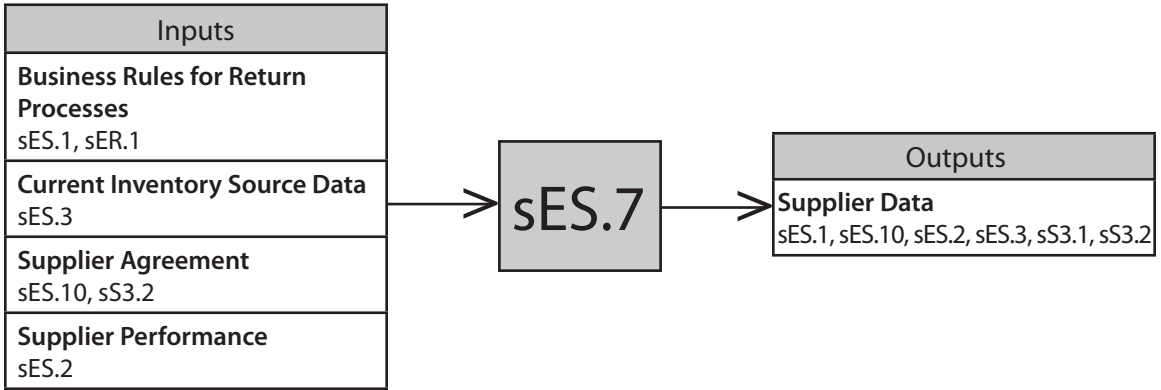
Manage Supplier Network

The process of defining and maintaining a unique network of suppliers to deliver a specific product set. This includes establishment of a new supplier or maintaining an existing supplier and all the tasks and activities associated with identifying and qualifying the supplier and finalizing on the sourcing terms and conditions. Also, the management of a supplier certification process, which includes certifying new suppliers and maintaining the current status of existing suppliers.

Performance Attributes	Metric
Supply Chain Reliability	% of suppliers meeting environmental metrics/criteria
Supply Chain Responsiveness	Manage Supplier Network Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Supplier Network
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Establishment of Criteria to Rank Suppliers	Utilize supplier delivery, quality, price performance as well as any other criteria such as terms and conditions
Evaluate Supplier Network for Duplicates	Supplier Merge Programs for duplicates
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Supplier Certification Programs Can Reduce the Cycle Time for Initial Certification of New Suppliers or Certifying Existing Suppliers that Wish to Provide New Technologies	
Electronic Data Interchange Can Be Used To Send Rfqs and Technical Information to and from Potential Suppliers to Determine Supplier Capability to Fulfill Requirements So that They May Be Added to Supplier Network	Electronic Data Interchange
Establish environmental requirements	Establish supplier environmental requirements
On-Line Availability to Supplier Financials to Determine Potential Supplier Viability to be Added to Supplier Network	Internet web sites for financial evaluation

Best Practices cont.	Description/Definition cont.
Identification of Suppliers Who Will Participate in Vendor Managed Inventory (VMI) Programs	Supplier managed inventories with scheduling interfaces to external supplier systems to replenish
Identification of Suppliers Who Will Participate in Kanban Programs	Electronic Kanban Support
Internet Exchanges	Internet Exchanges are a hosted, business-to-business trading network. Exchanges are an open procurement network, accessible to any buyer and focused on new Internet-enabled purchasing models like spot buys or reverse, buyer-driven auctions. Exchanges will also support more traditional catalog-based sales.
Supplier Certification Programs Can Reduce the Cycle Time for Certifying Existing Suppliers to Provide New Technologies	None identified
Create and Maintain Multiple Suppliers and Multiple Supplier Sites to Record Information about Individuals and Companies from Whom You Want to Purchase Catalogue Goods and Services	None Identified
On Line Document Management and Automated Supplier Approval Processes Can Reduce the Cycle Time and Costs Associated With Managing Supplier Evaluations and Get Them into the Supplier Network Faster	ERP
Carrier Agreement	Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions.
Identification of Suppliers Who Will Participate in Procurement Split (Two or More Suppliers Sharing Purchase Requirements) Programs	None identified
Utilize Concurrent Engineering with Suppliers to Allow Them to Provide Engineering and Product Performance Test Data to Qualify as Part of Potential Supplier Network	Internet, EDI, FAX

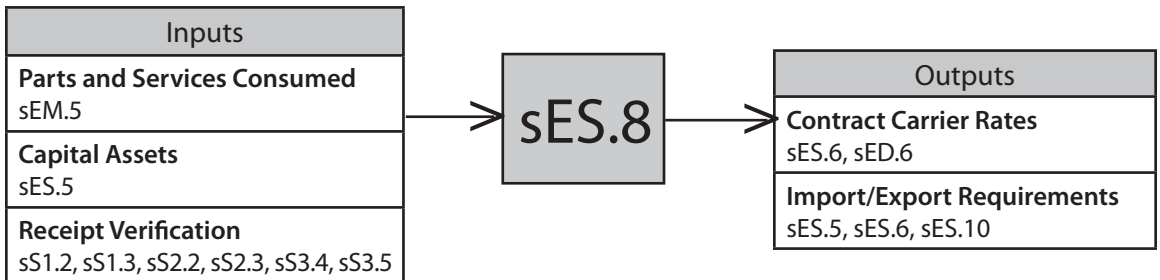
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Manage Import/ Export Requirements (Source)

The process of identifying and complying with import/export regulatory documentation and process standards set by external entities (eg, government).

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Customs Clearance Cycle Time, Manage Import/Export Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Import/Export Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Direct Transfer of Documents to Recipient and Forwarder	Electronic documentation submission via EDI and/or internet.
Ability to Track Component/Sub-Component Manufacturing Country of Origin	Component/lot tracking (lot trace-ability)
Direct Connection to Customs Clearance	Electronic documentation submission via EDI and/or internet.
Track foreign environmental requirements	Maintain and manage current foreign environmental regulations
Assessing Export/Import Requirements during Time of Product Development/Manufacture	Multi-country Export/Import documentation compliance



Manage Supply Chain Source Risk

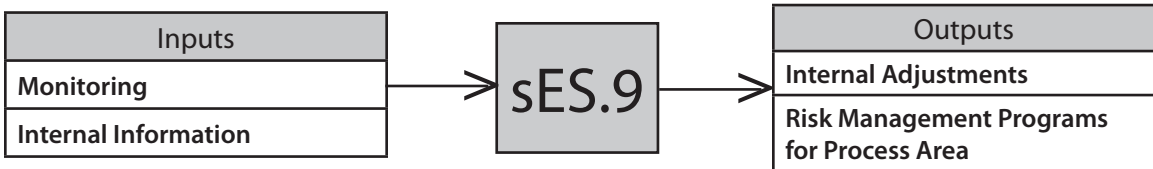
The process of managing Source risks within an overall Supply Chain Risk Program. This includes identifying and assessing Source risks as well as planning and implementing responses to Source risks. Source risks include potential events that could impact the organization's or the suppliers's ability to deliver raw material in a timely manner at a reasonable cost with acceptable quality. Risk Management includes: migration, either reducing the impact of a risk event or reducing the likelihood of its occurrence.

Performance Attributes	Metric
Supply Chain Reliability	VAR of product/customer performance - , Supplier Mitigation Plans Implemented (percent), VAR of Internal Process Performance, Value at Risk (Source), VAR of Supplier Performance, Age of Supplier Risk Data (months), Age of Product / Customer Risk Data (months)
Supply Chain Responsiveness	External Event Response (average days)
Supply Chain Agility	Internal Event Response (average days)
Supply Chain Costs	Mitigation Cost (\$), Assessment / Risk Management Costs (\$), Mitigation cost by Event (\$)
Supply Chain Asset Management	Individual Process Area Event Rating (EVAR) (\$), Supply / Customer / Product Base Rated (%), Residual Risk (\$), Gross Risk (\$), Event Risk (EVAR) (\$), Mitigated Risk (\$)
Best Practices	Description/Definition
Supply Chain Risk Identification	A key aspect of supply chain risk management is identification. Identification involves creating a list of potential events that could harm any aspect of the supply chain's performance. Risk identification allows an organization to take steps to create plans to manage risks before they occur. this is typically more cost effective then waiting to react to adverse events when they occur.
Crisis Communications Planning	Open communication is necessary for effective risk management, where the term "open" refers to the possibility to directly reach the right person – who can better handle the information about a crisis situations – wherever in the organization. Managers require direct communication channels up, down and across their business units to help identify risks and take appropriate actions.

Best Practices cont.	Description/Definition cont.
Supply Chain Risk Monitoring	Once areas of risk have been identified, an organization needs to monitor their internal and external environment. This helps them to predict when risky events are becoming more likely. It also helps to identify new risks and is tightly linked to the best practice of Supply Chain Risk Identification.
Supply Chain Business Rules Configured to mitigate risk	<p>This practice involves establishing business rules (e.g., customer priority, supplier priority, production routing, transportation routing, etc.) based on minimizing the risk to the supply chain. Under this practice, business rules are established or configured in response to the corporate risk management plan with a goal of reducing either the likelihood of a disruption occurring or the impact to the supply chain should a disruption occur.</p> <p>Business rule reconfiguration typically includes an assessment of the impact of each rule change on the overall supply chain before actual implementation.</p>
Supply Chain Information Configured to Minimize Risk	This practice involves managing supply chain information networks to minimize the risk to the supply chain. This includes information sharing with partners as well as internal locations. This helps all parties to be quickly informed of a real or potential disruption and respond quickly and appropriately to minimize the disruption impact.
Supply Chain Risk Assessment	Supply Chain Risk assessment provides management with an understanding of where the greatest risks may exist in order to prioritize resources for risk mitigation and management. Performing such assessments will involve clarifying the nature of the risk, understanding conditions that may lead to the event, knowing how frequently such events have happened or can be expected to happen, and the potential impact of such events. the team can then prioritize addressing the risks.
Sourcing Risk Mitigation Strategies	Strategies can be implemented to minimize sourcing risk.
Supply Chain Network Configured to Mitigate Risk	<p>This practice relies on a risk evaluation of the supply chain to guide the design of the supply chain network. Node locations, transportation routes, capacity size and location, number of suppliers, number of production locations, etc. are all determined in a fashion that mitigates potential disruptions to the ability to deliver product and service to the end customer.</p> <p>This practice relies on the information collected through risk identification and risk assessment processes to identify nodes that are at a high risk of disruption due to the location of the node. Location specific risks can include tactical strike risks, natural disaster risks, single point of failure risks, etc.</p>

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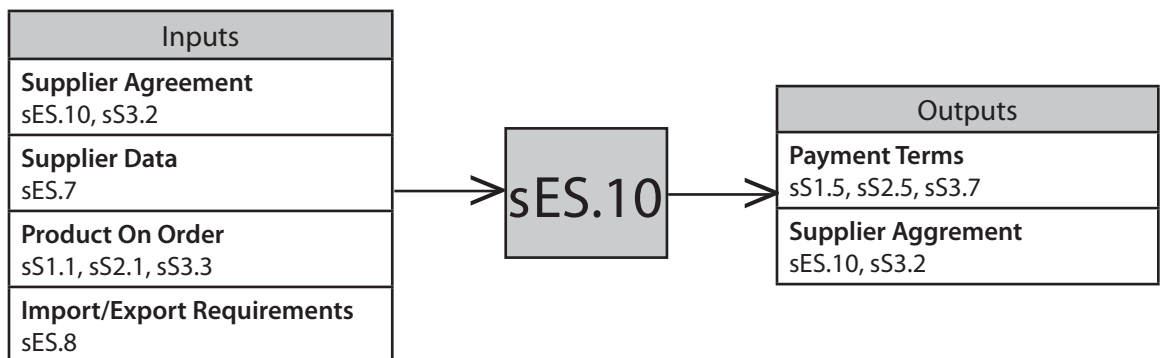
Best Practices cont.	Description/Definition cont.
<p>Sourcing Opportunities Prioritization to Improve Cost & Security of Supply</p>	<p>Many businesses need to improve performance through reliable Sourcing of more cost-effective supplies & services to meet customers' needs and growth opportunities. This Best Practice covers "strategic sourcing" approaches for reducing Total Cost of Ownership, and simultaneously assessing supply risk in case of business rationalization, excessive demand, fire, work outage, etc</p>
<p>Risk Management Programs Coordination with Partners</p>	<p>The process of coordinated risk management places a strong emphasis on cooperation among departments within a single company and among different companies of a supply chain to effectively manage the full range of risks as a whole. A closer coordination of risk management activities performed throughout the supply chain is intended to conserve resources and increase effectiveness.</p>
<p>Supply Chain Risk Management</p>	<p>Supply chain risk management is the systematic identification, assessment and mitigation of potential disruptions in logistics networks with the objective to reduce their negative impact on the logistics network's performance.</p>



Manage Supplier Agreements

The management of existing purchase orders or supplier contracts. This includes managing volume/step pricing, resolving issues, enforcing terms and conditions and maintaining an accurate status for existing purchase orders or contracts.

Performance Attributes	Metric
Supply Chain Reliability	% of suppliers meeting environmental metrics/criteria
Supply Chain Responsiveness	Manage Supplier Agreements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Supplier Agreements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Enterprise Level Spend Analysis	None identified
Enterprise Level Policies/Rules with Local Execution	Web based access to enterprise level business rules
Carrier Agreement	Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions.
Long Term Supplier Agreements/ Partnerships	Electronic rules for business relationships and transactions: Vendor-managed Inventory Agreements, Fab & Hold Agreements, Just-In-Time Agreements.
Optimized Supply-Chain Processes, Optimized Supplier Count, Supplier and Part Rationalization	Web based access to preferred and recommended suppliers, supplier performance data & spend data stratified by commodity, business unit/site, supplier, part type, process type



Make

The process of adding value to products through mixing, separating, forming, machining, and chemical processes.

Process Categories

sM1: Make-to-Stock	The process of manufacturing in a make-to-stock environment adds value to products through mixing, separating, forming, machining, and chemical processes. Make to stock products are intended to be shipped from finished goods or 'off the shelf'; can be completed prior to receipt of a customer order, and are generally produced to a planned schedule in accordance with a sales forecast. No customer reference or customer order detail or specification is attached to production orders, attached to or marked on the product, or recorded in the shop floor management or ERP system for Make-to-Stock products.
sM2: Make-to-Order	Given plans for the production of specific parts, products, or formulations in specific quantities and planned availability of required sourced products, the scheduling of the operations to be preformed in accordance with these plans. Scheduling includes sequencing, and, depending on the factory layout, any standards for setup and run. In general intermediate production activities are coordinated prior to the scheduling of the operations to be preformed in producing a finished product.
sM3: Engineer-to-Order	The process of developing, designing, validating, and ultimately using a manufacturing process to produce products or services based on the requirements of a specific customer. In general Engineer-to-Order requires that work instructions may need to be defined or refined and material routing instructions may need to be added or modified. An example of an alternative or related name for Make Engineer-to-Order is: Design-to-Order (DTO).
sEM: Enable Make	The collection of processes associated with managing and monitoring Make process data, performance and relationships.

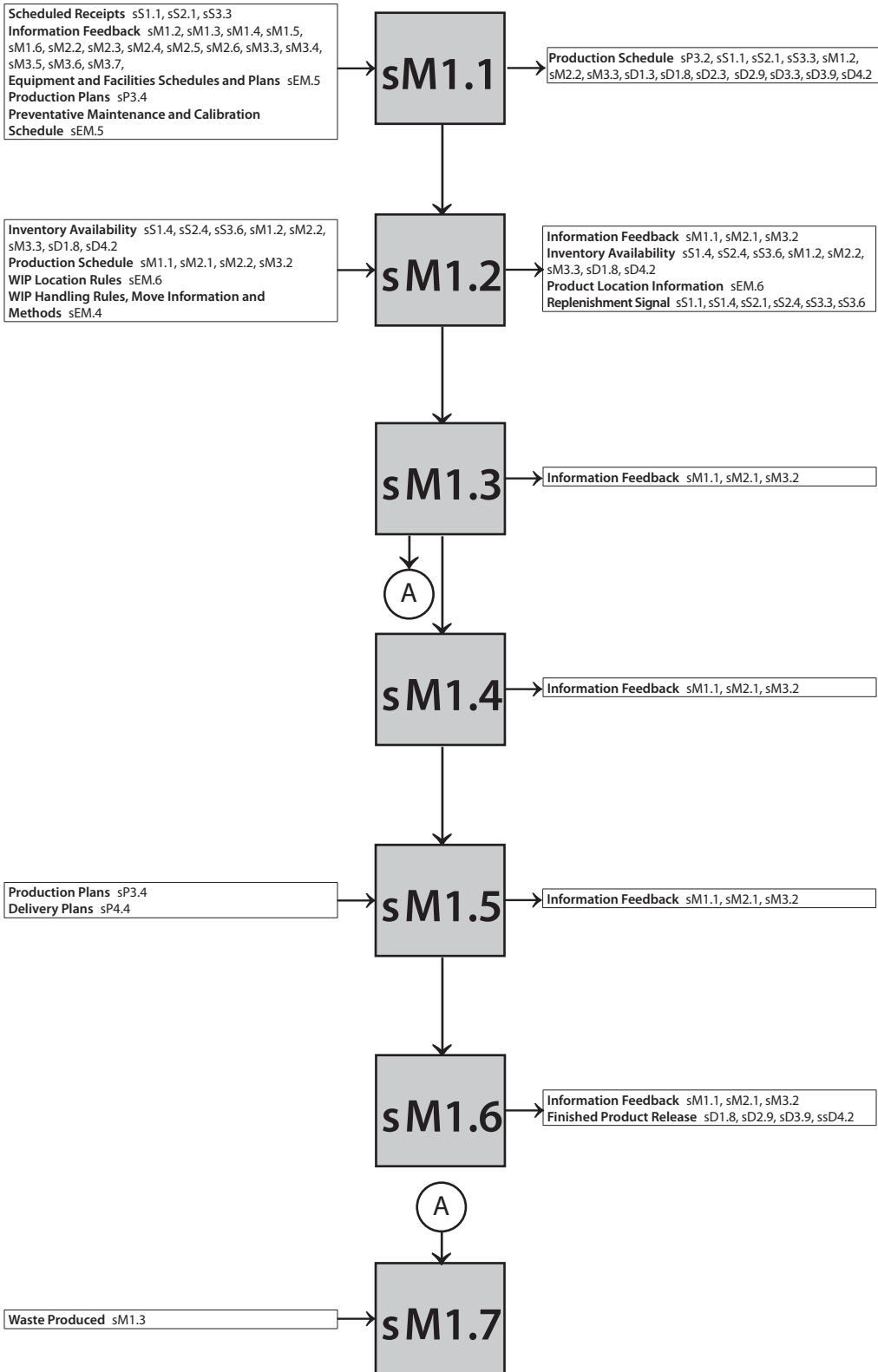
Make-to-Stock

The process of manufacturing in a make-to-stock environment adds value to products through mixing, separating, forming, machining, and chemical processes. Make to stock products are intended to be shipped from finished goods or 'off the shelf', can be completed prior to receipt of a customer order, and are generally produced to a planned schedule in accordance with a sales forecast. No customer reference or customer order detail or specification is attached to production orders, attached to or marked on the product, or recorded in the shop floor management or ERP system for Make-to-Stock products.

Performance Attributes	Metric
Supply Chain Reliability	Yield
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Make Cycle Time
Supply Chain Agility	Upside Make Adaptability, Downside Make Adaptability, Upside Make Flexibility
Supply Chain Costs	Cost to Make, Cost of Goods Sold
Supply Chain Asset Management	Cash-To-Cash Cycle Time, Return on Working Capital, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Link Individual Performance to Organizational and Divisional Goals	None identified
Performance Results that Are Compared to Benchmarks (i.e. Capacity, Scheduling) and Readily Available to Employees	Data warehouse, report writing, real time database and Executive Information systems that are easily accessible. Use of web-based technologies for dissemination of information.
Provide Continuous Formal Training to Employees	Examples would be TQM, Six Sigma.
Production Level Loading	Capacity planning

Best Practices cont.	Description/Definition cont.
Organize to Enhance Flexibility	Few Job Classifications, Self-Directed Work Force, Flat Management Structure, Cross-Functional Work Teams. Support for modular skills inventory with links to training databases, compensations systems, and operator instructions
Cellular Manufacturing	Manufacturing is broken into work cells
Accurate and Approved Work Instructions/Process Plans	Electronic document management that maintains current Standard Operating Procedures (SOP)
Lean Manufacturing	Use a team based systematic approach to identifying and eliminating wasteful, or non-value adding activities within your manufacturing organization
Paperless Order Tracking and Customer Visibility of Orders	Electronic dispatch and data collection with external interface to internet.
Demand-Pull Manufacturing, Including Active Reduction of Manufacturing Systems Time and WIP Through the Use of Demand-Pull Mechanisms and Visual Controls	Support of demand-pull mechanisms (Kanban, replenishment signals, etc.) based on rate schedules and user-defined minimum/maximum trigger points
Posted Performance Results	Data warehouse, report writing, real time data base and EI systems
Paperless Production Order and Inventory Tracking	Electronic dispatch and data collection. Allow customer access to production status and inventories using internet technologies and web site features.
Postponement	Postponement (delayed differentiation) is a supply chain concept where a product is kept as long as possible in a generic state. Differentiation of the generic product into a specific end-product is shifted closer to the consumer by postponing identify changes, such as assembly or packaging, to the last possible supply chain location.
Accurate and Low Cost Batch/ Configuration Records for Warranty and Regulatory Tracking	Electronic batch recording/configuration

sM1



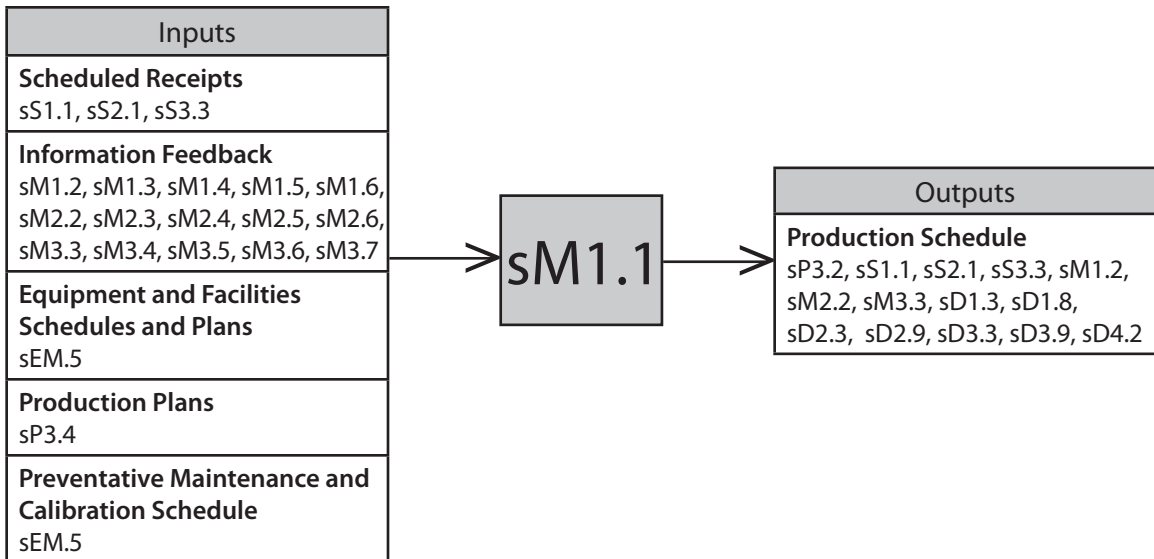
Schedule Production Activities

Given plans for the production of specific parts, products, or formulations in specified quantities and planned availability of required sourced products, the scheduling of the operations to be performed in accordance with these plans. Scheduling includes sequencing, and, depending on the factory layout, any standards for setup and run. In general, intermediate production activities are coordinated prior to the scheduling of the operations to be performed in producing a finished product.

Performance Attributes	Metric
Supply Chain Reliability	Schedule Achievement
Supply Chain Responsiveness	Schedule Production Activities Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Peak Time Energy Use, Cost to Schedule Production Activities
Supply Chain Asset Management	Capacity Utilization
Best Practices	Description/Definition
Cross Training/Certification	HR/certification support
Additional Capacity for Overflow Demand	Outsource manufacturing and work force augmentation providers connected to production schedules via the internet.
Real Time Feedback from Production, Raw Materials, and Finished Goods Inventory and Test Activities	Allow dynamic re-synchronization of MAKE activities by tying in real time status information to scheduler.
Utilize off-peak shifts	Utilize off-peak shifts for production workers (e.g., shift 1 = 11:00–19:00)
Schedule air emissions after sunset	Schedule air emission emitting activities after sunset
Maintain Data and System Integrity by Ensuring Production Data, Inventory Levels, and Schedule Requirements Are 99+% Accurate	Detailed production model that synchronizes PLAN and MAKE activities in real time.
Schedule Minimizes Changeover Costs between Products	Algorithms that manage set up times/costs, cleaning times, and ideal job sequences (e.g., color sequencing light to dark)
Schedule Includes Preventative Maintenance Program	Interface between maintenance management system and scheduling system
Drum-Buffer-Rope Scheduling Technique	(DBR, also referred to as Synchronous Manufacturing or Constraint Management) A technique used to manage resources to maximize throughput.
Schedule high energy consumption at night	Schedule electricity consuming (large amounts) activities from sunset to sunrise

sM1.1

Best Practices cont.	Description/Definition cont.
Schedule Reflects Current Plant Status (Equipment Availability, Other Jobs and Resource Availability) On Line	Schedule undated by on line reporting and status systems and re-sequence activities
Produce Products to Unique Customer Requirements	Order entry specifications linked to manufacturing order
Provide Scheduling Output Back to Material and Labor Planning Systems	Allow dynamic re-synchronization of MAKE activities by tying in real time status information to scheduler
Demand-Pull Manufacturing, Including Active Reduction of Manufacturing Systems Time and WIP Through the Use of Demand-Pull Mechanisms and Visual Controls	Support of demand-pull mechanisms (Kanban, replenishment signals, etc.) based on rate schedules and user-defined minimum/maximum trigger points
Schedule Optimizes Use of Shared Resources Such as Tooling and Production Equipment	Scheduling utilizing optimization techniques Required production resources included in routing/process instructions

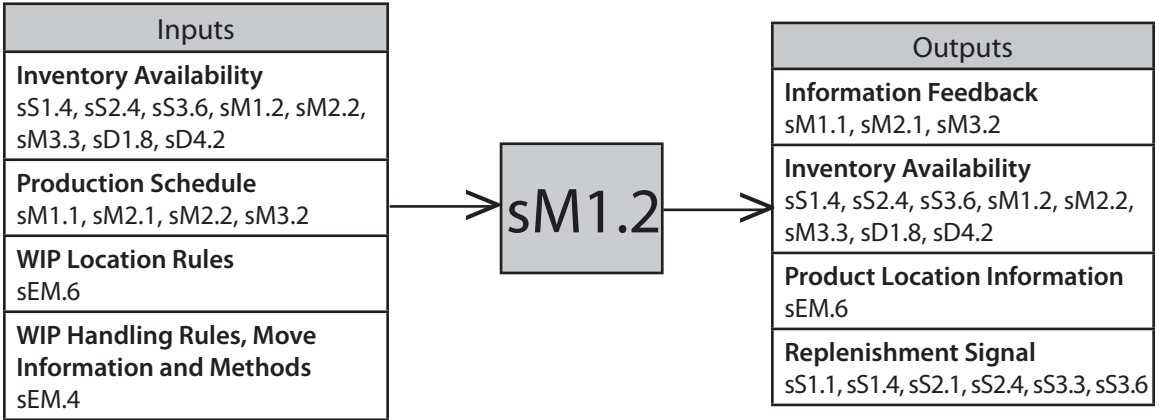


Issue Material

The selection and physical movement of sourced/in-process product (e.g., raw materials, fabricated components, subassemblies, required ingredients or intermediate formulations) from a stocking location (e.g., stockroom, a location on the production floor, a supplier) to a specific point of use location. Issuing product includes the corresponding system transaction. The Bill of Materials/routing information or recipe/production instructions will determine the products to be issued to support the production operation(s).

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Issue Material Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Quantity per shipment, Cost to Issue Material, % of vehicle fuel derived from alternative fuels
Supply Chain Asset Management	Packaging as % of total material
Best Practices	Description/Definition
Strategic Safety Stock of Selected Materials, Items, or Subassemblies to Decouple Sourced Product Issuance Cycle Time from Supplier Lead Time	Use of safety stock algorithms to minimize stock levels.
Utilize high efficiency vehicles	Utilize high fuel efficiency vehicles
Utilize off-peak shifts	Utilize off-peak shifts for production workers (e.g., shift 1 = 11:00–19:00)
Back Flush Material at Order Completion	Flexible back flush logic
Complete Lot History	Inventory by lot of sourced/in-process or discrete order /usage reporting by lot or discrete order
Demand-Pull Mechanisms; Kanban Replenishment Signals from Stockroom, Intermediate Products, or Subassembly Area	None identified
Supplier Delivery to Production Process at Point of Use	EDI link to supplier's sales order and inventory systems
Utilize alternative fuel vehicles	Utilize alternative fuel vehicles
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Electronic Material Move Transactions	Automated process control and/or barcode data collection

sM1.2



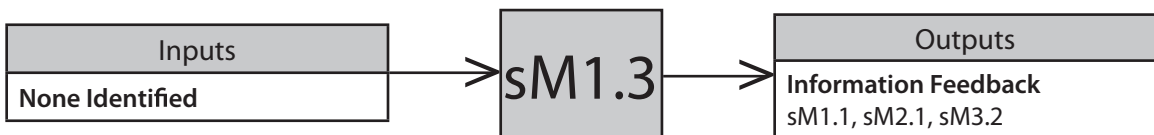
Produce and Test

The series of activities performed upon sourced/in-process product to convert it from the raw or semi-finished state to a state of completion and greater value. The processes associated with the validation of product performance to ensure conformance to defined specifications and requirements.

Performance Attributes	Metric
Supply Chain Reliability	Warranty Costs, Yield Variability, Warranty and Returns, Fill Rate, Yield
Supply Chain Responsiveness	Produce and Test Cycle Time, Asset Turns
Supply Chain Agility	None Identified
Supply Chain Costs	NPDES permitted water effluent, Hazardous waste generated at warehousing facilities as % of total waste generated, Air emissions, Energy consumption, Cost to Produce and Test, % of solid waste consisting of packaging material, Waste produced as % of product produced
Supply Chain Asset Management	% of products consisting of previously used components, Capacity Utilization, Hazardous materials used during production process as a % of all materials, % of production materials reused
Best Practices	Description/Definition
Maintain Accurate Lot/Batch History Information	Electronic data collection of employee actions and sourced/in-process product lot used
Implement an EMS	Implement an EMS
Real Time quality control techniques	Electronic collection of quality data and on-line SPC.
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Authorize Each Operation to Assess the Quality of the Previous Operations	None identified
Provide Continuous Formal Training to Employees	Examples would be TQM, Six Sigma.
Reduce Chances of Operator Error	Automatic download of production equipment with batch recipes/part programs

sM1.3

Best Practices cont.	Description/Definition cont.
Accurate and Approved Process Plans/ Specifications	Electronic document management
Paperless Production Control	Electronic dispatch of operations
Reduce Non-Value Added Paperwork While Still Measuring Process Metrics	Electronic data collection of completion, quality, lot tractability, scrap, and labor data
Reduce Non-Value Added Activities, Including Queue, Move, and Set-Up Times	Use principals of Lean Manufacturing.
Measuring Process Metrics and Feedback to Operators	Electronic data collection of completion, quality, scrap, labor and equipment data and dissemination of information on factory floor
Benchmark practices	Benchmark practices of other firms
Just-In-Time Demand Flow Techniques	Demand-pull mechanisms
Accurate and Low Cost Batch/ Configuration Records for Warranty and Regulatory Tracking	Electronic batch recording/configuration
Real Time Statistical Control Techniques	Electronic collection of defect data and on-line SPC.
Up-to-Date Shop Packet/Specifications	Electronic work instructions
Provide environmental training	Provide environmental training to all employees
Design/Upgrade Production Equipment to Maximize Flexibility and Avoid Line Stoppages	Machine productivity and downtime monitoring



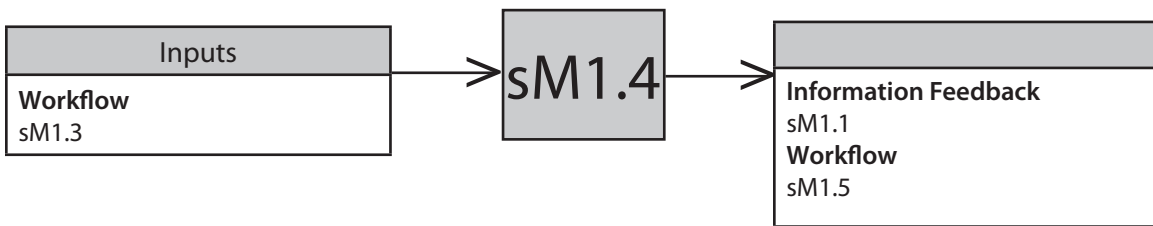
Package

The series of activities that containerize completed products for storage or sale to end-users. Within certain industries, packaging may include cleaning or sterilization.

Performance Attributes	Metric
Supply Chain Reliability	Warranty Costs, Warranty and Returns
Supply Chain Responsiveness	Asset Turns, Package Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	% packaging material that is recyclable/reusable, % packaging material consisting of post-consumer recycled content, % of excess packaging per unit, Packaging material re-use, Scrap packaging expense, % packaging material that is biodegradable, Cost to Package
Supply Chain Asset Management	Capacity Utilization
Best Practices	Description/Definition
Retrieve packaging after installation	Retrieve packaging after installation for reuse
Postponement and Pre-Kitting Of Accessories into Modular Packages that Allow Flexibility While Maintaining Control	None identified
Up-to-Date Shop Packet/ Specification for Each Unique Production Event/Demand	Electronic Work Instructions
Paperless Production Control	Electronic dispatch of operations
Accurate and Low Cost Batch/ Configuration Records for Warranty and Regulatory Tracking	Electronic batch recording/configuration
Minimize Operator Induced Errors	Automatic download of production equipment with setup parameters Graphical display of setup, changeover, or layout
Maximize Container Loading	Re-design container shapes to minimize material used but retain amount of product stored
Bulk Packaging	Package larger groups of items in a single package (bulk)
Accurate and Approved Process Plans, Routings, Specifications and Procedures	Electronic document management

sM1.4

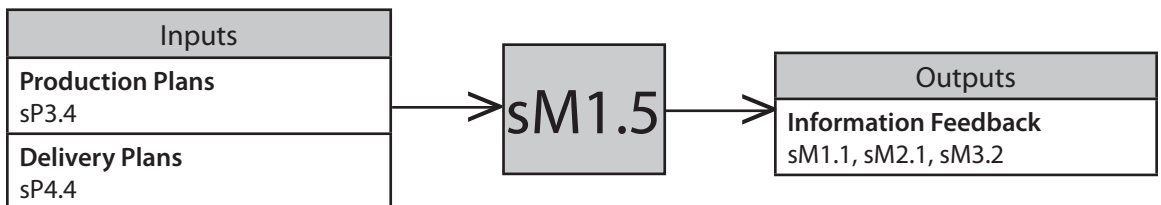
Best Practices cont.	Description/Definition cont.
Reduce Non-Value Added Paperwork While Still Measuring Process Metrics	Electronic data collection of completion, quality, lot tractability, scrap, and labor data
Design/Upgrade Production Equipment to Maximize Flexibility and Avoid Line Stoppages	Machine productivity and downtime monitoring
Packaging Operation is an Integral Part of the Overall Production Process	None identified
Automatic Label and Seal Verification	Automatic interface to inspection systems
Use multi-purpose packaging	Use multi-purpose packaging that can be used by customer
Use recyclable packaging	Use recyclable packaging



Stage Product

The movement of packaged products into a temporary holding location to await movement to a finished goods location. Products that are made to order may remain in the holding location to await shipment per the associated customer order. The movement to finished goods is part of the Deliver process.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Stage Finished Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Stage Finished Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Electronic Material Move Transactions	Automated process control and/or barcode data collection
Direct Ship from Factory to Customer/Channel	Share production status with customers and transportation providers via web-based tools. Auto-Tendering for direct ship utilizing EDI/XML protocols.

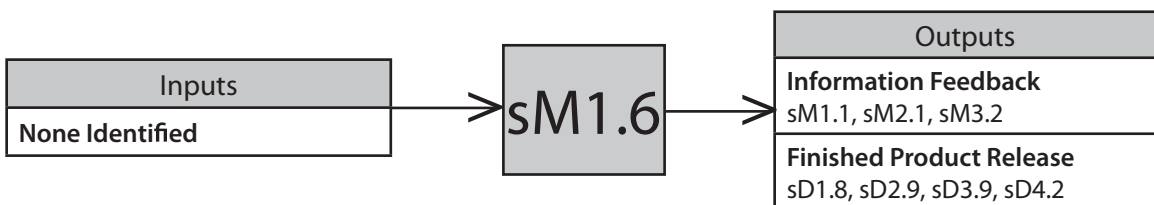


sM1.6

Release Product to Deliver

Activities associated with post-production documentation, testing, or certification required prior to delivery of finished product to customer. Examples include assembly of batch records for regulatory agencies, laboratory tests for potency or purity, creating certificate of analysis, and sign-off by the quality organization.

Performance Attributes	Metric
Supply Chain Reliability	# of complaints regarding missing environmental documentation, # of recordkeeping related NOV's
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Release Finished Product to Deliver
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Accurate and Low Cost Batch records for Regulatory Compliance	Electronic batch records
Ensure environmental documentation	Ensure all required environmental documentation is obtained
Review Batch Records by Exception	Electronic batch records linked to process plans/recipes and exceptions flagged
Implement HAZMAT "pharmacy" system	Implement hazardous materials "pharmacy" system
Include supplier environmental information	Include supplier environmental information in addition to product environmental information
Automated Notification of Laboratory Regarding Sample Availability	Interface between production system and LIMS
Implement an EMS	Implement an EMS



Waste Disposal

Activities associated with collecting and managing waste produced during the produce and test process including scrap material and non-conforming product.

Performance Attributes	Metric
Supply Chain Reliability	Reportable Release Incidents Waste Processing Error
Supply Chain Responsiveness	Waste accumulation time
Supply Chain Agility	Waste storage capacity utilization
Supply Chain Costs	Waste storage costs as % of total Make costs
Supply Chain Asset Management	Hazardous waste as % of total waste Recyclable waste as % of total waste
Best Practices	Description/Definition
Daily HAZMAT inspection	Daily inspection of any hazardous waste storage areas
Waste accumulation Environmental Management System (EMS)	EMS covering waste accumulation processes
Storm water prevention plans	Storm water prevention and spill control plans for waste accumulation areas



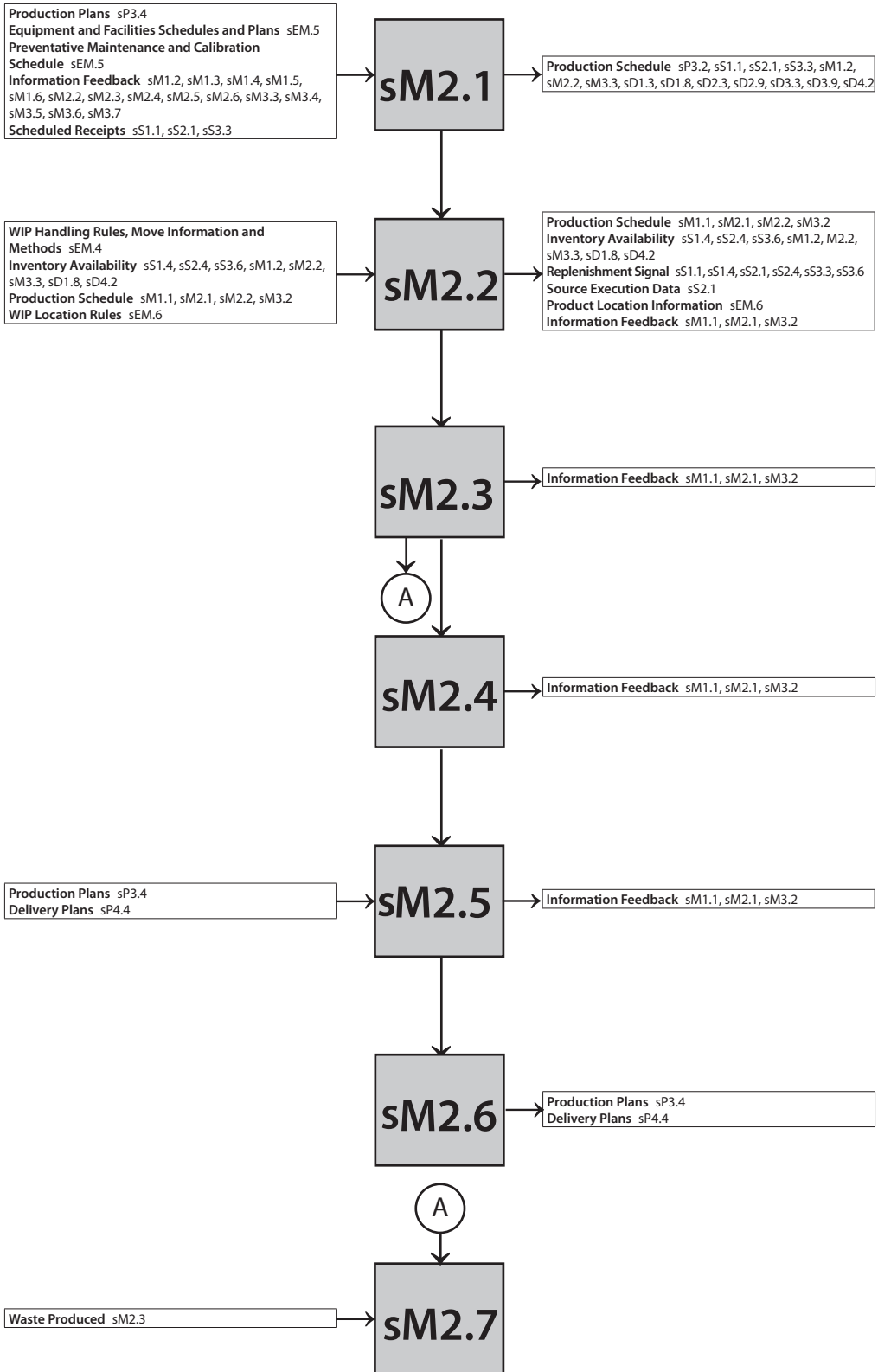
Make-to-Order

The process of manufacturing in a make-to-order environment adds value to products through mixing, separating, forming, machining, and chemical processes for a specific customer order. Products are completed, built or configured only in response to a customer order, the customer order reference is attached to the production order, attached to or marked on the product upon completion of the make process and referenced when transferring the product to Deliver. The product is identifiable throughout the Make process, as made for a specific customer order. Examples of alternative or related names for Make-to-Order are: Build-to-Order (BTO), Assemble-to-Order (ATO), Configure-to-Order (CTO), and postponement.

Performance Attributes	Metric
Supply Chain Reliability	Yield, Perfect Order Fulfillment
Supply Chain Responsiveness	Make Cycle Time
Supply Chain Agility	Downside Make Adaptability, Upside Make Adaptability, Upside Make Flexibility
Supply Chain Costs	Energy Costs, Cost of Goods Sold, Cost to Make
Supply Chain Asset Management	Inventory Days of Supply (WIP), Return on Working Capital, Cash-To-Cash Cycle Time, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
Accurate and Approved Work Instructions/Process Plans	Electronic document management that maintains current Standard Operating Procedures (SOP)
Produce Products to Unique Customer Requirements	Order entry specifications linked to manufacturing order
Accurate and Low Cost Batch/ Configuration Records for Warranty and Regulatory Tracking	Electronic batch recording/configuration
Postponement	Postponement (delayed differentiation) is a supply chain concept where a product is kept as long as possible in a generic state. Differentiation of the generic product into a specific end-product is shifted closer to the consumer by postponing identify changes, such as assembly or packaging, to the last possible supply chain location.
Provide Continuous Formal Training to Employees	Examples would be TQM, Six Sigma.

Best Practices cont.	Description/Definition cont.
Delivery Schedules Are Collaboratively Developed with Customers	Web-based access to plant scheduling status, collaborative data-sharing environment.
Paperless Order Tracking and Customer Visibility of Orders	Electronic dispatch and data collection with external interface to internet.
Posted Performance Results	Data warehouse, report writing, real time data base and EI systems
Organize to Enhance Flexibility: Few Job Classifications, Self-Directed Work Force, Flat Management Structure, Cross-Functional Work Teams	Support for modular skills inventory with links to training databases, compensations systems, and operator instructions
Link Individual Performance to Organizational and Divisional Goals	None identified
Production Level Loading	Capacity planning
Cellular and Demand Pull Manufacturing	Support for cellular and demand pull manufacturing execution

sM2

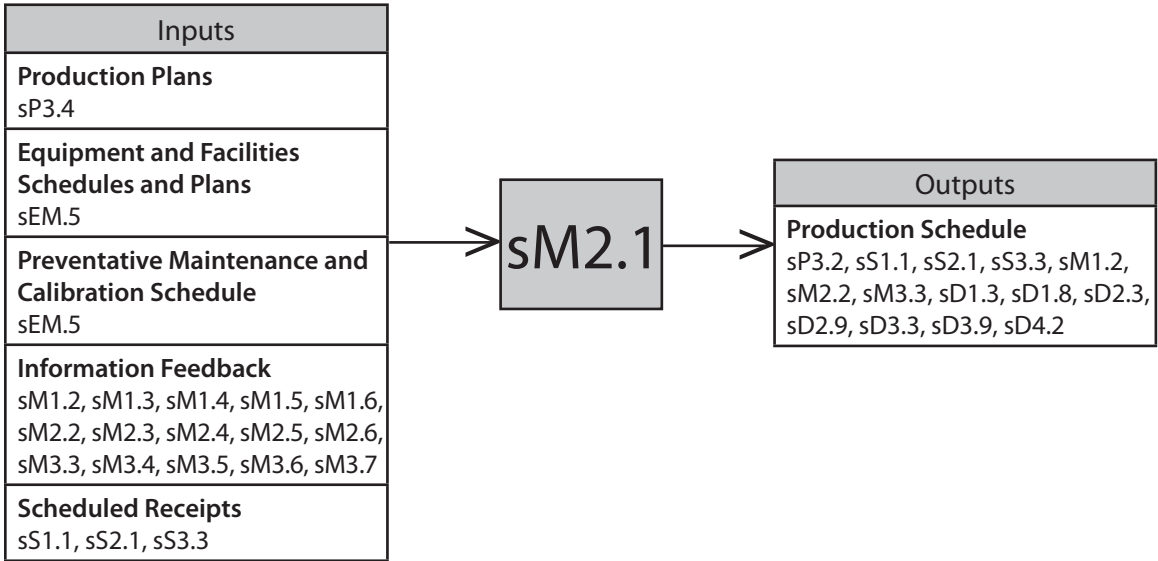


Schedule Production Activities

Given plans for the production of specific parts, products, or formulations in specific quantities and planned availability of required sourced products, the scheduling of the operations to be preformed in accordance with these plans. Scheduling includes sequencing, and, depending on the factory layout, any standards for setup and run. In general intermediate production activities are coordinated prior to the scheduling of the operations to be preformed in producing a finished product.

Performance Attributes	Metric
Supply Chain Reliability	Schedule Achievement
Supply Chain Responsiveness	Schedule Production Activities Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Schedule Production Activities, Peak Time Energy Use
Supply Chain Asset Management	Capacity Utilization
Best Practices	Description/Definition
Cross Training/Certification	HR/certification support
Schedule Optimizes Use of Shared Resources Such as Tooling and Production Equipment	Scheduling utilizing optimization techniques Required production resources included in routing/process instructions
Produce Products to Unique Customer Requirements	Order entry specifications linked to manufacturing order
Demand-Pull Manufacturing, Including Active Reduction of Manufacturing Systems Time and WIP Through the Use of Demand-Pull Mechanisms and Visual Controls	Support of demand-pull mechanisms (Kanban, replenishment signals, etc.) based on rate schedules and user-defined minimum/maximum trigger points
Drum-Buffer-Rope Scheduling Technique	(DBR, also referred to as Synchronous Manufacturing or Constraint Management) A technique used to manage resources to maximize throughput.
Maintain Data and System Integrity by Ensuring Production Data, Inventory Levels, and Schedule Requirements Are 99+% Accurate	Detailed production model that synchronizes PLAN and MAKE activities in real time.
Schedule high energy consumption at night	Schedule electricity consuming (large amounts) activities from sunset to sunrise
Schedule air emissions after sunset	Schedule air emission emitting activities after sunset
Demand Pull Mechanisms	Repetitive scheduling and sequencing

sM2.1

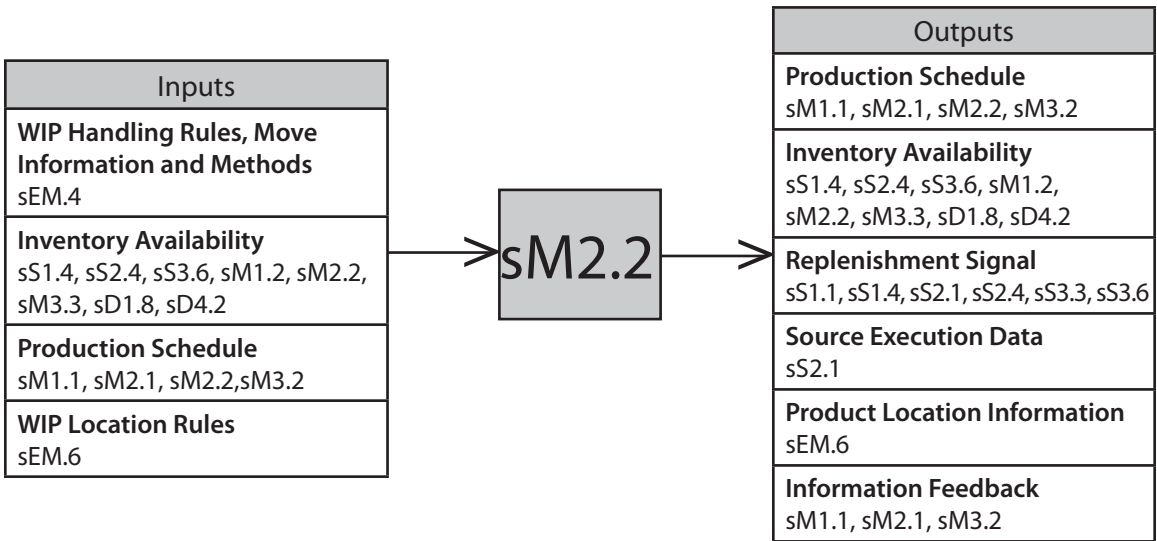


Issue Sourced/ In-Process Product

The selection and physical movement of sourced/in-process products (e.g., raw materials, fabricated components, subassemblies, required ingredients or intermediate formulations) from a stocking location (e.g., stockroom, a location on the production floor, a supplier) to a specific point of use location. Issuing product includes the corresponding system transaction. The Bill of Materials/routing information or recipe/production instructions will determine the products to be issued to support the production operation(s).

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Issue Sourced/In-Process Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	% of vehicle fuel derived from alternative fuels, Cost to Issue Sourced/In-Process Product, Quantity per shipment
Supply Chain Asset Management	Packaging as % of total material
Best Practices	Description/Definition
Complete Lot History	Inventory by lot of sourced/in-process or discrete order /usage reporting by lot or discrete order
Supplier Delivery to Production Process at Point of Use	EDI link to supplier's sales order and inventory systems
Utilize maintenance free batteries	Utilize maintenance free batteries in warehouse/short haul vehicles
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Utilize alternative fuel vehicles	Utilize alternative fuel vehicles
Electronic Material Move Transactions	Automated process control and/or barcode data collection
Demand-Pull Mechanisms; Kanban Replenishment Signals from Stockroom, Intermediate Products, or Subassembly Area	None identified
Utilize high efficiency vehicles	Utilize high fuel efficiency vehicles
Back Flush Material at Order Completion	Flexible back flush logic

sM2.2



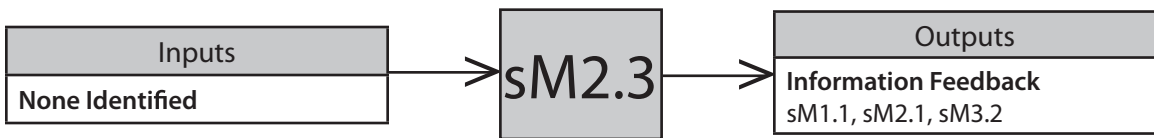
Produce and Test

The series of activities performed upon sourced/in-process product to convert it from the raw or semi-finished state to a state of completion and greater value. The processes associated with the validation of product performance to ensure conformance to defined specifications and requirements.

Performance Attributes	Metric
Supply Chain Reliability	Warranty Costs, Yield, Yield Variability
Supply Chain Responsiveness	Produce and Test Cycle Time, Asset Turns
Supply Chain Agility	None Identified
Supply Chain Costs	% of solid waste consisting of packaging material, NPDES permitted water effluent, Energy consumption, Air emissions, Cost to Produce and Test, Waste produced as % of product produced
Supply Chain Asset Management	% of production materials reused, Hazardous materials used during production process as a % of all materials, Capacity Utilization, % of products consisting of previously used components
Best Practices	Description/Definition
Reduce Chances of Operator Error	Automatic download of production equipment with batch recipes/part programs
Reduce Non-Value Added Activities, Including Queue, Move, and Set-Up Times	Use principals of Lean Manufacturing.
Design/Upgrade Production Equipment to Maximize Flexibility and Avoid Line Stoppages	Machine productivity and downtime monitoring
Accurate and Low Cost Batch/ Configuration Records for Warranty and Regulatory Tracking	Electronic batch recording/configuration
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Paperless Production Control	Electronic dispatch of operations
Benchmark practices	Benchmark practices of other firms

sM2.3

Best Practices cont.	Description/Definition cont.
Accurate and Approved Process Plans/Specifications	Electronic document management
Authorize Each Operation to Assess the Quality of the Previous Operations	None identified
Maintain Accurate Lot/Batch History Information	Electronic data collection of employee actions and sourced/in-process product lot used
Just-In-Time Demand Flow Techniques	Demand-pull mechanisms
Up-to-Date Shop Packet/ Specifications	Electronic work instructions
Provide environmental training	Provide environmental training to all employees
Implement an EMS	Implement an EMS
Real Time quality control techniques	Electronic collection of quality data and on-line SPC.
Real Time Statistical Control Techniques	Electronic collection of defect data and on-line SPC.



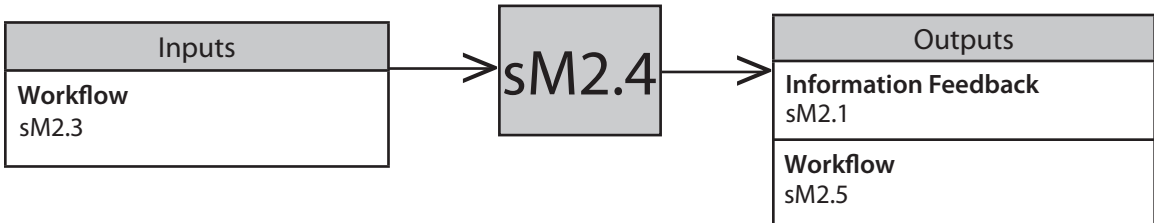
Package

The series of activities that containerize completed products for storage or sale to end-users. Within certain industries, packaging may include cleaning or sterilization.

Performance Attributes	Metric
Supply Chain Reliability	Warranty Costs
Supply Chain Responsiveness	Asset Turns, Package Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	% of excess packaging per unit, Cost to Package, % packaging material that is recyclable/reusable, % packaging material consisting of post-consumer recycled content, Scrap packaging expense, % packaging material that is biodegradable
Supply Chain Asset Management	% of packaging/shipping materials reused internally, Capacity Utilization
Best Practices	Description/Definition
Minimize Operator Induced Errors	Automatic download of production equipment with setup parameters Graphical display of setup, changeover, or layout
Retrieve packaging after installation	Retrieve packaging after installation for reuse
Accurate and Approved Process Plans/Specifications	Electronic document management
Postponement and Pre-Kitting Of Accessories into Modular Packages that Allow Flexibility While Maintaining Control	None identified
Up-to-Date Shop Packet/ Specification for Each Unique Production Event/Demand	Electronic Work Instructions
Automatic Label and Seal Verification	Automatic interface to inspection systems
Bulk Packaging	Package larger groups of items in a single package (bulk)
Reduce Non-Value Added Paperwork While Still Measuring Process Metrics	Electronic data collection of completion, quality, lot tractability, scrap, and labor data
Maximize Container Loading	Re-design container shapes to minimize material used but retain amount of product stored
Use multi-purpose packaging	Use multi-purpose packaging that can be used by customer

sM2.4

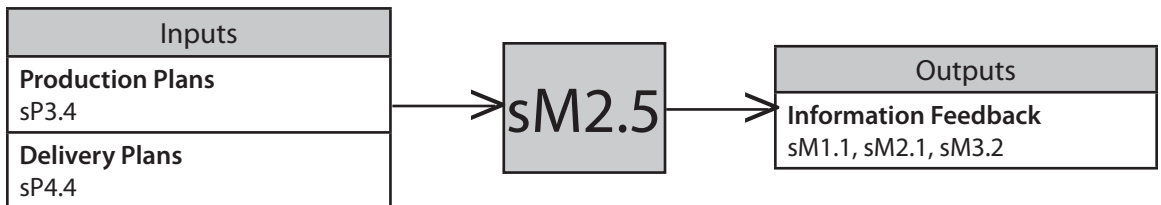
Best Practices cont.	Description/Definition cont.
Accurate and Low Cost Batch/ Configuration Records for Warranty and Regulatory Tracking	Electronic batch recording/configuration
Packaging Operation is an Integral Part of the Overall Production Process	None identified
Use recyclable packaging	Use recyclable packaging
Paperless Production Control	Electronic dispatch of operations



Stage Finished Product

The movement of packaged products into a temporary holding location to await movement to a finished goods location. Products that are made to order may remain in the holding location to await shipment per the associated customer order. The actual move transaction is part of the Deliver process.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Stage Finished Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Stage Finished Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Direct Ship from Factory to Customer/Channel	Share production status with customers and transportation providers via web-based tools. Auto-Tendering for direct ship utilizing EDI/XML protocols.
Electronic Material Move Transactions	Automated process control and/or barcode data collection

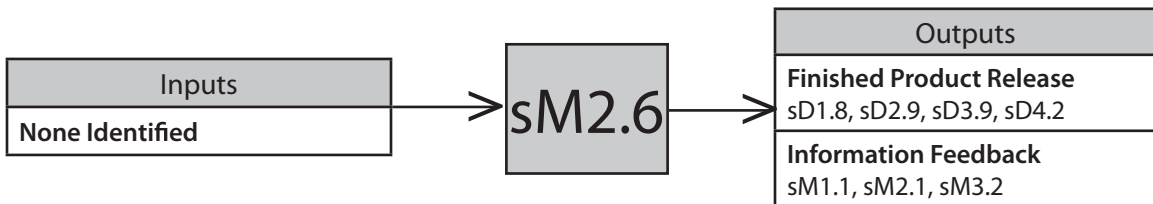


sM2.6

Release Finished Product to Deliver

Activities associated with post-production documentation, testing, or certification required prior to delivery of finished product to customer. Examples include assembly of batch records for regulatory agencies, laboratory tests for potency or purity, creating certificate of analysis, and sign-off by the quality organization.

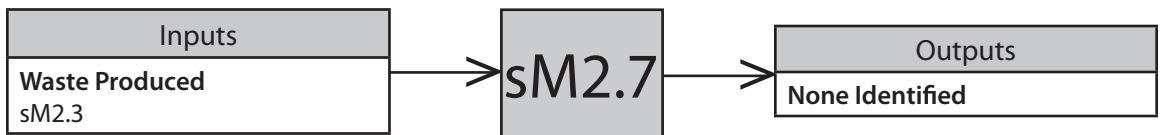
Performance Attributes	Metric
Supply Chain Reliability	% of products with proper environmental labeling (if required), % of products meeting specified environmental performance requirements
Supply Chain Responsiveness	Release Finished Product to Deliver Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Release Finished Product to Deliver
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Automated Notification of Laboratory Regarding Sample Availability	Interface between production system and LIMS
Implement an EMS	Implement an EMS
Accurate and Low Cost Batch records for Regulatory Compliance	Electronic batch records
Review Batch Records by Exception	Electronic batch records linked to process plans/recipes and exceptions flagged
Implement HAZMAT “pharmacy” system	Implement hazardous materials “pharmacy” system



Waste Disposal

Activities associated with collecting and managing waste produced during the produce and test process including scrap material and non-conforming product.

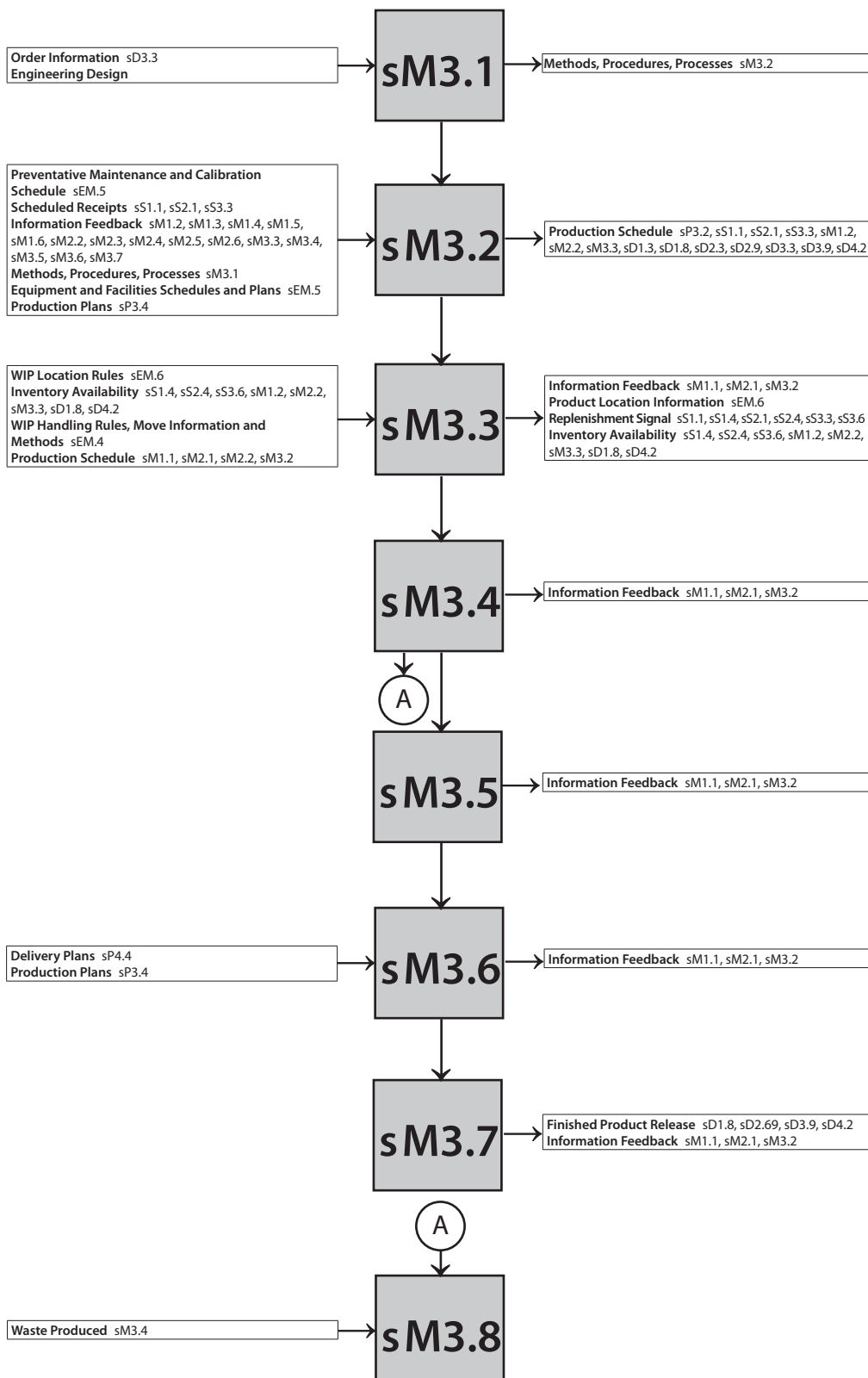
Performance Attributes	Metric
Reliability	Reportable Release Incidents Waste Processing Errors
Responsiveness	Waste accumulation time
Agility	Waste storage capacity utilization
Costs	Waste storage costs as % of Make costs
Asset	Hazardous waste as % of total waste Recyclable waste as % of total waste
Best Practices	Description/Definition
Daily HAZMAT inspection	Daily inspection of any hazardous waste storage areas
Waste accumulation Environmental Management System (EMS)	EMS covering waste accumulation processes
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing.
Inputs	
Waste Produced- From sM2.3	Waste produced during the produce and test process including scrap material and non-conforming product.



Engineer-to-Order

The process of developing, designing, validating, and ultimately using a manufacturing process to produce products or services based on the requirements of a specific customer. In general Engineer-to-Order requires that work instructions may need to be defined or refined and material routing instructions may need to be added or modified. An example of an alternative or related name for Make Engineer-to-Order is: Design-to-Order (DTO).

Performance Attributes	Metric
Supply Chain Reliability	Yield
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Make Cycle Time
Supply Chain Agility	Upside Make Adaptability, Downside Make Adaptability, Upside Make Flexibility
Supply Chain Costs	Cost to Make, Cost of Goods Sold
Supply Chain Asset Management	Cash-To-Cash Cycle Time, Return on Working Capital, Inventory Days of Supply (WIP), Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
Delivery Schedules Are Collaboratively Developed with Customers	Web-based access to plant scheduling status, collaborative data-sharing environment.
Product Design Collaboration with Customers	On-line design tools facilitated by internet connections.
Organize to Enhance Flexibility: Few Job Classifications, Self-Directed Work Force, Flat Management Structure, Cross-Functional Work Teams	Support for modular skills inventory with links to training databases, compensations systems, and operator instructions
Posted Performance Results	Data warehouse, report writing, real time data base and EI systems
Cellular Manufacturing	Manufacturing is broken into work cells
Demand-Pull Manufacturing, Including Active Reduction of Manufacturing Systems Time and WIP Through the Use of Demand-Pull Mechanisms and Visual Controls	Support of demand-pull mechanisms (Kanban, replenishment signals, etc.) based on rate schedules and user-defined minimum/maximum trigger points
Paperless Order Tracking and Customer Visibility of Orders	Electronic dispatch and data collection with external interface to internet.



sM3.1

Finalize Production Engineering

Engineering activities required after acceptance of order, but before product can be produced. May include generation and delivery of final drawings, specifications, formulas, part programs, etc. In general, the last step in the completion of any preliminary engineering work done as part of the quotation process.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Finalize Production Engineering Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Finalize Production Engineering
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Automated Conversion of Engineering Drawings into Product Specifications	None identified
Automated Configuration Management	Configuration



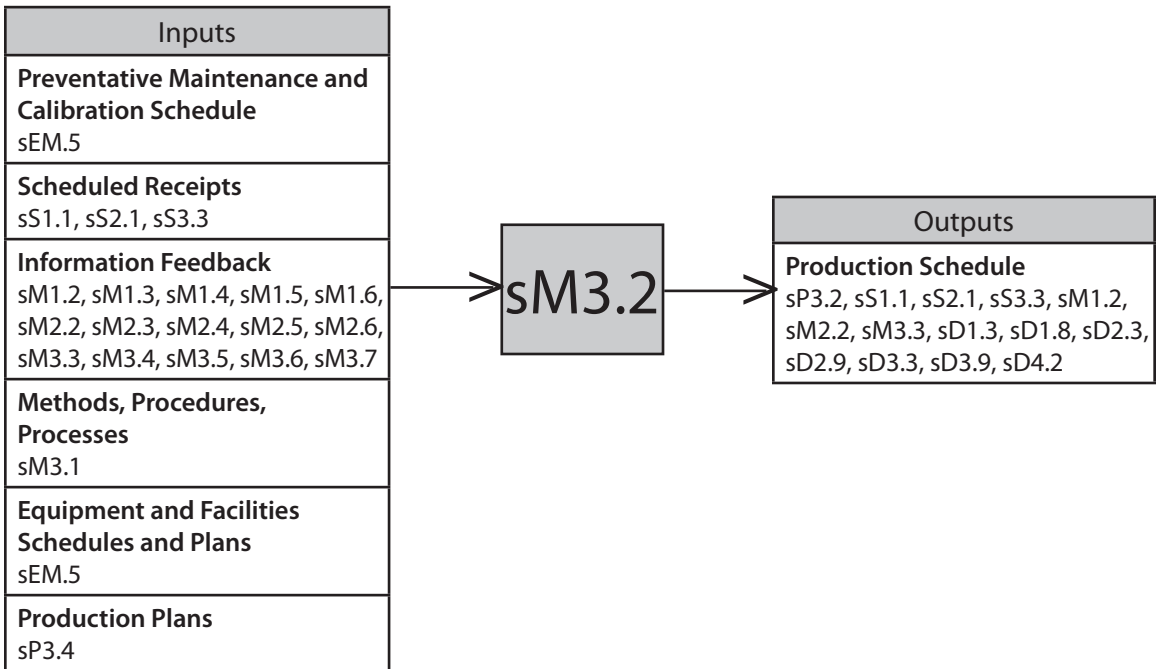
Schedule Production Activities

Given plans for the production of specific parts, products, or formulations in specified quantities and planned availability of required sourced products, the scheduling of the operations to be performed in accordance with these plans. Scheduling includes sequencing, and, depending on the factory layout, any standards for setup and run. In general, intermediate production activities are coordinated prior to the scheduling of the operations to be performed in producing a finished product.

Performance Attributes	Metric
Supply Chain Reliability	Schedule Achievement
Supply Chain Responsiveness	Schedule Production Activities Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Schedule Production Activities
Supply Chain Asset Management	Capacity Utilization
Best Practices	Description/Definition
Additional Capacity for Overflow Demand	Outsource manufacturing and work force augmentation providers connected to production schedules via the internet.
Utilize off-peak shifts	Utilize off-peak shifts for production workers (e.g., shift 1 = 11:00–19:00)
Schedule Minimizes Changeover Costs between Products	Algorithms that manage set up times/costs, cleaning times, and ideal job sequences (e.g., color sequencing light to dark)
Design/Upgrade Production Equipment to Maximize Flexibility and Avoid Line Stoppages	Machine productivity and downtime monitoring
Schedule high energy consumption at night	Schedule electricity consuming (large amounts) activities from sunset to sunrise
Schedule Optimizes Use of Shared Resources Such as Tooling and Production Equipment	Scheduling utilizing optimization techniques Required production resources included in routing/process instructions
Drum-Buffer-Rope Scheduling Technique	(DBR, also referred to as Synchronous Manufacturing or Constraint Management) A technique used to manage resources to maximize throughput.
Maximize Data Integrity and System Accuracy by Ensuring 99%+ Accuracy of BOM Configuration, Inventory Levels, and Schedule Requirements	None identified
Cellular Manufacturing	Manufacturing is broken into work cells
Best Practices cont.	Description/Definition cont.

sM3.2

Build Subassemblies to Forecast at Highest Generic Level in Bill of Material; Maintain Flexibility While Minimizing Cycle Time and Inventory Position	None identified
Schedule Includes Preventative Maintenance Program	Interface between maintenance management system and scheduling system
Schedule air emissions after sunset	Schedule air emission emitting activities after sunset
Schedule Reflects Current Plant Status (Equipment Availability, Other Jobs and Resource Availability) On Line	Schedule undated by on line reporting and status systems and re-sequence activities
Demand Pull Mechanisms	Repetitive scheduling and sequencing
Cross Training/Certification	HR/certification support

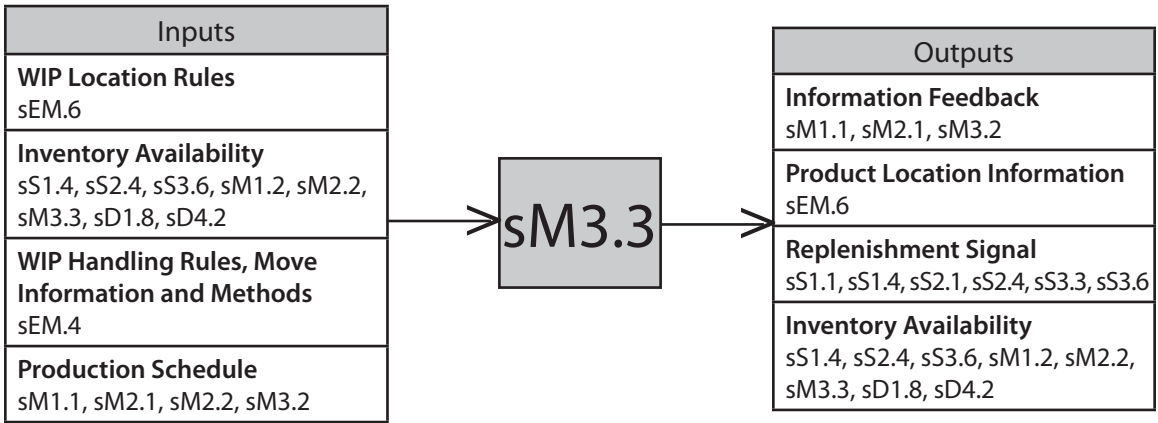


Issue Sourced/ In-Process Product

The selection and physical movement of sourced/in-process products (e.g., raw materials, fabricated components, subassemblies, required ingredients or intermediate formulations) from a stocking location (e.g., stockroom, a location on the production floor, a supplier) to a specific point of use location. Issuing material includes the corresponding system transaction. The Bill of Materials/routing information or recipe/production instructions will determine the materials to be issued to support the production operation(s).

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Issue Sourced/In-Process Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Issue Sourced/In-Process Product, % of vehicle fuel derived from alternative fuels, Quantity per shipment
Supply Chain Asset Management	Packaging as % of total material
Best Practices	Description/Definition
Utilize alternative fuel vehicles	Utilize alternative fuel vehicles
Demand-Pull Mechanisms; Kanban Replenishment Signals from Stockroom, Intermediate Products, or Subassembly Area	None identified
Electronic Material Move Transactions	Automated process control and/or barcode data collection
Back Flush Material at Order Completion	Flexible back flush logic
Utilize high efficiency vehicles	Utilize high fuel efficiency vehicles
Supplier Delivery to Production Process at Point of Use	EDI link to supplier's sales order and inventory systems
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Two-Bin Floor Stock Located at Work Center for "B" And "C" Components - Controlled by Operators and Replenished When One Bin is Empty	None identified

sM3.3



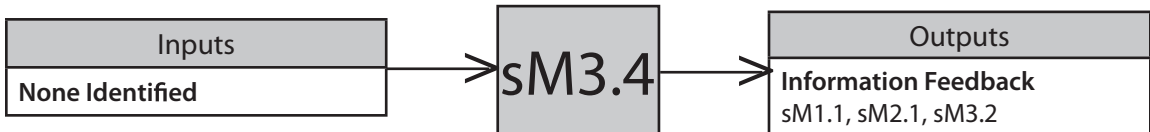
Produce and Test

The series of activities performed upon sourced/in-process product to convert it from the raw or semi-finished state to a state of completion and greater value. The processes associated with the validation of product performance to ensure conformance to defined specifications and requirements.

Performance Attributes	Metric
Supply Chain Reliability	Yield Variability, Yield, Warranty Costs
Supply Chain Responsiveness	Produce and Test Cycle Time, Asset Turns
Supply Chain Agility	None Identified
Supply Chain Costs	Hazardous waste generated at warehousing facilities as % of total waste generated, Air emissions, NPDES permitted water effluent, Cost to Produce and Test, Energy consumption, % of solid waste consisting of packaging material
Supply Chain Asset Management	Hazardous materials used during production process as a % of all materials, % of production materials reused, % of products consisting of previously used components
Best Practices	Description/Definition
Implement Employee Involvement Programs	None Identified
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Design/Upgrade Production Equipment to Maximize Flexibility and Avoid Line Stoppages	Machine productivity and downtime monitoring
Paperless Production Control	Electronic dispatch of operations
Provide Continuous Formal Training to Employees	Examples would be TQM, Six Sigma.
Provide environmental training	Provide environmental training to all employees
Link Individual Performance to Organizational and Divisional Goals	None identified

sM3.4

Real Time quality control techniques	Electronic collection of quality data and on-line SPC.
Best Practices cont.	Description/Definition cont.
Authorize Each Operation to Assess the Quality of the Previous Operations	None identified
Real Time Statistical Control Techniques	Electronic collection of defect data and on-line SPC.
Reduce Non-Value Added Activities, Including Queue, Move, and Set-Up Times	Use principals of Lean Manufacturing.
Just-In-Time Demand Flow Techniques	Demand-pull mechanisms
Benchmark practices	Benchmark practices of other firms
Implement an EMS	Implement an EMS
Maintain Accurate Lot/Batch History Information	Electronic data collection of employee actions and sourced/in-process product lot used
Up-to-Date Shop Packet/ Specifications	Electronic work instructions



Package

The series of activities that containerize completed products for storage or sale to end-users. Within certain industries, packaging may include cleaning or sterilization.

Performance Attributes	Metric
Supply Chain Reliability	Warranty Costs
Supply Chain Responsiveness	Package Cycle Time, Asset Turns
Supply Chain Agility	None Identified
Supply Chain Costs	Packaging material re-use, % packaging material that is recyclable/reusable, Scrap packaging expense, Cost to Package, % packaging material that is biodegradable, % packaging material consisting of post-consumer recycled content, % of excess packaging per unit
Supply Chain Asset Management	Capacity Utilization
Best Practices	Description/Definition
Postponement and Pre-Kitting Of Accessories into Modular Packages that Allow Flexibility While Maintaining Control	None identified
Use recyclable packaging	Use recyclable packaging
Bulk Packaging	Package larger groups of items in a single package (bulk)
Paperless Production Control	Electronic dispatch of operations
Retrieve packaging after installation	Retrieve packaging after installation for reuse
Design/Upgrade Production Equipment to Maximize Flexibility and Avoid Line Stoppages	Machine productivity and downtime monitoring
Maximize Container Loading	Re-design container shapes to minimize material used but retain amount of product stored
Packaging Operation is an Integral Part of the Overall Production Process	None identified
Automatic Label and Seal Verification	Automatic interface to inspection systems
Use multi-purpose packaging	Use multi-purpose packaging that can be used by customer

sM3.5

Up-to-Date Shop Packet/
Specifications

Electronic work instructions

Best Practices cont.

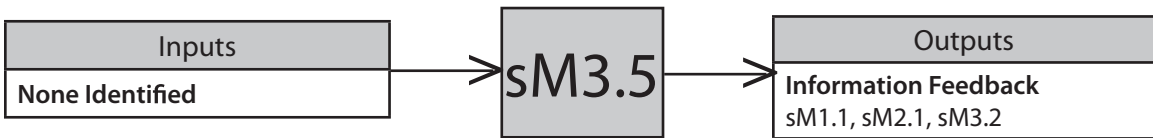
Description/Definition cont.

Electronic data collection of
completion, quality, lot trace ability,
scrap, and labor data

Reduce non-value added paperwork while still maintaining
process metrics

Minimize Operator Induced Errors

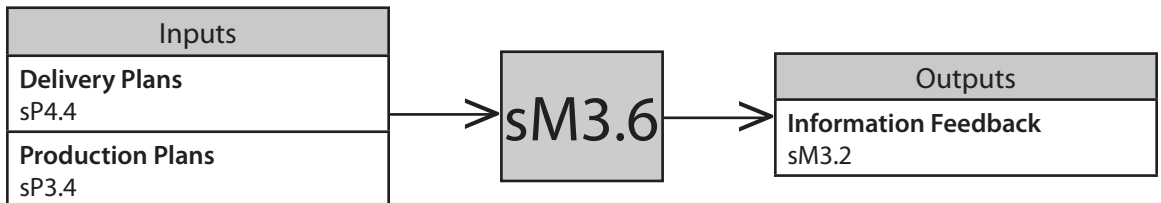
Automatic download of production equipment with setup
parameters Graphical display of setup, changeover, or layout



Stage Finished Product

The movement of packaged products into a temporary holding location to await movement to a finished goods location. Products that are made to order may remain in the holding location to await shipment per the associated customer order. The actual move transaction is part of the Deliver process.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Stage Finished Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Stage Finished Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Direct Ship from Factory to Customer/Channel	Share production status with customers and transportation providers via web-based tools. Auto-Tendering for direct ship utilizing EDI/XML protocols.
Electronic Material Move Transactions	Automated process control and/or barcode data collection

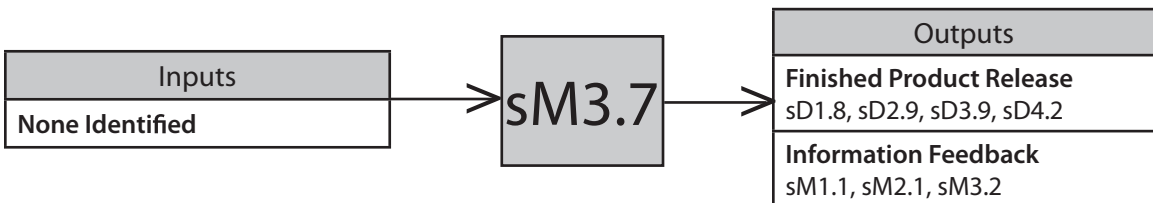


sM3.7

Release Product to Deliver

Activities associated with post-production documentation, testing, or certification required prior to delivery of finished product to customer. Examples include assembly of batch records for regulatory agencies, laboratory tests for potency or purity, creating certificate of analysis, and sign-off by the quality organization.

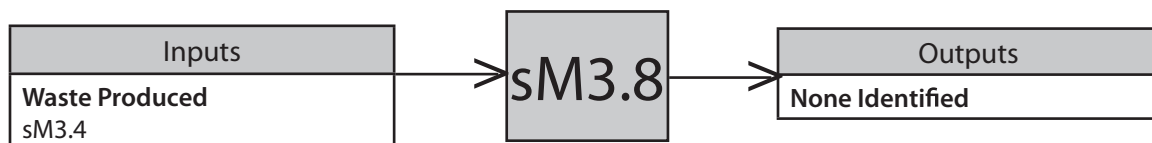
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Release Finished Product to Deliver Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Release Finished Product to Deliver
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Implement HAZMAT “pharmacy” system	Implement hazardous materials “pharmacy” system
Implement an EMS	Implement an EMS
Accurate and Low Cost Batch records for Regulatory Compliance	Electronic batch records
Automated Notification of Laboratory Regarding Sample Availability	Interface between production system and LIMS
Review Batch Records by Exception	Electronic batch records linked to process plans/recipes and exceptions flagged



Waste Disposal

Activities associated with collecting and managing waste produced during the produce and test process including scrap material and non-conforming product.

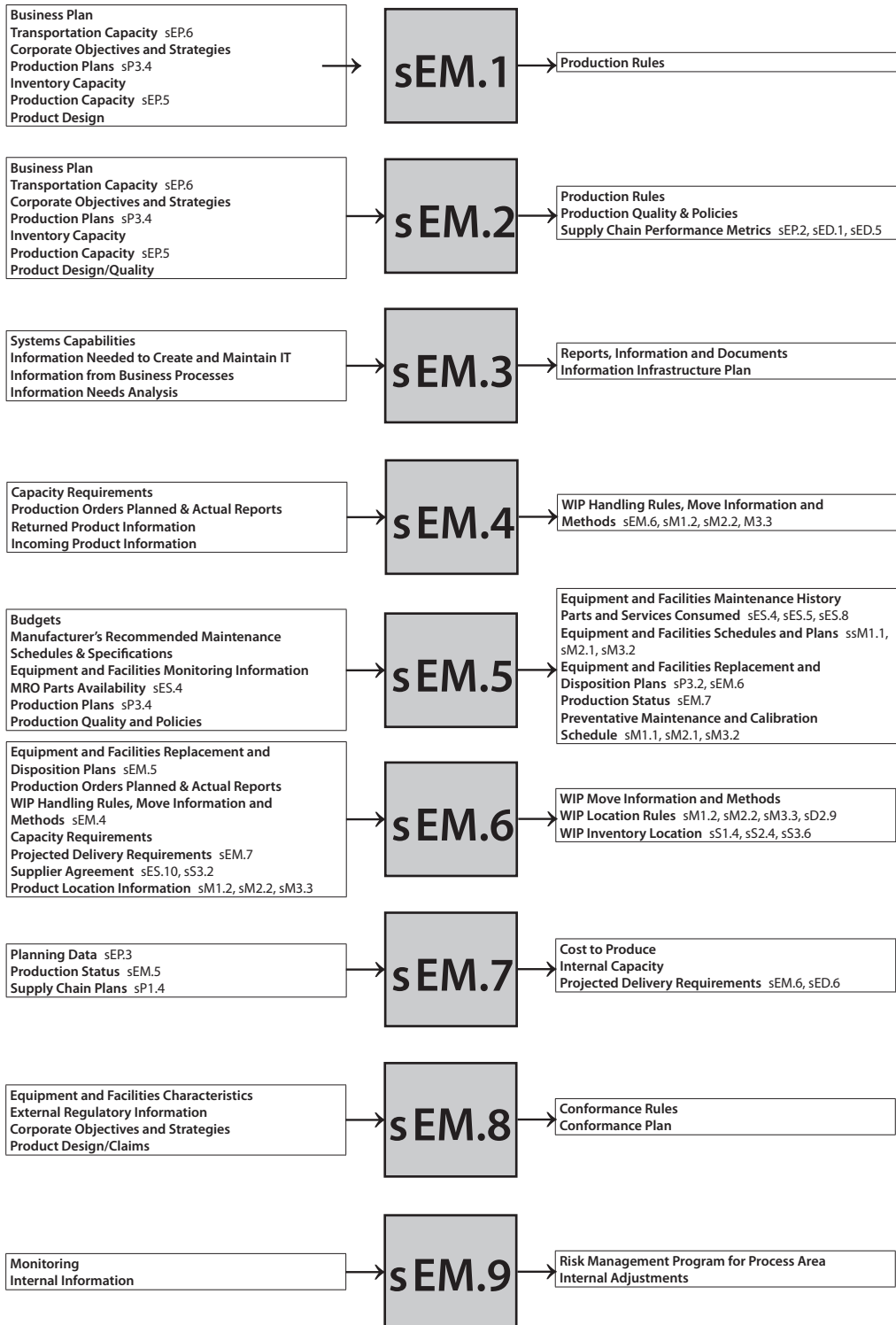
Performance Attributes	Metric
Supply Chain Reliability	Reportable Release Incidents Waste Processing Error
Supply Chain Responsiveness	Waste accumulation time
Supply Chain Agility	Waste storage capacity utilization
Supply Chain Costs	Waste storage costs as % of total Make costs
Supply Chain Asset Management	Hazardous waste as % of total waste Recyclable waste as % of total waste
Best Practices	Description/Definition
Daily HAZMAT inspection	Daily inspection of any hazardous waste storage areas
Waste accumulation Environmental Management System (EMS)	EMS covering waste accumulation processes
Storm water prevention plans	Storm water prevention and spill control plans for waste accumulation areas



sEM: Enable Make

The collection of processes associated with managing and monitoring Make process data, performance and relationships.

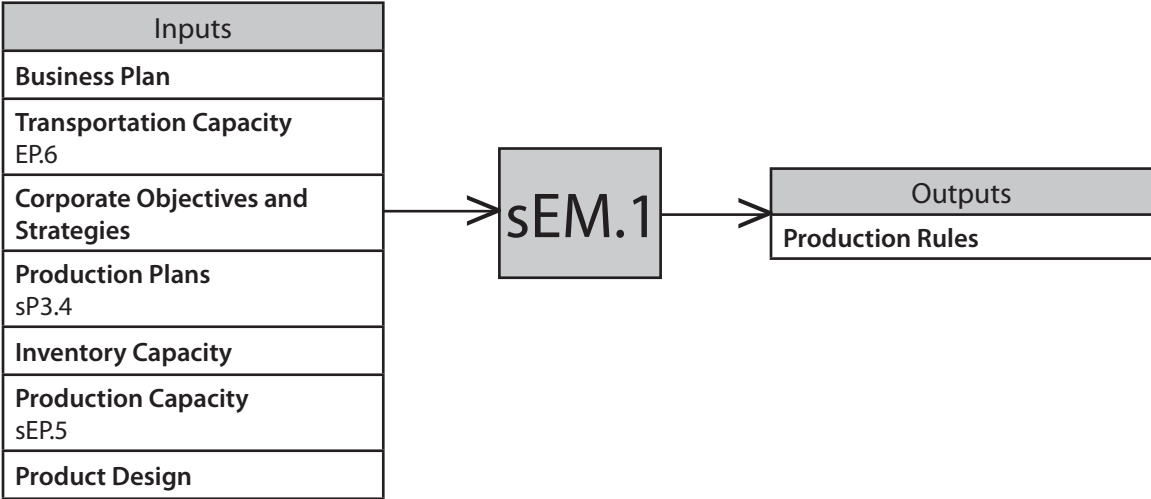
Process Categories	
sEM.1: Manage Production Rules	The process of establishing, maintaining, and enforcing rules for managing production details in line with business strategy, goals, and objectives. Production details include part/item master, bills of materials/formulas, routings, processes, equipment requirements, tooling, and other information specifying the method of production for a particular product.
sEM.2: Manage Production Performance	The process of developing and maintaining performance standards and analysis methods to compare actual production performance against the established standards. This process allows the development and implementation of a course of action to achieve targeted performance.
sEM.3: Manage Make Information	The process of managing, collecting, maintaining, and communicating information to support MAKE planning and execution processes. The information to be managed includes production, order and process data.
sEM.4: Manage In-Process Products (WIP)	The process of establishing and maintaining limits or levels, replenishment models, ownership, product mix and stocking locations for In-Process Product (WIP).
sEM.5: Manage Make Equipment and Facilities	The process of specifying maintaining and dispositioning MAKE's capital assets to operate the supply chain production processes. This includes repair, alteration, calibration and other miscellaneous items to maintain production capabilities.
sEM.6: Manage Transportation (WIP)	The process of transporting In-Process Product (WIP). This includes management of the activities associated with in transit handling and movement of In-Process Product (WIP).
sEM.7: Manage Production Network	The process of identifying and maintaining a network of intra-company production units that deliver specific semi-finished materials or product sets to the final production site.
sEM.8: Manage Make Regulatory Environment	The process of identifying and complying with regulatory documentation and process standards set by external entities (eg government)
sEM.9: Manage Supply Chain Make Risk	The process of managing Make risks within an overall supply Chain risk Program. This includes identifying and assessing make risks as well as and planning and implementing responses to Make risks. Make risks include potential events that could impact your ability to make on-time at a reasonable cost with good quality. The risks can occur internally within your organization, e.g. a matching breakdown or facility fire, or externally, e.g. a hurricane, that impacts your ability to Make.



Manage Production Rules

The process of establishing, maintaining, and enforcing rules for managing production details in line with business strategy, goals, and objectives. Production details include part/item master, bills of materials/formulas, routings, processes, equipment requirements, tooling, and other information specifying the method of production for a particular product.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Production Rules Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Production Rules
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Attribute-Based Process Planning	Computer aided process planning / recipe management
Automatic Generation / Configuration Of Tooling / Set-Up Instructions	Parametric driven (Group Technology - based) manufacturing design system
Design For Production	Table of manufacturing capacities or design envelopes (capacities; envelop sizes; tank, vessel or batch sizes)
Automated Engineering Specifications	Automated Intelligence (Heuristic) - based engineering specifications system
Implement an EMS	Implement an EMS
Automatic Notification When to Begin and When to Complete	Workflow/Groupware
Genealogy Tracking	Where-used listing of as-planned vs. as-built documentation
Pre-Defined Manufacturing Design Rules	Libraries of manufacturing capabilities or design envelopes
Document Control	Control who can create, revise and access information
Automated Links To Existing CAD & CAM Information	Electronic hypertext or links to existing database of detail/parts/setup sketches/drawings
On Line Access and Notification of Tooling and Equipment Information	Delivery of tooling and equipment details drawings
Electronic Documentation and Imaging	Graphical display of drawings, diagrams, recipes/formulas, specifications, instructions, etc., to all users

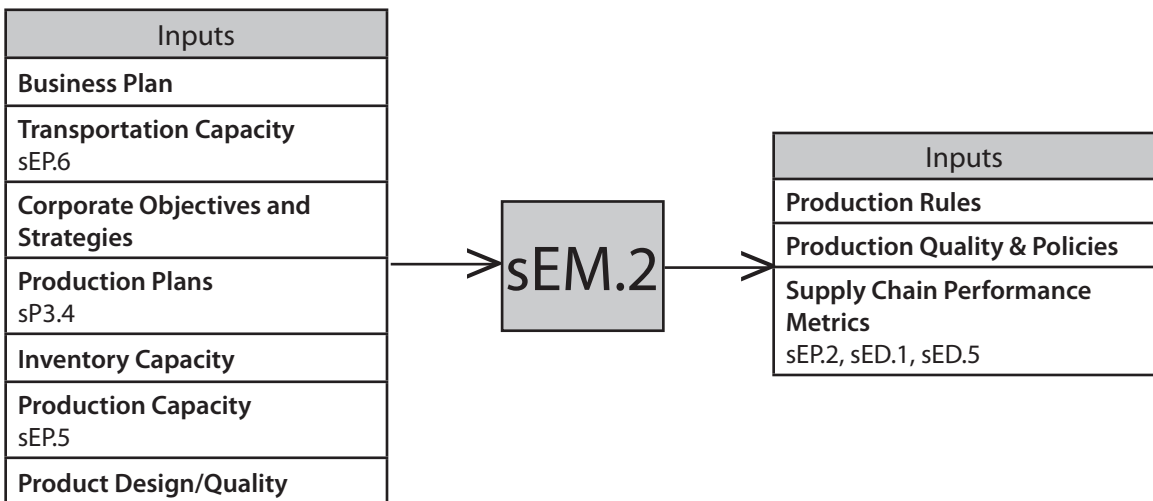


sEM.2

Manage Production Performance

The process of developing and maintaining performance standards and analysis methods to compare actual production performance against the established standards. This process allows the development and implementation of a course of action to achieve targeted performance.

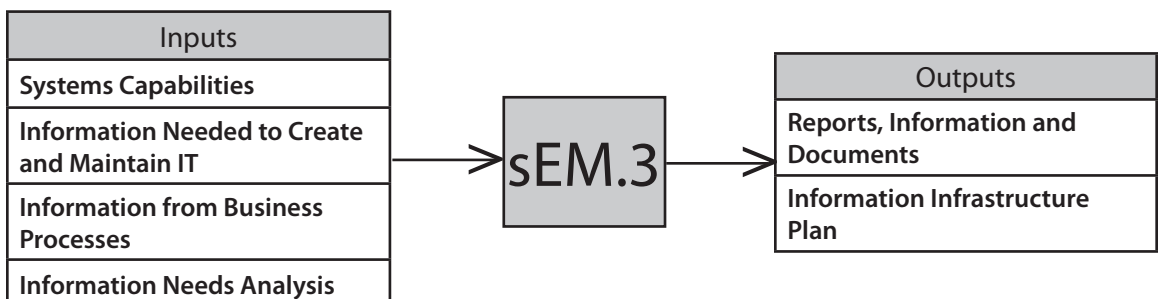
Performance Attributes	Metric
Supply Chain Reliability	# of staff-related environmental violations
Supply Chain Responsiveness	Manage Production Performance Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Production Performance
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Real Time Performance Measurement Reporting Systems	Systems to collect production information online generate reports upon request by operators, and track progress against schedule and standards.
Develop environmental performance standards.	Develop environmental performance standards.
Periodic Review of Standards	Process for establishing and maintaining review schedules
Implement an EMS	Implement an EMS
Standards and Measurements Aligned to Maximize Supply Chain Performance	Internal/external benchmarking, industry standards, customer/supplier alignment agreements, visibility of key performance indicators



Manage MAKE Information

The process of managing, collecting, maintaining, and communicating information to support MAKE planning and execution processes. The information to be managed includes production, order and process data.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage MAKE Information Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage MAKE Information
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
On-Demand Access to Available to Promise (ATP), Production Schedules and Inventory Status by Internal Operations and Customers	None identified
On-Demand Access of Production Information	Data Collection and Display Systems designed for efficient performance of value-added operations in production. This could include using PLC, Machine Interface, bar code, Radio Frequency Communication, Radio Frequency Identification, Magnetic Stripe, Smart Cards, etc., to enable data collection
Utilize Enterprise Information Systems	Enter, Process, and Deliver information about the manufacturing process to management using information systems that span the enterprise
Include product's environmental attributes	Include product's environmental attributes information
Continuous Improvement	Historical trending, cause and effect analysis, and Key Performance Indicators Scheduling reviews of processes for possible improvements

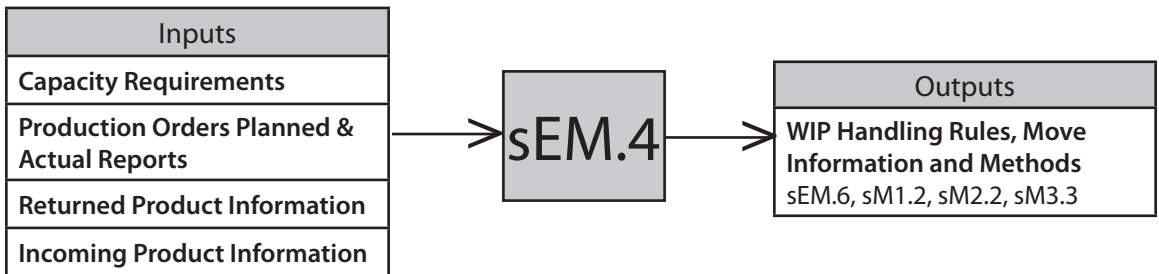


Manage In-Process Products (WIP)

The process of establishing and maintaining limits or levels, replenishment models, ownership, product mix and stocking locations for In-Process Product (WIP).

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage In-Process Products (WIP) Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage In-Process Products (WIP)
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Optimize Packing	No packing and unpacking time required. Recyclable or no containers where appropriate. No discarded material.
Dunnage Control	System data field to specify where the part / product shipping container should be removed. Best practice is to remove the dunnage as soon as possible unless part / product damage will result. Reuse of intermediate WIP containers for finished goods.
Statistical Test Count	The Statistical Test Count (STC) process is a method of validating inventory on-hand values by physically counting and reconciling a statistical sample of the entire inventory population. This sample is then extrapolated across the inventory population, which provides an indicative measure of entire inventory population. Furthermore, with extrapolation the net and gross percentage of error is determined.
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Minimizing In-Process Product (WIP)	WIP Storage Management System Efficient Space Utilization Implementing Pull Systems
In-Process Product (WIP) Handling Rules	Tracking, genealogy
Minimum Product Handling	Move high frequency used inventory close to point of use. For example, the system should provide the frequency of picks by part number so that high frequency picks can be moved to convenient locations or part pick quantities increased.
Best Practices cont.	Description/Definition cont.

Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
First In - First Out	Part / WIP location by date received for those parts that must be stocked or staged in a holding area

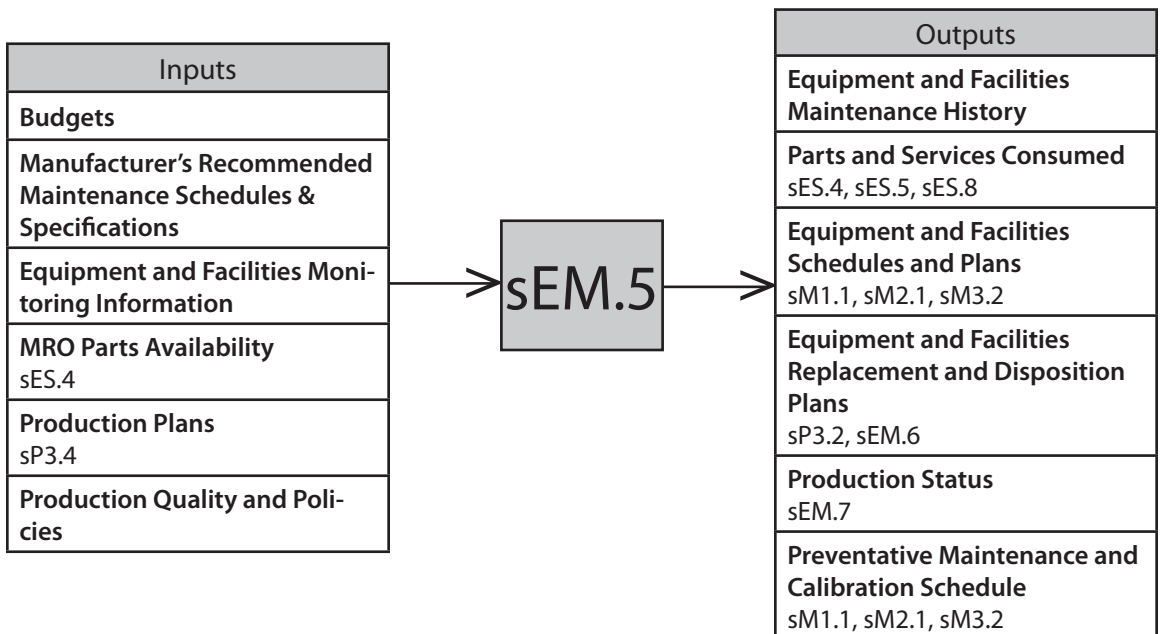


Manage MAKE Equipment and Facilities

The process of specifying maintaining and dispositioning MAKE's capital assets to operate the supply chain production processes. This includes repair, alteration, calibration and other miscellaneous items to maintain production capabilities.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage MAKE Equipment and Facilities Cycle Time, Supply chain down time due to compliance issues
Supply Chain Agility	None Identified
Supply Chain Costs	Energy efficient upgrades, Cost to Manage MAKE Equipment and Facilities, Number of worker absences due to poor IAQ
Supply Chain Asset Management	Actual Asset Life Maintenance Cost as % of Replacement Value, Equipment energy efficiency
Best Practices	Description/Definition
Predictive Maintenance Monitoring (Heat, Noise, Lubrication Composition & Vibration)	Database for equipment to contain expected results of analysis, allow entry of test readings, and have capability of generating desired reports, which could highlight suggested actions based upon readings obtained, track maintenance completed, contain a help-file to be consulted
Use non-toxic solvents	Use non-toxic solvents for machinery cleaning
Utilize non-toxic materials	Utilize non-toxic solvents and cleaning materials
Changeover Reduction / Continuous Improvement Program	Changeover process flow element identification, instructional directions to conduct changeover, and measurement tool, which can be used to prioritize and track results of improvement efforts. Software to identify operational constraints to the MAKE processes to assist in directing resources toward bottleneck functional areas.
Systematic Disposition Of Equipment	Rules for deciding appropriate disposition.
Minimize Capital Assets Required and Maintenance Costs	Outsourcing strategies including the use of Application Service Providers (ASPs), web-based maintenance/diagnostic assistance and MRO parts.
Supplier Managed Inventory of Parts	E.D.I. linkage of Inventory Information
Facility & Equipment Environmental / Safety Audit System	System software to list checklist items, report results of audit & forward actions to be taken
Utilize energy-star (or similar) equipment	Utilize energy-star (or similar) equipment whenever possible

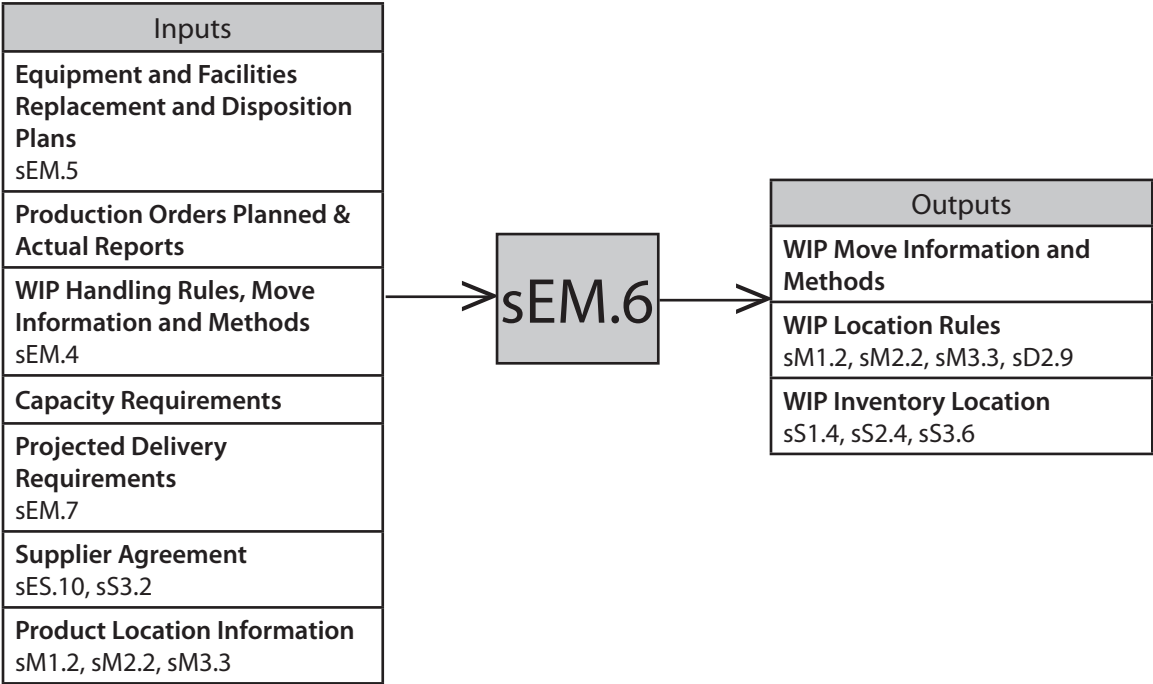
Best Practices cont.	Description/Definition cont.
Implement HAZMAT “pharmacy” system	Implement hazardous materials “pharmacy” system
Factory Floor Electronic Decision Making Information System	Software to capture actual performance history / costs of operations with capability of predicting “best cost action plans” relating to maintaining equipment and facilities.
Total Preventative Maintenance Program	Automatically generated TPM repair schedules integrated with MRP systems, electronic equipment repair history, parts listings, part stores inventory & reorder points, automatic store room parts purchases, Shop floor access to electronic data base of equipment line drawings, electrical wiring diagrams, parts listing reference guide and part cost lists.



Manage Transportation (WIP)

The process of transporting In-Process Product (WIP). This includes management of the activities associated with in transit handling and movement of In-Process Product (WIP).

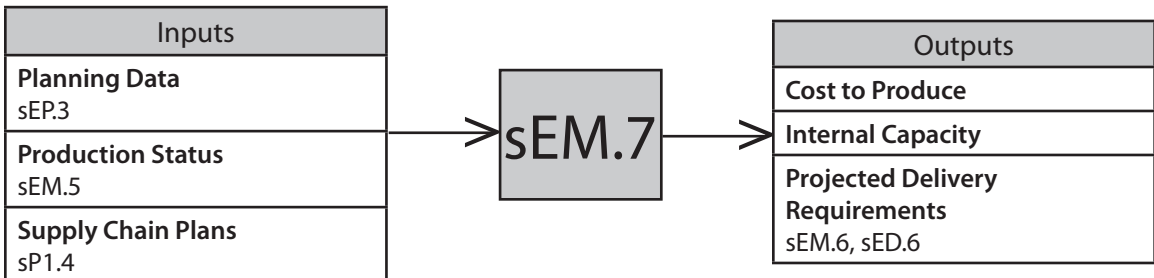
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Transportation (WIP) Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Packaging volume, % of pallets that are reusable, % of trucks using retread tires, % of vehicle fuel derived from alternative fuels, Cost to Manage Transportation, % of paints used that are non-toxic
Supply Chain Asset Management	Packaging as % of total material
Best Practices	Description/Definition
Utilize retread tires	Utilize retread tires
Utilize non-wood or recycled pallets	Utilize non-wood pallets or recycled pallets
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Utilize alternative fuel vehicles	Utilize alternative fuel vehicles
Reduce In-Process Product (WIP) Handling	Reduction of WIP handling through automation (i.e. AGVs and ASRS) and process improvement (i.e. reduction of handling steps, shorter move paths)
Short Move Paths	Software that allows for input of the distance that particular parts/WIP need to be moved. This software then need to provide a report based on the cubic feet of material times distance moved by part number.



Manage Production Network

The process of identifying and maintaining a network of intra-company production units that deliver specific semi-finished materials or product sets to the final production site.

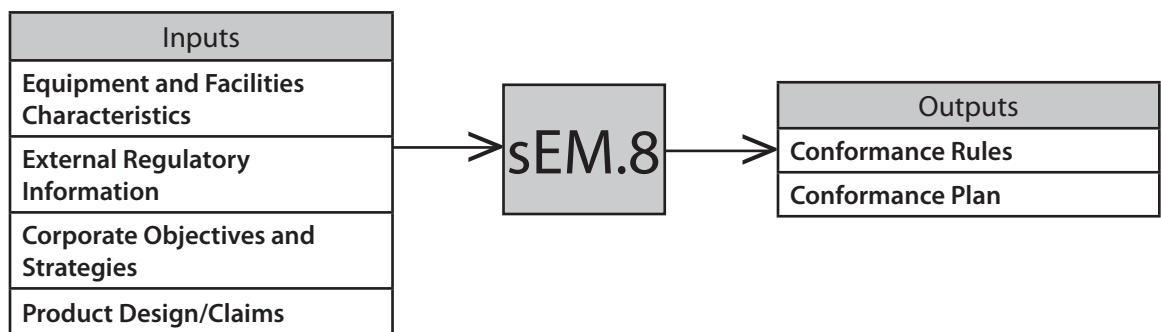
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Production Network Cycle Time, Supply chain down time due to compliance issues
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Production Network
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Collaborative Planning/Scheduling	Interactive, on-line planning/scheduling systems. Capacity planning systems with accurate production capability data.
JIT Environment	Schedule visibility, on-line communications between source and demand
Production Reporting/Status	Real time monitoring of production status and In-Process Product (WIP)



Manage Make Regulatory Environment

The process of identifying and complying with regulatory documentation and process standards set by external entities (eg government)

Performance Attributes	Metric
Supply Chain Reliability	% of employees trained on environmental requirements
Supply Chain Responsiveness	Manage MAKE Regulatory Compliance Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage MAKE Regulatory Compliance, Pollution Prevention Ratio
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Automated Conformance Monitoring And Control	Internal automatic notification of conformance, including holding of product until requirements are met
Automatic Generation And Submission Of Conformance Documents	Software specific to industry regulations and standards (e.g. may be software to produce MSDS documents, or FDA requirements, etc.)
Implement pollution prevention program	Implement rigorous and comprehensive pollution prevention program and include environmentally preferable purchasing
Maintaining Repository of Current Regulatory Requirements	Electronic subscription and publication of conformance documentation. Electronic Document Management System features.
Implement an EMS	Implement an EMS



Manage Supply Chain Make Risk

The process of managing Make risks within an overall supply Chain risk Program. This includes identifying and assessing make risks as well as and planning and implementing responses to Make risks. Make risks include potential events that could impact your ability to make on-time at a reasonable cost with good quality. The risks can occur internally within your organization, e.g. a matching breakdown or facility fire, or externally, e.g. a hurricane, that impacts your ability to Make. Response planning includes: mitigation, either reducing the impact of a Make risk event or reducing the likelihood it will occur; transfer; acceptance. An organization has a high level of control and flexibility of action concerning internal Make risks, so they are prime candidates for control Response planning can be aggregated for make risks across the organization.

Performance Attributes	Metric
Supply Chain Reliability	Supplier Mitigation Plans Implemented (percent), Value at Risk (Make), Age of Supplier Risk Data (months), VAR of Internal Process Performance, Age of Product / Customer Risk Data (months), VAR of Supplier Performance, VAR of product/customer performance -
Supply Chain Responsiveness	External Event Response (average days)
Supply Chain Agility	Industry Benchmark Comparison (%), Hedge Rating (Inventory DOS for risk management), Options Rating (0-100%), Internal Event Response (average days)
Supply Chain Costs	Mitigation Cost (\$), Mitigation cost by Event (\$), Assessment / Risk Management Costs (\$)
Supply Chain Asset Management	Residual Risk (\$), Individual Process Area Event Rating (EVAR) (\$), Mitigated Risk (\$), Event Risk (EVAR) (\$), Supply / Customer / Product Base Rated (%), Gross Risk (\$)
Best Practices	Description/Definition
Supply Chain Business Rules Configured to mitigate risk	This practice involves establishing business rules (e.g., customer priority, supplier priority, production routing, transportation routing, etc.) based on minimizing the risk to the supply chain. Under this practice, business rules are established or configured in response to the corporate risk management plan with a goal of reducing either the likelihood of a disruption occurring or the impact to the supply chain should a disruption occur.

Best Practices cont.	Description/Definition cont.
	Business rule reconfiguration typically includes an assessment of the impact of each rule change on the overall supply chain before actual implementation.
Supply Chain Risk Monitoring	Once areas of risk have been identified, an organization needs to monitor their internal and external environment. This helps them to predict when risky events are becoming more likely. It also helps to identify new risks and is tightly linked to the best practice of Supply Chain Risk Identification.
Supply Chain Risk Management	Supply chain risk management is the systematic identification, assessment and mitigation of potential disruptions in logistics networks with the objective to reduce their negative impact on the logistics network's performance.
Supply Chain Risk Assessment	Supply Chain Risk assessment provides management with an understanding of where the greatest risks may exist in order to prioritize resources for risk mitigation and management. Performing such assessments will involve clarifying the nature of the risk, understanding conditions that may lead to the event, knowing how frequently such events have happened or can be expected to happen, and the potential impact of such events. the team can then prioritize addressing the risks.
Supply Chain Information Configured to Minimize Risk	This practice involves managing supply chain information networks to minimize the risk to the supply chain. This includes information sharing with partners as well as internal locations. This helps all parties to be quickly informed of a real or potential disruption and respond quickly and appropriately to minimize the disruption impact.
Supply Chain Risk Identification	A key aspect of supply chain risk management is identification. Identification involves creating a list of potential events that could harm any aspect of the supply chain's performance. Risk identification allows an organization to take steps to create plans to manage risks before they occur. this is typically more cost effective then waiting to react to adverse events when they occur.
Supply Chain Network Configured to Mitigate Risk	This practice relies on a risk evaluation of the supply chain to guide the design of the supply chain network. Node locations, transportation routes, capacity size and location, number of suppliers, number of production locations, etc. are all determined in a fashion that mitigates potential disruptions to the ability to deliver product and service to the end customer.
	This practice relies on the information collected through risk identification and risk assessment processes to identify nodes that are at a high risk of disruption due to the location of the node. Location specific risks can include tactical strike risks, natural disaster risks, single point of failure risks, etc.

sEM.9

Best Practices cont.

Crisis Communications
Planning

Description/Definition cont.

Open communication is necessary for effective risk management, where the term “open” refers to the possibility to directly reach the right person – who can better handle the information about a crisis situations – wherever in the organization. Managers require direct communication channels up, down and across their business units to help identify risks and take appropriate actions.



Deliver

The processes associated with performing customer-facing order management and order fulfillment activities.

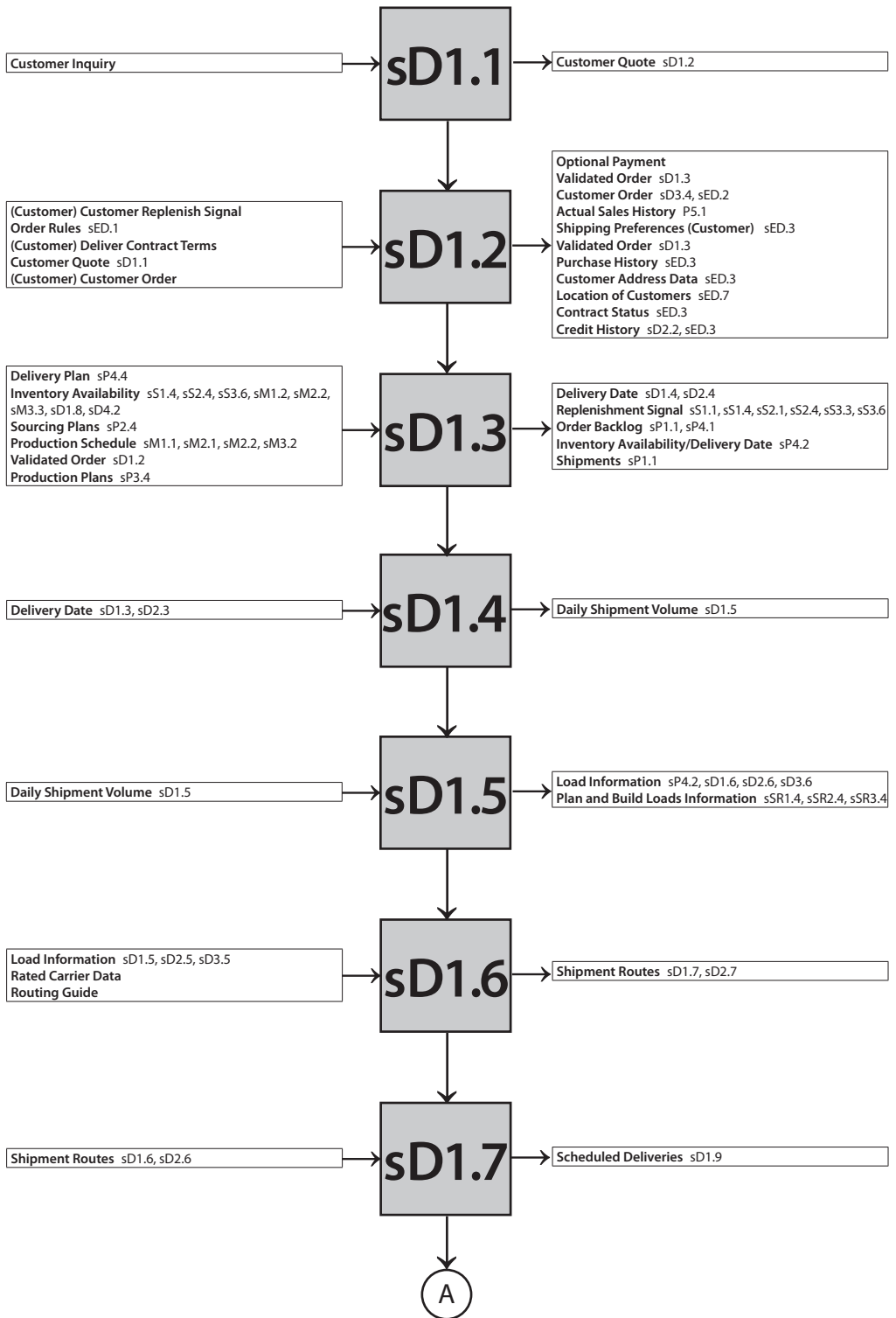
Process Categories

sD1: Deliver Stocked Product	The process of delivering product that is sourced or made based on aggregated customer orders, projected orders/demand and inventory re-ordering parameters. The intention of Deliver Stocked Product is to have the product available when a customer order arrives (to prevent the customer from looking elsewhere). For services industries, these are services that are pre-defined and off-the-shelf (e.g. standard training). Products or services that are 'configurable' cannot be delivered through the Deliver Stocked Product process, as configurable products require customer reference or customer order details.
sD2: Deliver Make-to-Stock Product	The processes of delivering product that is sourced, configured, manufactured, and/or assembled from standard raw materials, parts, ingredients or sub-assemblies, in response to a specific firm customer order. A reference to the customer order is exchanged with the sourcing or make process and attached to or marked on the product. Products in stock are identifiable by customer order through labeling and inventory data management. Examples include assigning a serial number, lot number or batch number to a customer order prior to Make or Source, processes that generate a bill-of-materials for the associated Make process (e.g. configure-to-order and assemble-to-order) and the 'special order' process in retail.
sD3: Deliver Engineer-to-Order Product	The process of obtaining, responding to, and allocating resources for a customer order that has unique requirements or specifications and delivering a product that is partially or fully designed, redesigned, manufactured, and/or assembled from a bill of materials or recipe that includes one or more custom parts or ingredients. Design will begin only after the receipt and validation of a firm customer order.
sD4: Deliver Retail Product	Deliver Retail Products are the processes used to acquire, merchandise, and sell finished goods at a retail store. A retail store is a physical location that sells products (and services) direct to the consumer using a point of sale process (manual or automated) to collect payment. Merchandising at a store level is the stocking and restocking of products in designated storage locations to generate sales in a retail store.
sED: Enable Deliver	The collection of processes associated with managing and monitoring Deliver process data, performance and relationships.

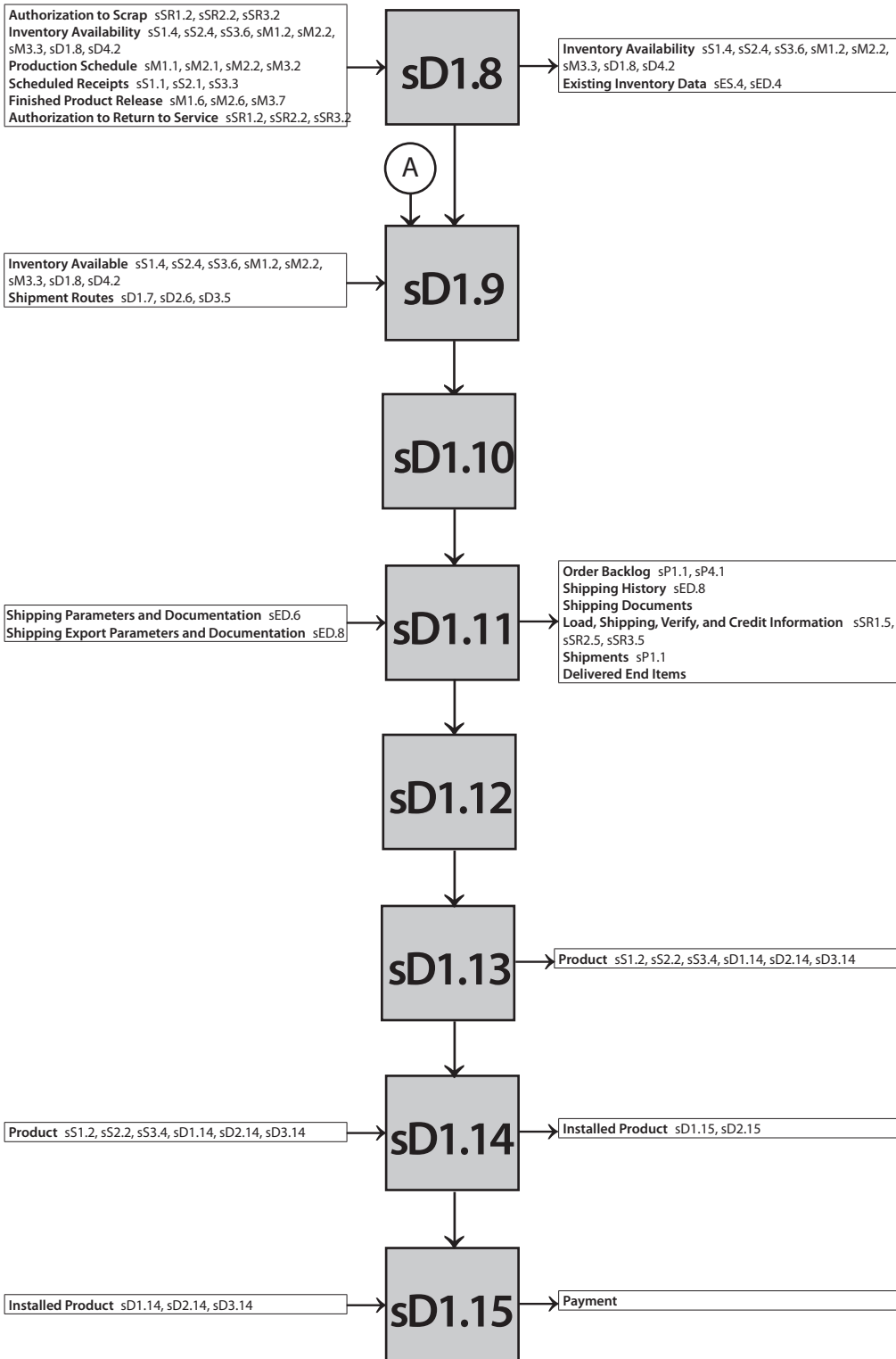
Deliver Stocked Products

The process of delivering product that is sourced or made based on aggregated customer orders, projected orders/demand and inventory re-ordering parameters. The intention of Deliver Stocked Product is to have the product available when a customer order arrives (to prevent the customer from looking elsewhere). For services industries, these are services that are pre-defined and off-the-shelf (e.g. standard training). Products or services that are 'configurable' cannot be delivered through the Deliver Stocked Product process, as configurable products require customer reference or customer order details.

Performance Attributes	Metric
Supply Chain Reliability	Perfect Order Fulfillment
Supply Chain Responsiveness	Deliver Cycle Time, Order Fulfillment Cycle Time
Supply Chain Agility	Upside Deliver Adaptability, Downside Deliver Adaptability, Upside Deliver Flexibility
Supply Chain Costs	Cost to Deliver, Finished Goods Inventory Days of Supply, Order Management Costs
Supply Chain Asset Management	Return on Supply Chain Fixed Assets, Return on Working Capital, Cash-To-Cash Cycle Time
Best Practices	Description/Definition
Postponement	Postponement (delayed differentiation) is a supply chain concept where a product is kept as long as possible in a generic state. Differentiation of the generic product into a specific end-product is shifted closer to the consumer by postponing identify changes, such as assembly or packaging, to the last possible supply chain location.
Electronic Catalogues/Malls	None identified
Efficient Consumer Response (ECR); Quick Response	Demand Planning, Deployment, Scheduling
Internet Ordering	None identified
Rapid Replenishment, VMI, EDI	None identified



sD1



Process Inquiry and Quote

Receive and respond to general customer inquiries and requests for quotes

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Process Inquiry & Quote Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Process Inquiry & Quote
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Quote Capability, without Reserving Inventory, Which Can Be Converted into an Order in a Single Step	None identified
Single Point of Contact for All Order Inquiries (Including Order Entry)	None identified



Receive, Enter and Validate Order

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
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Receive, Enter & Validate Order Cycle Time, Order Fulfillment Dwell Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive, Enter & Validate Order
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Remote (Sales, Customers) Order Entry Capability	None identified
Enable Real-Time Visibility into Backlog, Order Status, Shipments, Scheduled Material Receipts, Customer Credit History, and Current Inventory Positions	None identified
Value Pricing Based on "Cost to Serve"; EDLP; Cost Plus Pricing	Activity Based Costing; Integrated Order Management by Customer by Line Item
Automatic Multi-level Credit Checking; Dollar Limits; Days Sales Outstanding; Margin Testing	Integrated Order/Financial Management
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
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

Inputs
(Customer) Customer Replenish Signal
Order Rules sED.1
(Customer) Deliver Contract Terms
Customer Quote sD1.1
(Customer) Customer Order



Outputs
Optional Payment
Validated Order sD1.3
Customer Order sD3.4, sED.2
Actual Sales History sP5.1
Shipping Preferences (Customer) sED.3
Validated Order sD1.3
Purchase History sED.3
Customer Address Data sED.3
Location of Customers sED.7
Contract Status sED.3
Credit History sD2.2, sED.3

Reserve Inventory and Determine Delivery Date

Inventory (both on hand and scheduled) is identified and reserved for specific orders and a delivery date is committed and scheduled.

Performance Attributes	Metric
Supply Chain Reliability	Delivery Performance to Customer Commit Date, Fill Rate, % of Orders Delivered In Full
Supply Chain Responsiveness	Reserve Inventory & Determine Delivery Date Cycle Time, Order Fulfillment Dwell Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Reserve Resources & Determine Delivery Date
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Include environmental costs	Include environmental costs in inventory carrying costs
Inventory Allocation Exception Process is Clearly Defined and Jointly Owned by Manufacturing and Sales	None identified
Priority-Based Inventory Reservations, for Key Customers, with FIFO Allocation for All Others	None identified
Automatic Reservation of Inventory and Dynamic Sourcing of Product for Single Shipment to Customer	Integrated order management system that treats each order line as a separate order with integration to inventory source and status; Real-time inventory management
Establish spill controls	Establish spill controls for finished goods inventory storage
Available-to-Promise (ATP)	Available-to-Promise (ATP) provides an availability and feasibility check concerning a customer request or a customer order.
EDI Links between Manufacturing and Distributor to Achieve Visibility of Complete Finished Goods Inventory and Expected Shipments	None identified

Inputs
Delivery Plan sP4.4
Inventory Availability sS1.4, sS2.4, sS3.6, sM1.2, sM2.2, sM3.3, sD1.8, sD4.2
Sourcing Plans sP2.4
Production Schedule sM1.1, sM2.1, sM2.2, sM3.2
Validated Order sD1.2
Production Plans sP3.4



Outputs
Delivery Date sD1.4, sD2.4
Replenishment Signal sS1.1, sS1.4, sS2.1, sS2.4, sS3.3, sS3.6
Order Backlog sP1.1, sP4.1
Inventory Availability/Delivery Date sP4.2
Shipments sP1.1

sD1.4

Consolidate Orders

The process of analyzing orders to determine the groupings that result in least cost/best service fulfillment and transportation.

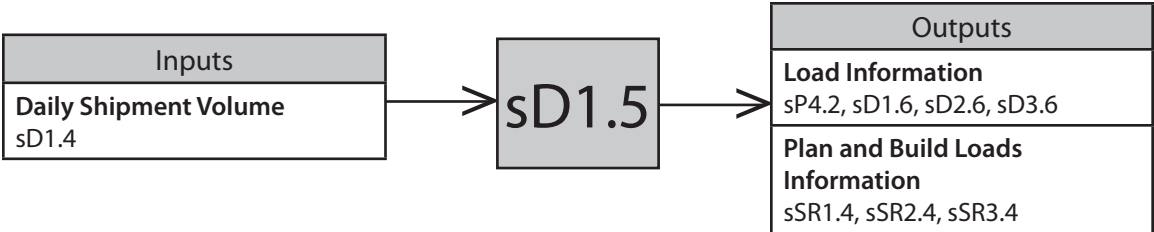
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Consolidate Orders Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Consolidate Orders
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Consolidate Orders by Customer, Source, Traffic Lane, Carrier, Etc.	Integrated load planning and building with warehouse management
Consolidate to minimize energy consumption	Consolidate to minimize fuel/energy consumption
Combine Consolidation Needs with Other Products/Divisions/Companies	None identified



Build Loads

Transportation modes are selected and efficient loads are built.

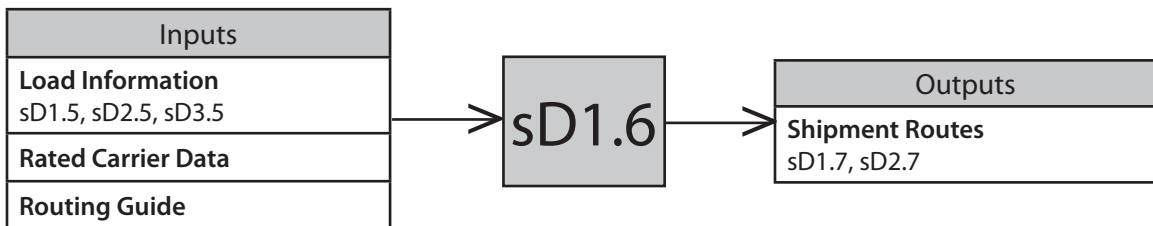
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Build Loads Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Quantity per shipment, Cost to Build Loads
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Consolidation of Inbound and Outbound Requirements	Integrated inbound/outbound transportation planning
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer’s inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Build Load in Stop Sequence	Integrated inbound/outbound transportation planning (i.e. 1st truck destination loaded last, etc.).
Select carriers with good records	Select carriers with good environmental records
Select carriers with EMS	Select carriers that have adopted an EMS or otherwise demonstrated environmental commitment
CRP & VMI Loads Optimized for Utilization	Integration with CRP/VMI vendor systems



Route Shipments

Loads are consolidated and routed by mode, lane and location.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Route Shipments Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Route Shipments, Energy Costs
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Shipment Tracking and Tracing	Satellite communications, GPS, RFID
Consolidation of Carriers	Transportation modeling and rate analysis
CRP/VMI	Integrated Load Building; Routing & Scheduling with Advanced Ship Notice (ASN)
Route to minimize fuel consumption	Route to minimize fuel consumption



Select Carriers and Rate Shipments

Specific carriers are selected by lowest cost per route and shipments are rated and tendered.

Performance Attributes	Metric
Supply Chain Reliability	% of suppliers meeting environmental metrics/criteria
Supply Chain Responsiveness	Select Carriers & Rate Shipments Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Select Carriers & Rate Shipments
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Select carriers with EMS	Select carriers that have adopted an EMS or otherwise demonstrated environmental commitment
Select complaint carriers	Select carriers that have not violated environmental laws
Select carriers using retread tires	Select carriers using retread tires
Select Carriers by Least Cost per Shipment and Rate Using Actual Rates Prior to Release to Billing	Rules based carrier selection and actual rate database

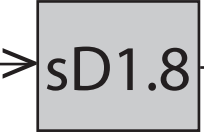


Receive Product from Source or Make

The activities such as receiving product, verifying, recording product receipt, determining put-away location, putting away and recording location that a company performs at its own warehouses. May include quality inspection.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Receive Product from Source or Make Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Product from Source or Make
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Automatic Identification	Bar Coding & Radio Frequency Communications
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.
Download P.O. & Advanced Ship Notices for Automated Receiving and Put Away	Integration with Procurement Systems & Electronic Commerce with Vendors
Merge-in-Transit	Merge-in-Transit is a practice to combine items from multiple sources into a single customer shipment. This includes items on stock in the distribution center, from which the shipment is sent, items on stock in other distribution centers, items on stock elsewhere (e.g. at a plant or a supplier) as well as make-to-order items. The items to be merged are cross-docked from inbound receipt to outbound shipping. Merging is usually performed in a shipper's distribution center (DC) or in a carrier's terminal.

Inputs
Authorization to Scrap sSR1.2, sSR2.2, sSR3.2
Inventory Availability sS1.4, sM1.2
Production Schedule sM1.1
Scheduled Receipts sS1.1
Finished Product Release sS1.4, sM1.6
Authorization to Return to Service sSR1.2, sSR2.2, sSR3.2

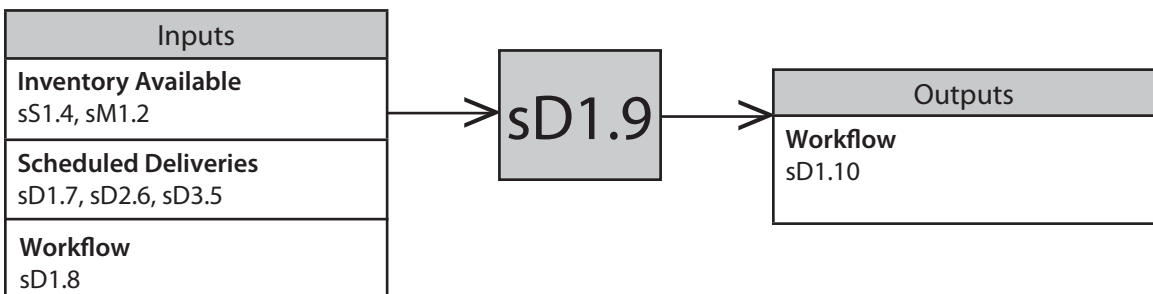


Outputs
Inventory Availability sP1.2
Existing Inventory Data sES.4, sED.4
Workflow sD1.9

Pick Product

The series of activities including retrieving orders to pick, determining inventory availability, building the pick wave, picking the product, recording the pick and delivering product to shipping in response to an order.

Performance Attributes	Metric
Supply Chain Reliability	Fill Rate
Supply Chain Responsiveness	Pick Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Pick Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Dynamic Simulation of Picking Requirements Optimized for Labor, Cost, and Time	Rules based picking logic and simulation
Use of Speed Racks for Automated Material Handling	None identified
Merge-in-Transit	Merge-in-Transit is a practice to combine items from multiple sources into a single customer shipment. This includes items on stock in the distribution center, from which the shipment is sent, items on stock in other distribution centers, items on stock elsewhere (e.g. at a plant or a supplier) as well as make-to-order items. The items to be merged are cross-docked from inbound receipt to outbound shipping. Merging is usually performed in a shipper's distribution center (DC) or in a carrier's terminal.
Wave picking	A practice used in many DC operations to increase labor picking productivity and reduce the labor cost per pick. In some DC's, orders are scheduled to be picked when they are received. Wave picking consolidates orders into "waves" where multiple orders with similar characteristics are picked at one time. Orders can be consolidated by customer, geography, or any other criteria that makes sense for the DC operation.



Pack Product

The activities such as sorting / combining the products, packing / kitting the products, paste labels, barcodes etc. and delivering the products to the shipping area for loading.

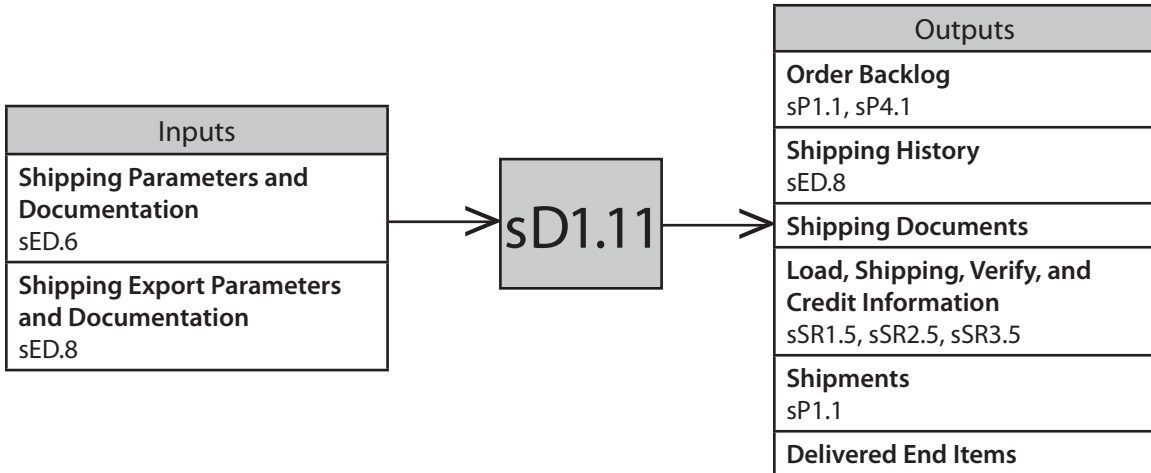
Performance Attributes	Metric
Supply Chain Reliability	% correct material documentation
Supply Chain Responsiveness	Pack Product Cycle Times
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Pack Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
None Identified	None Identified



Load Vehicle & Generate Shipping Docs

The series of tasks including placing/loading product onto modes of transportation, and generating the documentation necessary to meet internal, customer, carrier and government needs. Shipping documentation includes the invoice. Optionally verify customer credit.

Performance Attributes	Metric
Supply Chain Reliability	Documentation Accuracy, Delivery Performance to Customer Commit Date
Supply Chain Responsiveness	Load Product & Generate Shipping Documentation Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Load Product & Generate Shipping Documentation
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Shipment Tracking	None identified
Full Visibility of Credit History by Shipping Personnel	None identified
Advanced Shipping Notices & UCC128 Container Labeling	Bar coding; EDI; integrated transportation/warehouse management
Carrier Agreement	Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions.
Electronic Generation and Download of Shipping Documents	None identified
Integrated Credit Checking	Interface to supplier's shipping system to financials
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.



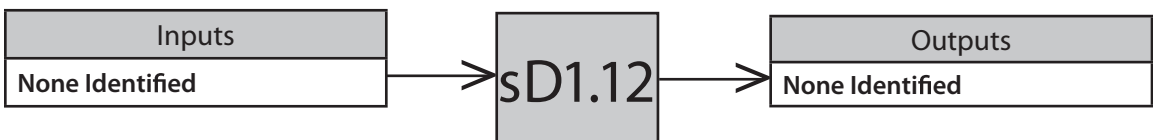
sD1.12

Ship Product

The process of shipping the product to the customer site.

Performance Attributes	Metric
Supply Chain Reliability	Delivery Performance to Customer Commit Date, % of Orders Delivered In Full
Supply Chain Responsiveness	Ship Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Ship Product
Supply Chain Asset Management	None Identified

Best Practices	Description/Definition
Shipment Tracking	None identified
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.
Retrieve packaging after installation	Retrieve packaging after installation for reuse



Receive and Verify Product by Customer

The process of receiving the shipment by the customer (either at customer site or at shipping area in case of self-collection) and verifying that the order was shipped complete and that the product meets delivery terms.

Performance Attributes	Metric
Supply Chain Reliability	Delivery Performance to Customer Commit Date, Perfect Condition, % of Orders Delivered In Full
Supply Chain Responsiveness	Receive & Verify Product by Customer Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive & Verify Product by Customer
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Advanced Shipping Notices & UCC128 Container Labeling	Bar coding; EDI; integrated transportation/warehouse management

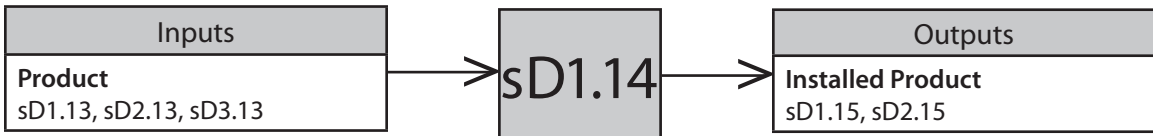


sD1.14

Install Product

When necessary, the process of preparing, testing and installing the product at the customer site. The product is fully functional upon completion.

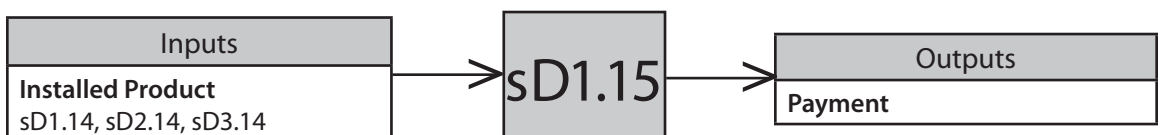
Performance Attributes	Metric
Supply Chain Reliability	Perfect Condition, % Of Faultless Installations
Supply Chain Responsiveness	Install Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Install Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Joint Service Agreements to Document Acceptable Service Levels in Terms of Installation Costs, Installation Cycle Time, Etc.	Collaborative planning tools with the Source suppliers. (This would be effective between customer and supplier, and between internal functions such as Field Service, Manufacturing, Marketing and Order Management)



Invoice

A signal is sent to the financial organization that the order has been shipped and that the billing process should begin and payment be received or be closed out if payment has already been received. Payment is received from the customer within the payment terms of the invoice.

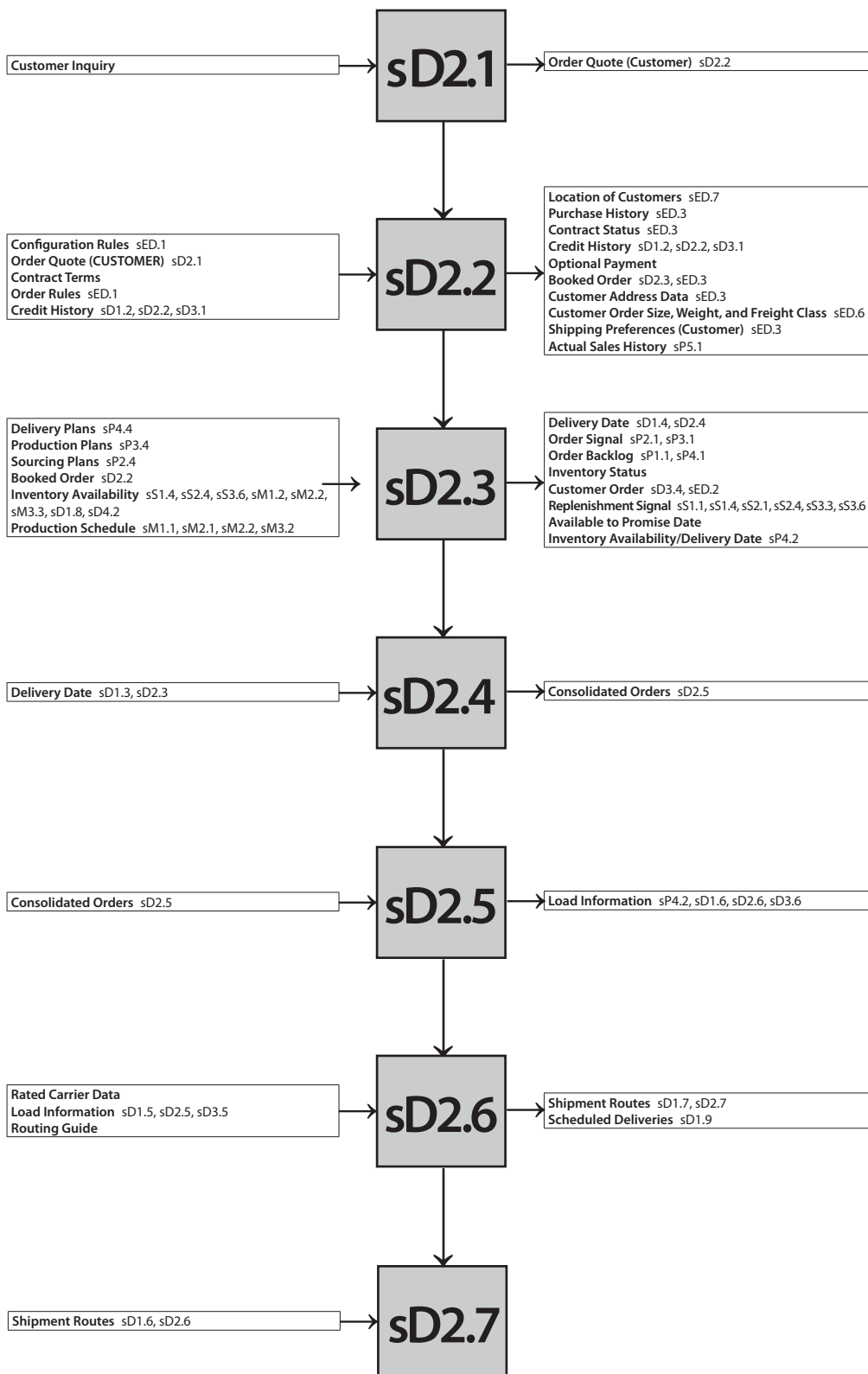
Performance Attributes	Metric
Supply Chain Reliability	% of Faultless Invoices, Documentation Accuracy
Supply Chain Responsiveness	Invoice Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Invoice
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Utilize EDI and EFT for Payment to Speed Closing of Receivables and to Reduce Processing Costs	EDI transaction and network services
Electronic Transfer of Shipment Information to Finance	None identified
Provide Visibility to and Quickly Escalate Delinquent Accounts for Resolution	Integrated accounts receivables

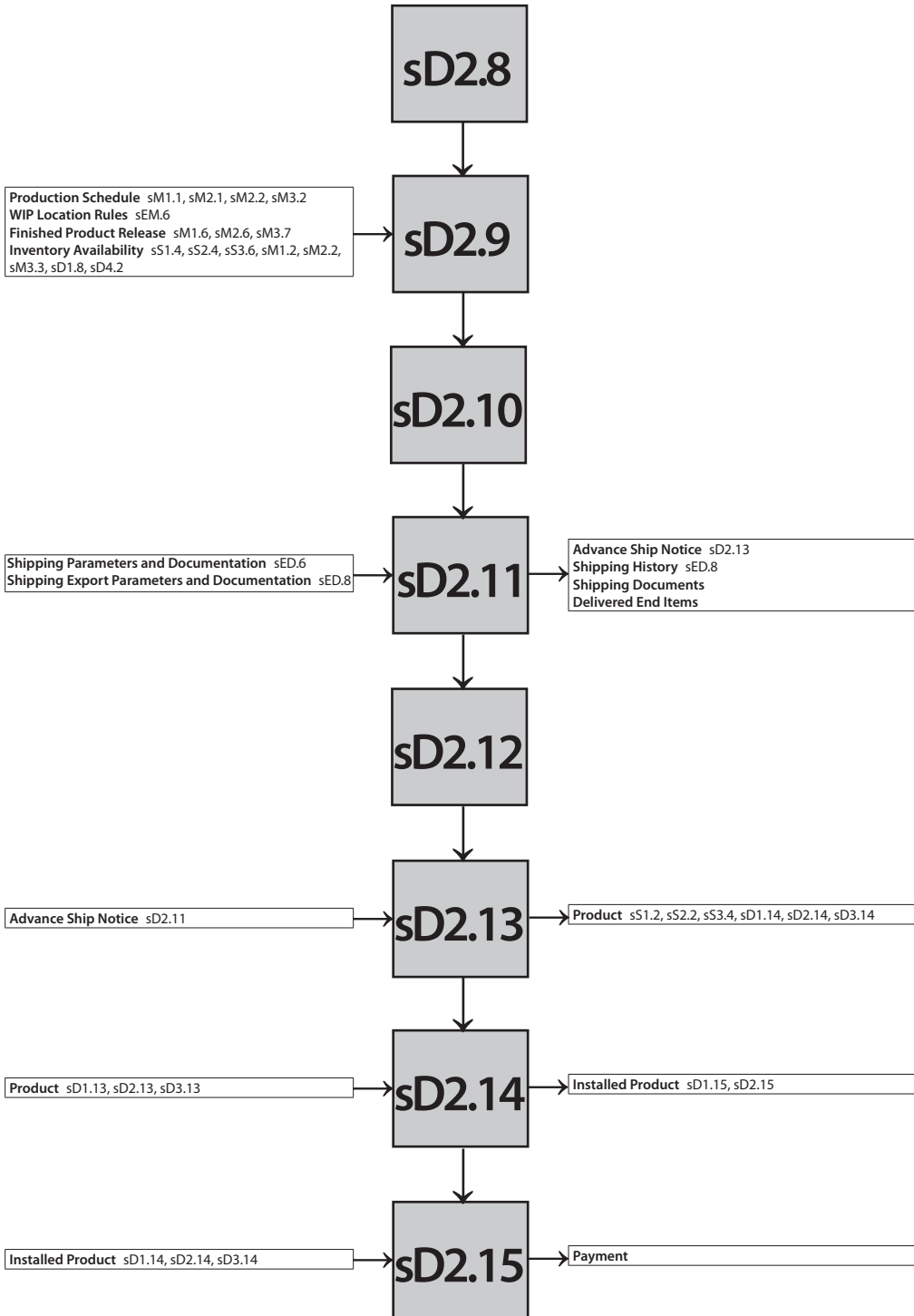


Deliver Make-to-Order Product

The processes of delivering product that is sourced, configured, manufactured, and/or assembled from standard raw materials, parts, ingredients or sub-assemblies, in response to a specific firm customer order. A reference to the customer order is exchanged with the sourcing or make process and attached to or marked on the product. Products in stock are identifiable by customer order through labeling and inventory data management. Examples include assigning a serial number, lot number or batch number to a customer order prior to Make or Source, processes that generate a bill-of-materials for the associated Make process (e.g. configure-to-order and assemble-to-order) and the 'special order' process in retail.

Performance Attributes	Metric
Supply Chain Reliability	Perfect Order Fulfillment
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Deliver Cycle Time
Supply Chain Agility	Downside Deliver Adaptability, Upside Deliver Flexibility, Upside Deliver Adaptability
Supply Chain Costs	Cost to Deliver, Energy Costs, Finished Goods Inventory Days of Supply
Supply Chain Asset Management	Cash-To-Cash Cycle Time, Return on Working Capital, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
Postponement	Postponement (delayed differentiation) is a supply chain concept where a product is kept as long as possible in a generic state. Differentiation of the generic product into a specific end-product is shifted closer to the consumer by postponing identify changes, such as assembly or packaging, to the last possible supply chain location.





Process Inquiry and Quote

Receive and respond to general customer inquiries and requests for quotes.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Process Inquiry & Quote Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Process Inquiry & Quote
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Quote Capability, without Reserving Inventory, Which Can Be Converted into an Order in a Single Step	None identified
Quote Capability, without Reserving Inventory, Which Can be Converted into an Order, But Does Not Generate Build Signal or Reserve Inventory Capacity	None identified
Single Point of Contact for All Order Inquiries (Including Order Entry)	None identified



Receive, Configure, Enter and Validate Order

Receive orders from the customer and enter them into a company's order processing system. Orders can be received through phone, fax, or through electronic media. Configure your product to the customer's specific needs, based on standard available parts or options. "Technically" examine order to ensure an orderable configuration and provide accurate price. Check the customer's credit. Optionally accept payment.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Receive, Configure, Enter & Validate Order Cycle Time, Order Fulfillment Dwell Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive, Enter & Validate Order
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Automated Configuration Management	Configuration
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
Value Pricing Based on "Cost to Serve"; EDLP; Cost Plus Pricing	Activity Based Costing; Integrated Order Management by Customer by Line Item
Enable Real-Time Visibility into Backlog, Order Status, Shipments, Scheduled Material Receipts, Customer Credit History, and Current Inventory Positions	None identified
Order Entry is Organized by Customer Segment Customers Receive Differentiated Service Based on Volume of Business Customer Team is Empowered to Fully Service Customer Requests, Including Formal Orders and Ad Hoc Requests Customers Have One Point of Conta	None identified
Remote (Sales, Customers) Order Entry Capability	None identified
Automatic Multi-level Credit Checking: Dollar Limits; Days Sales Outstanding; Margin Testing	Integrated Order/Financial Management

Inputs
Configuration Rules sED.1
Order Quote (CUSTOMER) sD2.1
Contract Terms
Order Rules sED.1
Credit History sD1.2, sD2.2, sD3.1



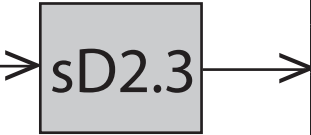
Outputs
Location of Customers sED.7
Purchase History sED.3
Contract Status sED.3
Credit History sD1.2, sD2.2, sD3.1
Optional Payment
Booked Order sD2.3, sED.3
Customer Address Data sED.3
Customer Order Size, Weight, and Freight Class sED.6
Shipping Preferences (Customer) sED.3
Actual Sales History sP5.1

Reserve Inventory and Determine Delivery Date

Inventory and/or planned capacity is identified and reserved for specific orders, and a delivery date is committed and scheduled.

Performance Attributes	Metric
Supply Chain Reliability	% of Orders Delivered In Full, Delivery Performance to Customer Commit Date
Supply Chain Responsiveness	Order Fulfillment Dwell Time, Reserve Resources and Determine Delivery Date Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Reserve Resources & Determine Delivery Date
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Dynamic Deployment Based on Constraint Based Planning and Optimal Scheduling	Advanced planning and scheduling logic with constraint, cost, and resource optimization
Available-to-Promise (ATP)	Available-to-Promise (ATP) provides an availability and feasibility check concerning a customer request or a customer order.
Include environmental costs	Include environmental costs in inventory carrying costs
Automatic Reservation of Inventory and Dynamic Sourcing of Product for Single Shipment to Customer	Integrated order management system that treats each order line as a separate order with integration to inventory source and status; Real-time inventory management
Establish spill controls	Establish spill controls for finished goods inventory storage

Inputs
Delivery Plans sP4.4
Production Plans sP3.4
Sourcing Plans sP2.4
Booked Order sD2.2
Inventory Availability sS1.4, sS2.4, sS3.6, sM1.2, sM2.2, sM3.3, sD1.8, sD4.2
Production Schedule sM1.1, sM2.1, sM2.2, sM3.2



Outputs
Delivery Date sD1.4, sD2.4
Order Signal sP2.1, sP3.1
Order Backlog sP1.1, sP4.1
Inventory Status
Customer Order sD3.4, sED.2
Replenishment Signal sS1.1, sS1.4, sS2.1, sS2.4, sS3.3, sS3.6
Available to Promise Date
Inventory Availability/Delivery Date sP4.2

Consolidate Orders

The process of analyzing orders to determine the groupings that result in least cost/best service fulfillment and transportation.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Consolidate Orders Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Consolidate Orders
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Consolidate Orders by Customer, Source, Traffic Lane, Carrier, Etc.	Integrated load planning and building with warehouse management
Consolidate to minimize energy consumption	Consolidate to minimize fuel/energy consumption



Build Loads

Transportation modes are selected and efficient loads are built.

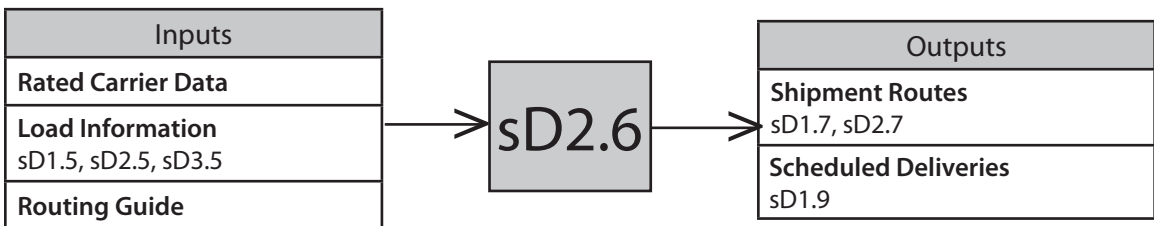
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Build Loads Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Build Loads, Quantity per shipment
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Select carriers with EMS	Select carriers that have adopted an EMS or otherwise demonstrated environmental commitment
CRP & VMI Loads Optimized for Utilization	Integration with CRP/VMI vendor systems
Consolidation of Inbound and Outbound Requirements	Integrated inbound/outbound transportation planning
Build Load in Stop Sequence	Integrated inbound/outbound transportation planning (i.e. 1st truck destination loaded last, etc.).



Route Shipments

Loads are consolidated and routed by mode, lane, and location.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Route Shipments Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Route Shipments, Energy Costs
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Consolidation of Carriers	Transportation modeling and rate analysis
Shipment Tracking and Tracing	Satellite communications, GPS, RFID
Route to minimize fuel consumption	Route to minimize fuel consumption
CRP/VMI	Integrated Load Building; Routing & Scheduling with Advanced Ship Notice (ASN)



Select Carriers and Rate Shipments

Specific carriers are selected by lowest cost per route and shipments are rated and tendered.

Performance Attributes	Metric
Supply Chain Reliability	% of suppliers meeting environmental metrics/criteria
Supply Chain Responsiveness	Select Carriers & Rate Shipments Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Select Carriers & Rate Shipments
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Select Carriers by Least Cost per Shipment and Rate Using Actual Rates Prior to Release to Billing	Rules based carrier selection and actual rate database
Select carriers with EMS	Select carriers that have adopted an EMS or otherwise demonstrated environmental commitment



Receive Product from Source or Make

The activities such as receiving product, verifying, recording product receipt, determining put-away location, putting away and recording location for goods received from either Make or Source. May include quality inspection.

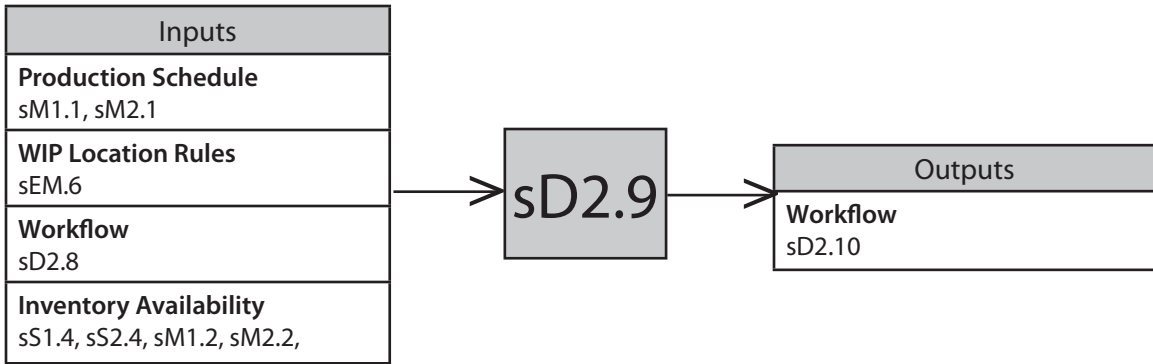
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Receive Product from Source or Make Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Product from Source or Make
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Download P.O. & Advanced Ship Notices for Automated Receiving and Put Away	Integration with Procurement Systems & Electronic Commerce with Vendors
Dynamic Location Assignment Including Lot Control, Zoned Picking, Quality Assurance	Real time inventory control, stock locator, and rules based picking logic
Automatic Identification	Bar Coding & Radio Frequency Communications
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.



Pick Product

The series of activities including retrieving orders to pick, verifying inventory availability, building the pick wave, picking the product, recording the pick and delivering product to packing area in response to an order.

Performance Attributes	Metric
Supply Chain Reliability	% correct material documentation
Supply Chain Responsiveness	Pick Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Pick Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Use of Speed Racks for Automated Material Handling	None identified
Dynamic Simulation of Picking Requirements Optimized for Labor, Cost, and Time	Rules based picking logic and simulation
Dynamic Location Assignment Including Lot Control, Zoned Picking, Quality Assurance	Real time inventory control, stock locator, and rules based picking logic



sD2.10

Pack Product

The activities such as sorting / combining the products, packing / kitting the products, paste labels, barcodes etc. and delivering the products to the shipping area for loading.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Pack Product Cycle Times
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Pack Product
Supply Chain Asset Management	None Identified

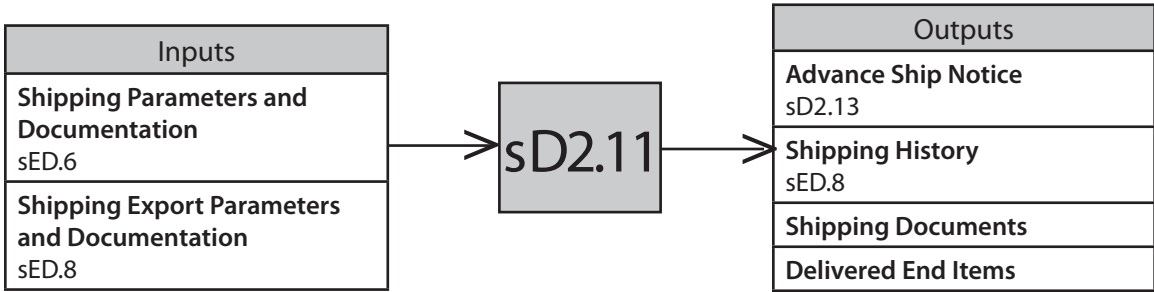


Load Product & Generate Shipping Docs

The series of tasks including placing/loading product onto modes of transportation, and generating the documentation necessary to meet internal, customer, carrier and government needs. Shipping documentation includes the invoice. Optionally verify customer credit.

Performance Attributes	Metric
Supply Chain Reliability	Delivery Performance to Customer Commit Date, Documentation Accuracy
Supply Chain Responsiveness	Load Product & Generate Shipping Documentation Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Load Product & Generate Shipping Documentation
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Advanced Shipping Notices & UCC128 Container Labeling	Bar coding; EDI; integrated transportation/warehouse management
Integrated Credit Checking	Interface to supplier's shipping system to financials
Electronic Generation and Download of Shipping Documents	None identified
Carrier Agreement	Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions.
Full Visibility of Credit History by Shipping Personnel	None identified
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.

sD2.11



Ship Product

The process of shipping the product to the customer site.

Performance Attributes	Metric
Supply Chain Reliability	Delivery Performance to Customer Commit Date, % of Orders Delivered In Full
Supply Chain Responsiveness	Ship Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Ship Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Shipment Tracking	None identified
Retrieve packaging after installation	Retrieve packaging after installation for reuse
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.



sD2.13

Receive and Verify Product by Customer

The process of receiving the shipment at the customer (either at customer site or at shipping area in case of self-collection) and verifying that the order was shipped complete and that the product meets delivery terms.

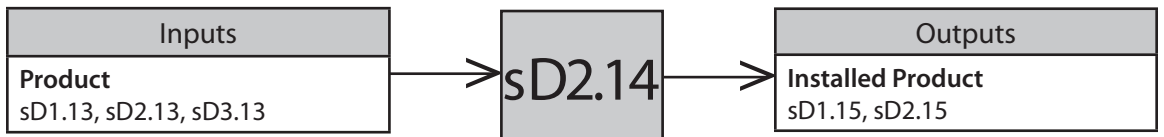
Performance Attributes	Metric
Supply Chain Reliability	Perfect Condition, Delivery Performance to Customer Commit Date
Supply Chain Responsiveness	Receive & Verify Product by Customer Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive & Verify Product by Customer
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Shipment Tracking	None identified
Advanced Shipping Notices & UCC128 Container Labeling	Bar coding; EDI; integrated transportation/warehouse management



Install Product

When necessary, the process of preparing, testing and installing the product at the customer site. The product is fully functional upon completion.

Performance Attributes	Metric
Supply Chain Reliability	Perfect Condition, % Of Faultless Installations
Supply Chain Responsiveness	Install Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Install Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Joint Service Agreements to Document Acceptable Service Levels in Terms of Installation Costs, Installation Cycle Time, Etc.	Collaborative planning tools with the Source suppliers. (This would be effective between customer and supplier, and between internal functions such as Field Service, Manufacturing, Marketing and Order Management)

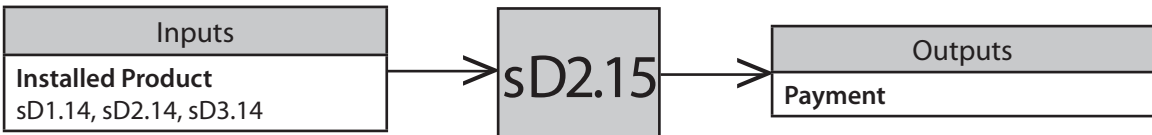


sD2.15

Invoice

A signal is sent to the financial organization that the order has been shipped and that the billing process should begin and payment be received or be closed out if payment has already been received. Payment is received from the customer within the payment terms of the invoice.

Performance Attributes	Metric
Supply Chain Reliability	Documentation Accuracy, % of Faultless Invoices
Supply Chain Responsiveness	Deliver Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Customer Invoicing/ Accounting Costs
Supply Chain Asset Management	Days Sales Outstanding
Best Practices	Description/Definition
Provide Visibility to and Quickly Escalate Delinquent Accounts for Resolution	Integrated accounts receivables
Electronic Transfer of Shipment Information to Finance	None identified

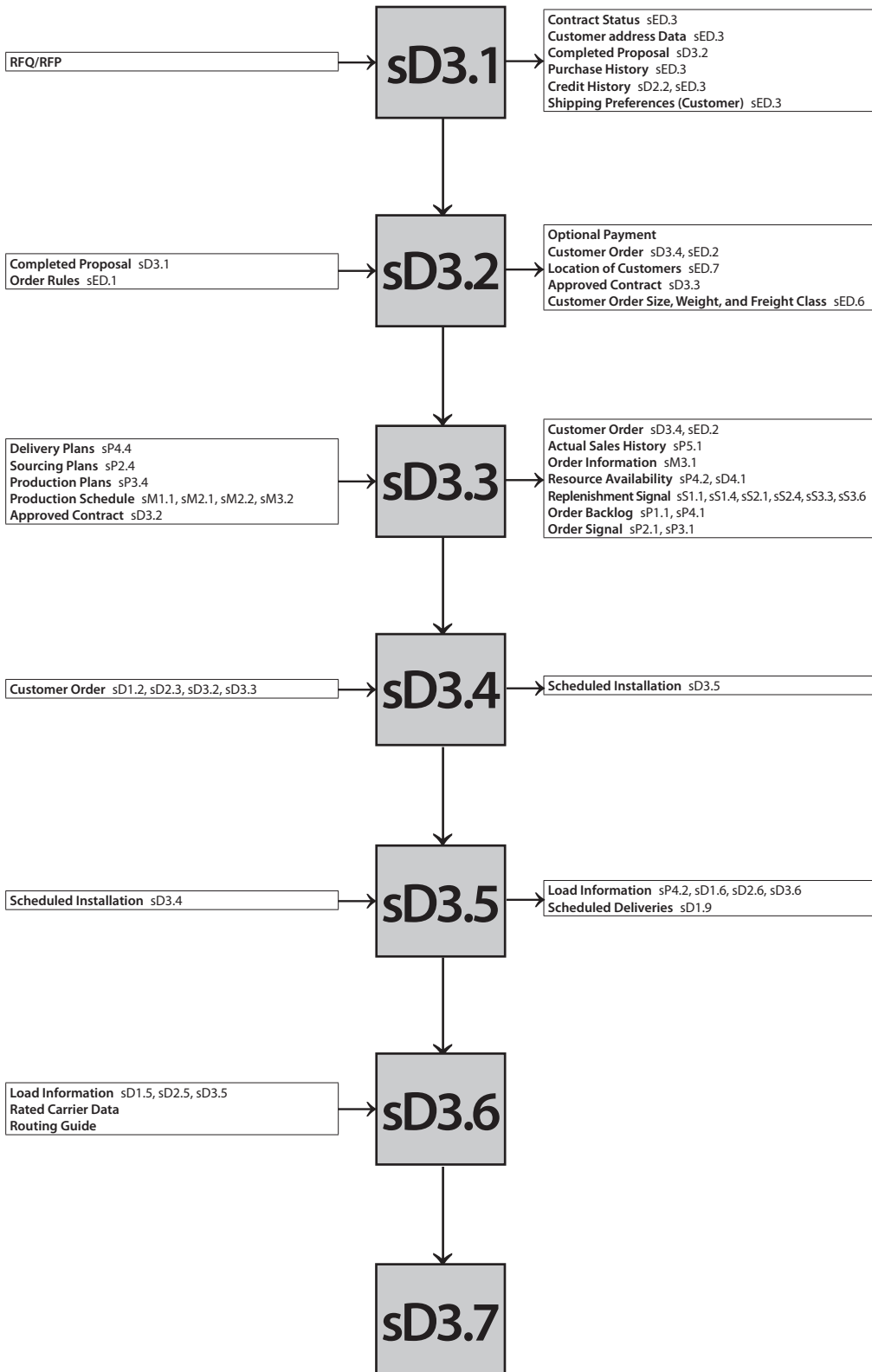


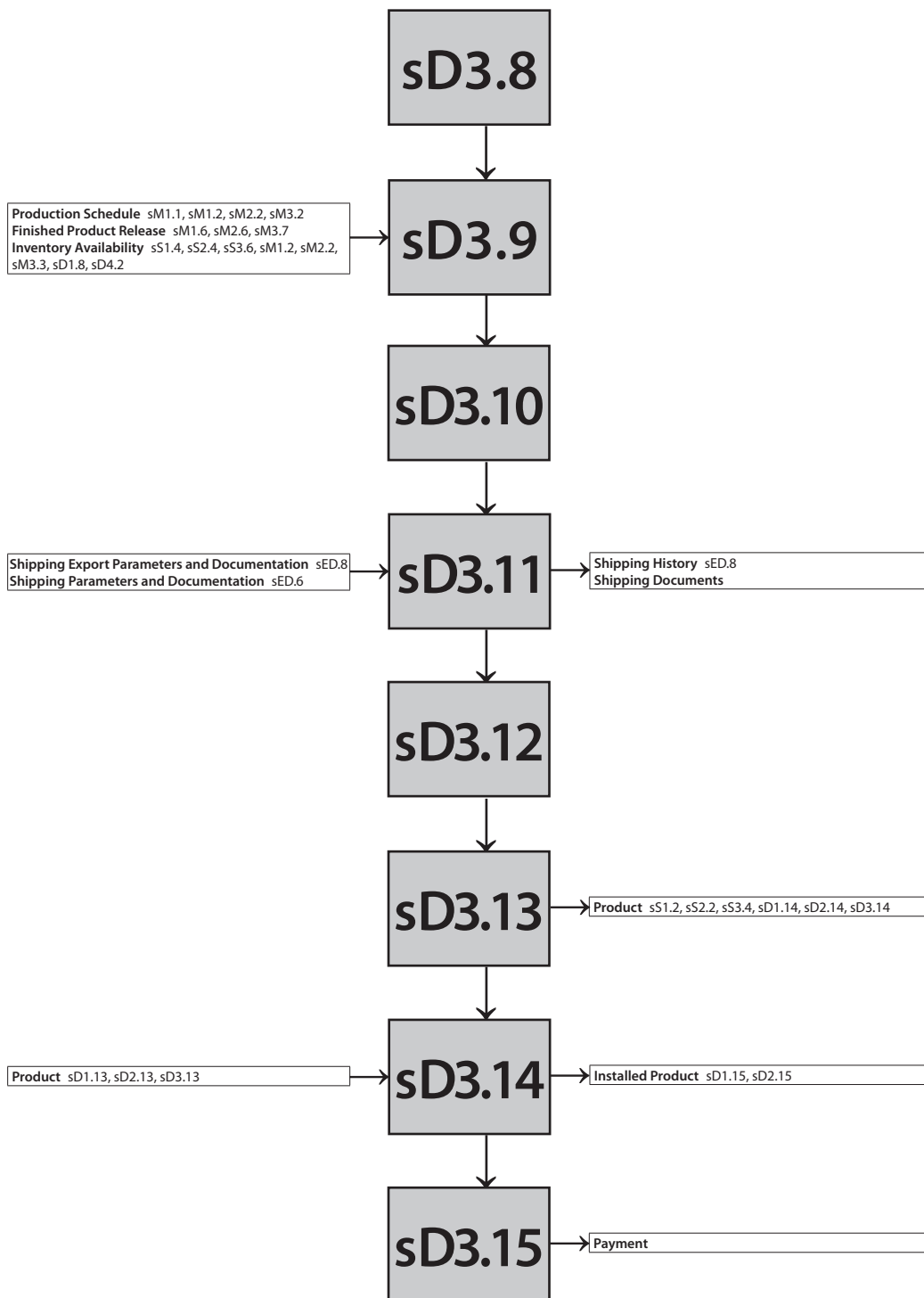
Deliver Engineer-to-Order Products

The process of obtaining, responding to, and allocating resources for a customer order that has unique requirements or specifications and delivering a product that is partially or fully designed, redesigned, manufactured, and/or assembled from a bill of materials or recipe that includes one or more custom parts or ingredients. Design will begin only after the receipt and validation of a firm customer order.

Performance Attributes	Metric
Supply Chain Reliability	Perfect Order Fulfillment
Supply Chain Responsiveness	Deliver Cycle Time, Order Fulfillment Cycle Time
Supply Chain Agility	Upside Deliver Flexibility, Downside Deliver Adaptability, Upside Deliver Adaptability
Supply Chain Costs	Cost to Deliver, Energy Costs, Order Management Costs, Finished Goods Inventory Days of Supply
Supply Chain Asset Management	Return on Working Capital, Cash-To-Cash Cycle Time, Return on Supply Chain Fixed Assets

sD3



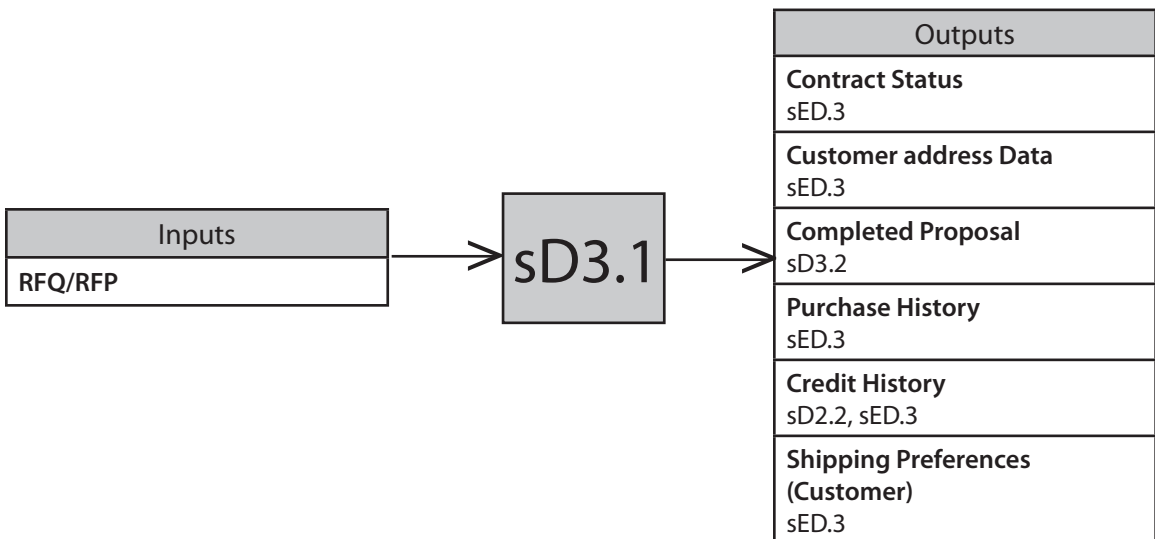


sD3.1

Obtain & Respond to RFP/RFQ

The process of receiving a request for proposal or request for quote, evaluating the request (estimating the schedule, developing costs estimates, establishing price), and responding to the potential customer.

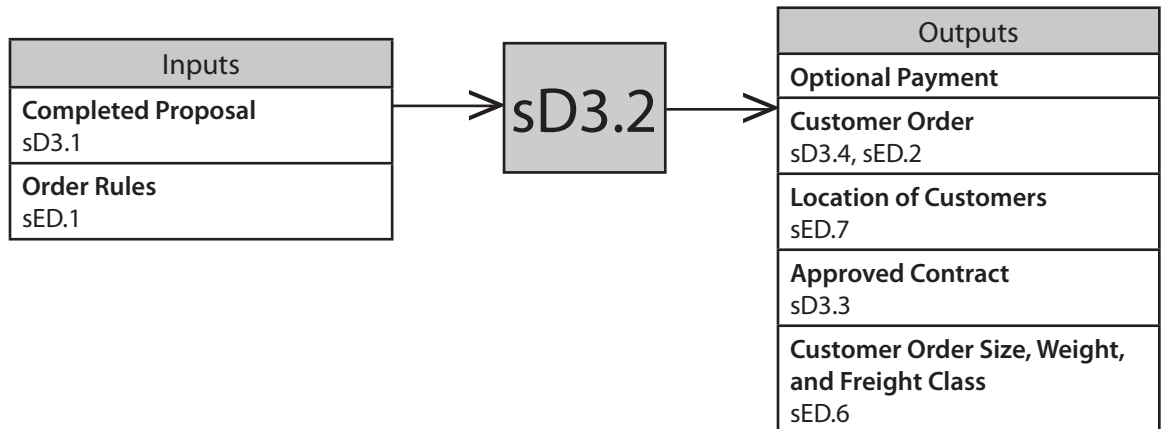
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Obtain & Respond to Request for Quote (RFQ) / Request for Proposal (RFP) Cycle Ti
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Obtain & Respond to Request for Quote (RFQ) / Request for Proposal (RFP)
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Partnership with Outside Design Firms to Provide Skills and Capacity, as Needed	None identified
Use of CAD/CAE Applications to Simulate Design, Cost and Manufacturing Process	None identified



Negotiate and Receive Contract

The process of negotiating order details with customer (e.g.: price, schedule, product performance) and finalizing the contract. Optionally accept payment.

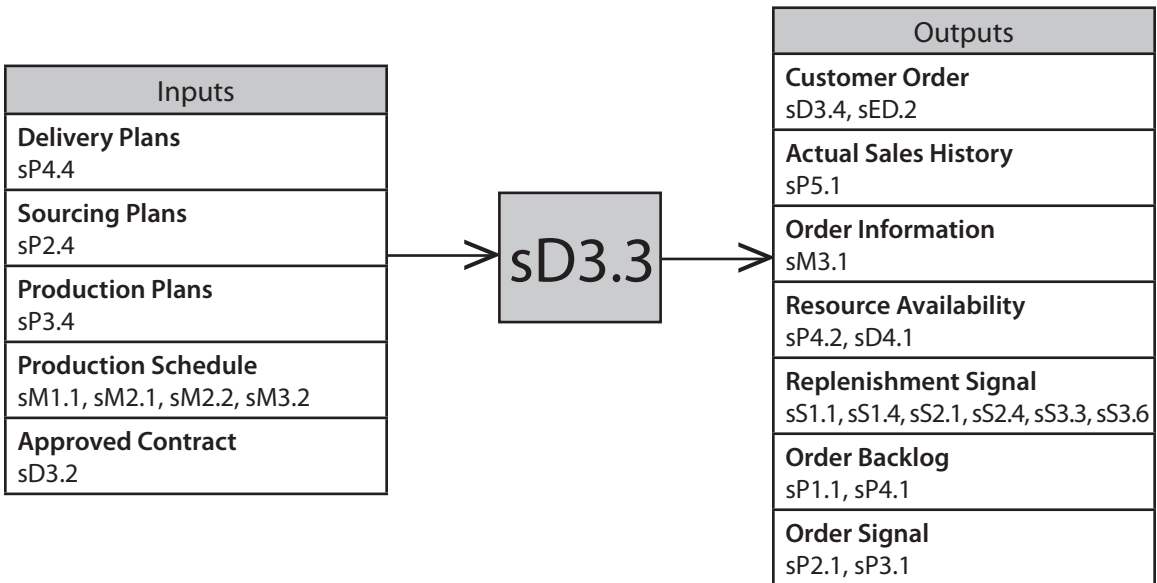
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Negotiate & Receive Contract Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Negotiate & Receive Contract
Supply Chain Asset Management	None Identified



Enter Order, Commit Resources & Launch Program

The process of entering/finalizing the customers order, approving the planned resources (e.g., engineering, manufacturing, etc.) and officially launching the program.

Performance Attributes	Metric
Supply Chain Reliability	Delivery Performance to Customer Commit Date, % of Orders Delivered In Full
Supply Chain Responsiveness	Enter Order, Commit Resources & Launch Program Cycle Time, Order Fulfillment Dwell Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Enter Order, Commit Resources & Launch Program
Supply Chain Asset Management	None Identified



Schedule Installation

The process of evaluating the design and build schedules relative to customer requested installation date to determine installation schedule.

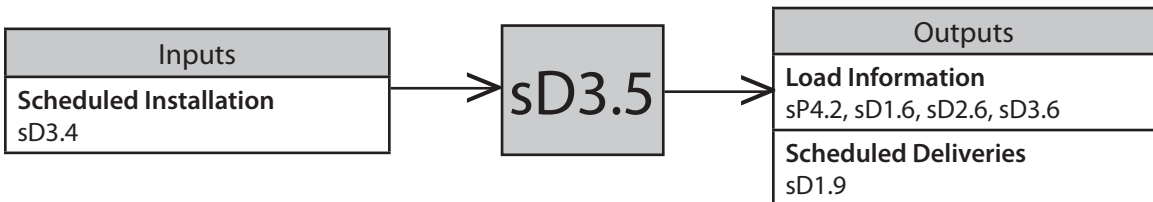
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Schedule Installation Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Schedule Installation
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Schedule to maximize transportation capacity	Schedule to maximize transportation capacity



Build Loads

Transportation modes are selected and efficient loads are built.

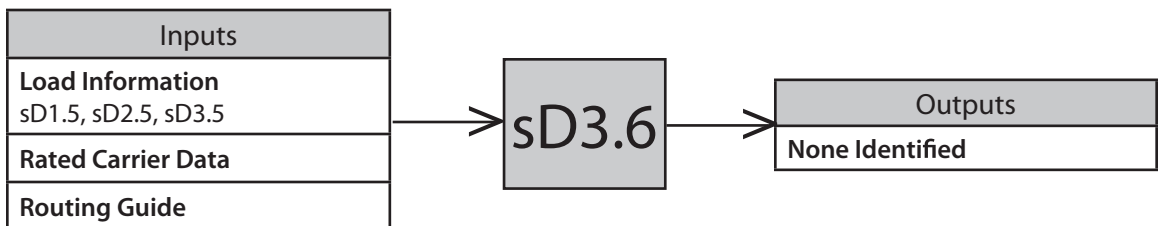
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Build Loads Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Build Loads
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Consolidation of Inbound and Outbound Requirements	Integrated inbound/outbound transportation planning
CRP & VMI Loads Optimized for Utilization	Integration with CRP/VMI vendor systems
Vendor Managed Inventory	VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.
Build Load in Stop Sequence	Integrated inbound/outbound transportation planning (i.e. 1st truck destination loaded last, etc.).
Consolidate to minimize energy consumption	Consolidate to minimize fuel/energy consumption



Route Shipments

Loads are consolidated and routed by mode, lane, and location.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Route Shipments Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Route Shipments
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Consolidation of Carriers	Transportation modeling and rate analysis
CRP/VMI	Integrated Load Building; Routing & Scheduling with Advanced Ship Notice (ASN)
Shipment Tracking and Tracing	Satellite communications, GPS, RFID
Select carriers with EMS	Select carriers that have adopted an EMS or otherwise demonstrated environmental commitment
Select Carriers by Least Cost per Shipment and Rate Using Actual Rates Prior to Release to Billing	Rules based carrier selection and actual rate database
Carrier/Route Optimization Based on Continuous Movement and Consolidation/Pooling	Route scheduling, carrier selection, and rating



Select Carriers & Rate Shipments

Specific carriers are selected by lowest cost per route and shipments are rated and tendered.

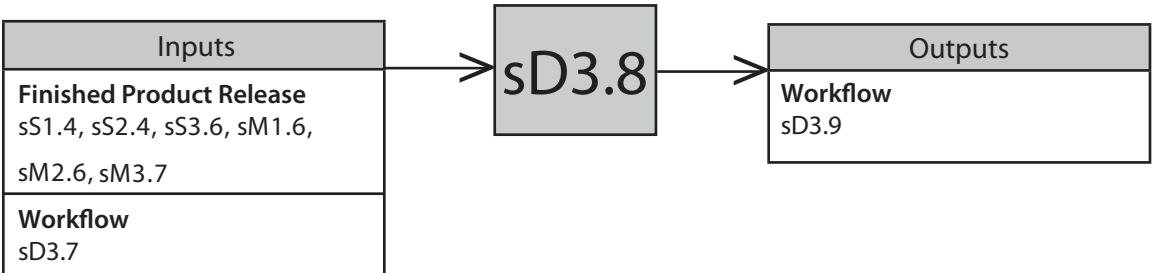
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Select Carriers & Rate Shipments Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Select Carriers & Rate Shipments
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Select Carriers by Least Cost per Shipment and Rate Using Actual Rates Prior to Release to Billing	Rules based carrier selection and actual rate database



Receive Product from Source or Make

The activities such as receiving product, verifying, recording product receipt, determining put-away location, putting away and recording location for goods received from either Make or Source. May include quality inspection.

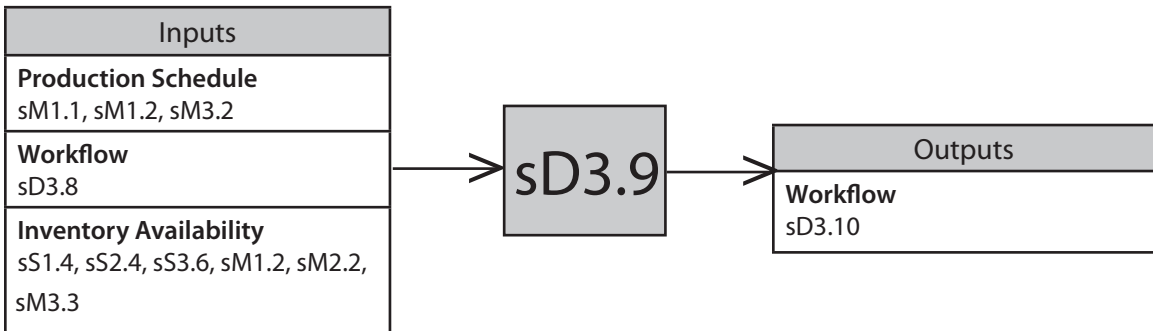
Performance Attributes	Metric
Supply Chain Reliability	% correct material documentation
Supply Chain Responsiveness	Receive Product from Source or Make Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Product from Source or Make
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Automatic Identification	Bar Coding & Radio Frequency Communications
Dynamic Location Assignment Including Lot Control, Zoned Picking, Quality Assurance	Real time inventory control, stock locator, and rules based picking logic
Download P.O. & Advanced Ship Notices for Automated Receiving and Put Away	Integration with Procurement Systems & Electronic Commerce with Vendors
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.



Pick Product

The series of activities including retrieving orders to pick, verifying inventory availability, building the pick wave, picking the product, recording the pick and delivering product to packing area in response to an order.

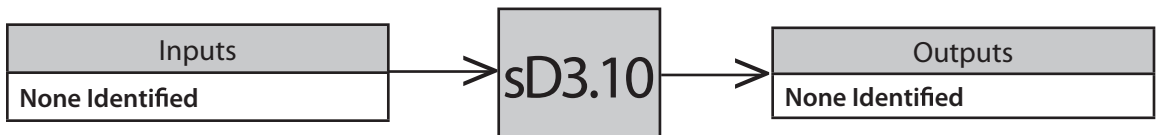
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Pick Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Pick Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Dynamic Location Assignment Including Lot Control, Zoned Picking, Quality Assurance	Real time inventory control, stock locator, and rules based picking logic
Dynamic Simulation of Picking Requirements Optimized for Labor, Cost, and Time	Rules based picking logic and simulation



Pack Product

The activities such as sorting / combining the products, packing / kitting the products, paste labels, barcodes etc. and delivering the products to the shipping area for loading.

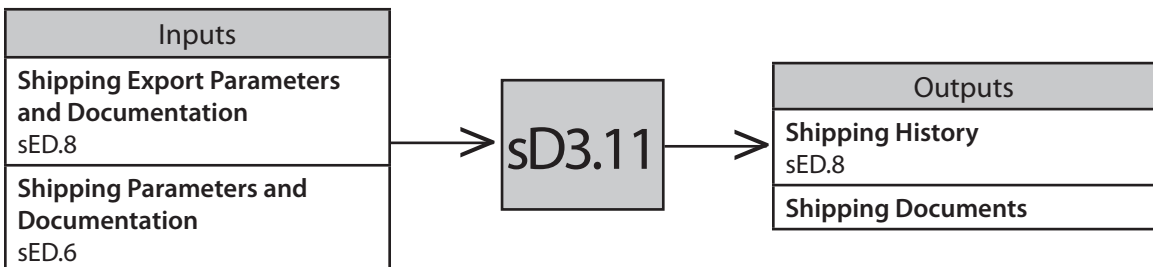
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Pack Product Cycle Times
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Pack Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Retrieve packaging after installation	Retrieve packaging after installation for reuse



Load Product & Generate Shipping Docs

The series of tasks including placing/loading product onto modes of transportation, and generating the documentation necessary to meet internal, customer, carrier and government needs. Shipping documentation includes the invoice. Optionally verify customer credit.

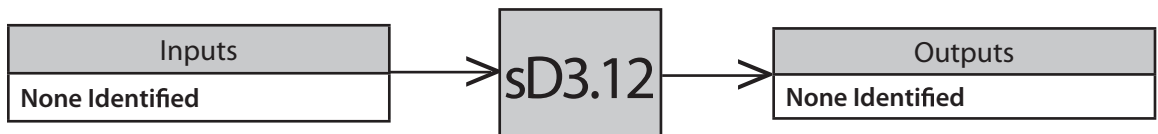
Performance Attributes	Metric
Supply Chain Reliability	Documentation Accuracy
Supply Chain Responsiveness	Load Product & Generate Shipping Documentation Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Load Product & Generate Shipping Documentation
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Integrated Credit Checking	Interface to supplier's shipping system to financials
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.
Electronic Generation and Download of Shipping Documents	None identified
Full Visibility of Credit History by Shipping Personnel	None identified
Carrier Agreement	Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions.
Advanced Shipping Notices & UCC128 Container Labeling	Bar coding; EDI; integrated transportation/warehouse management



Ship Product

The process of shipping the product to the customer site.

Performance Attributes	Metric
Supply Chain Reliability	% of Orders Delivered In Full, Delivery Performance to Customer Commit Date
Supply Chain Responsiveness	Ship Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Ship Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Cross-Docking	Used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.
Shipment Tracking	None identified



Receive and Verify Product by Customer

The process of receiving the shipment (either at customer site or at shipping area in case of self-collection) and verifying that the order was shipped complete and that the product meets delivery terms.

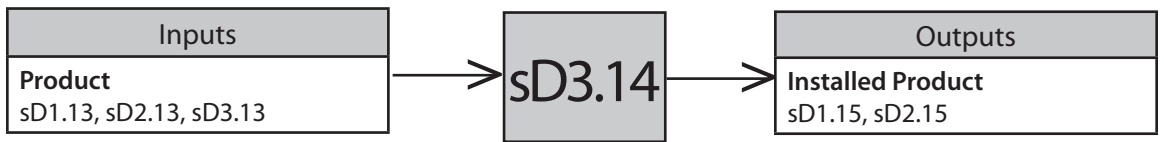
Performance Attributes	Metric
Supply Chain Reliability	Delivery Performance to Customer Commit Date, % of Orders Delivered In Full, Perfect Condition
Supply Chain Responsiveness	Receive & Verify Product by Customer Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive & Verify Product by Customer
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Shipment Tracking	None identified
Advanced Shipping Notices & UCC128 Container Labeling	Bar coding; EDI; integrated transportation/warehouse management



Install Product

The process of preparing, testing and installing the product at the customer site. The product is fully functional upon completion.

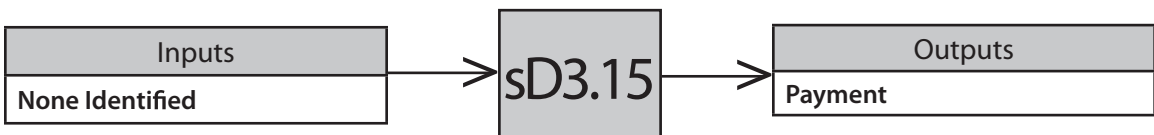
Performance Attributes	Metric
Supply Chain Reliability	Perfect Condition
Supply Chain Responsiveness	Install Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Install Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
None Identified	None identified



Invoice

A signal is sent to the financial organization that the order has been shipped and that the billing process should begin and payment be received or be closed out if payment has already been received. Payment is received from the customer within the payment terms of the invoice.

Performance Attributes	Metric
Supply Chain Reliability	% of Faultless Invoices, Documentation Accuracy
Supply Chain Responsiveness	Invoice Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Invoice
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Utilize EDI and EFT for Payment to Speed Closing of Receivables and to Reduce Processing Costs	EDI transaction and network services
Electronic Transfer of Shipment Information to Finance	None identified
Provide Visibility to and Quickly Escalate Delinquent Accounts for Resolution	Integrated accounts receivables

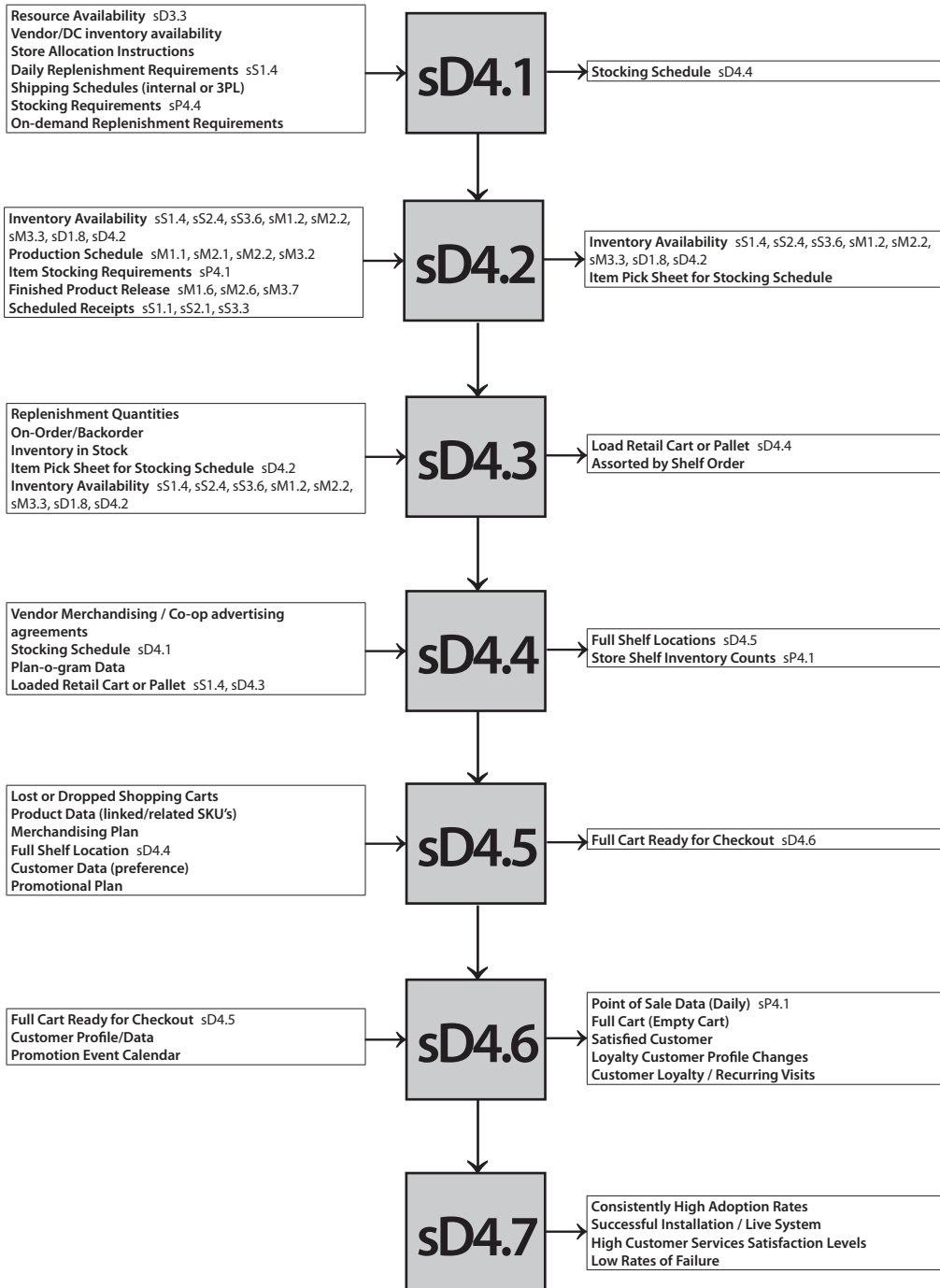


Deliver Retail Product

Deliver Retail Products are the processes used to acquire, merchandise, and sell finished goods at a retail store. A retail store is a physical location that sells products (and services) direct to the consumer using a point of sale process (manual or automated) to collect payment. Merchandising at a store level is the stocking and restocking of products in designated storage locations to generate sales in a retail store.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Deliver Cycle Time, Order Fulfillment Cycle Time
Supply Chain Agility	Downside Deliver Adaptability, Upside Deliver Adaptability, Upside Deliver Flexibility
Supply Chain Costs	Cost to Deliver
Supply Chain Asset Management	Cash-To-Cash Cycle Time, Return on Supply Chain Fixed Assets, Return on Working Capital
Best Practices	Description/Definition
None Identified	None identified

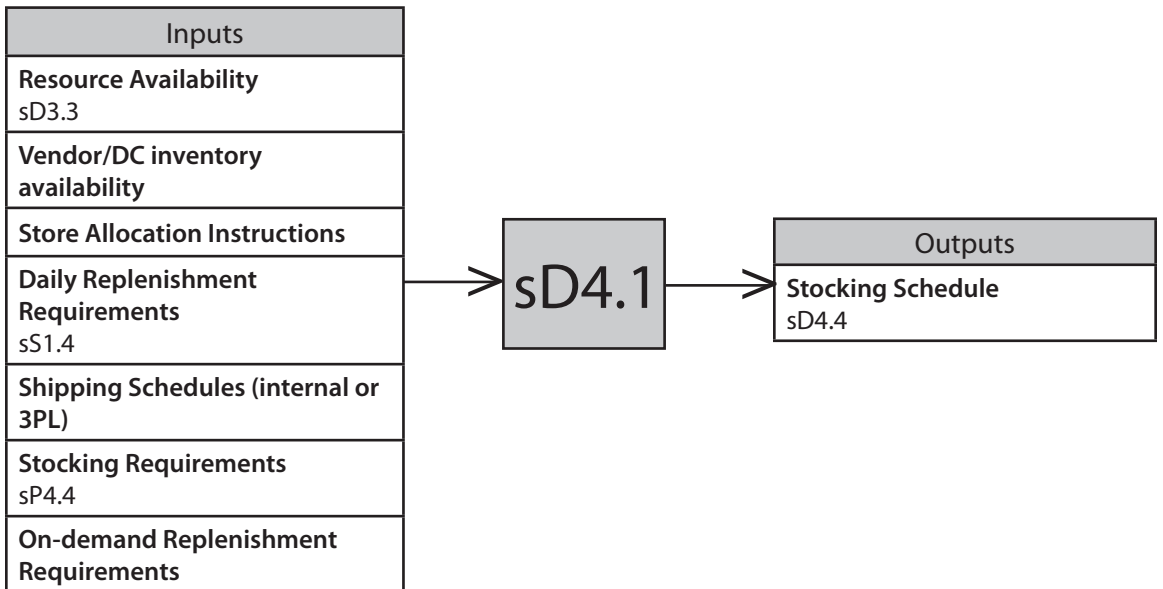
sD4



Generate Stocking Schedule

The process of scheduling resources to support item-stocking requirements.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Generate Stocking Schedule Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Generate Stocking Schedule
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Automated Pick List	System generated pick-lists based on picking / batching rules.
Labor Scheduling that Matches Product Flow	Workforce management solution with flexible rules.
Push Product on Trailer Arrival	System prioritization of items coming off trucks vs. picked from back room.

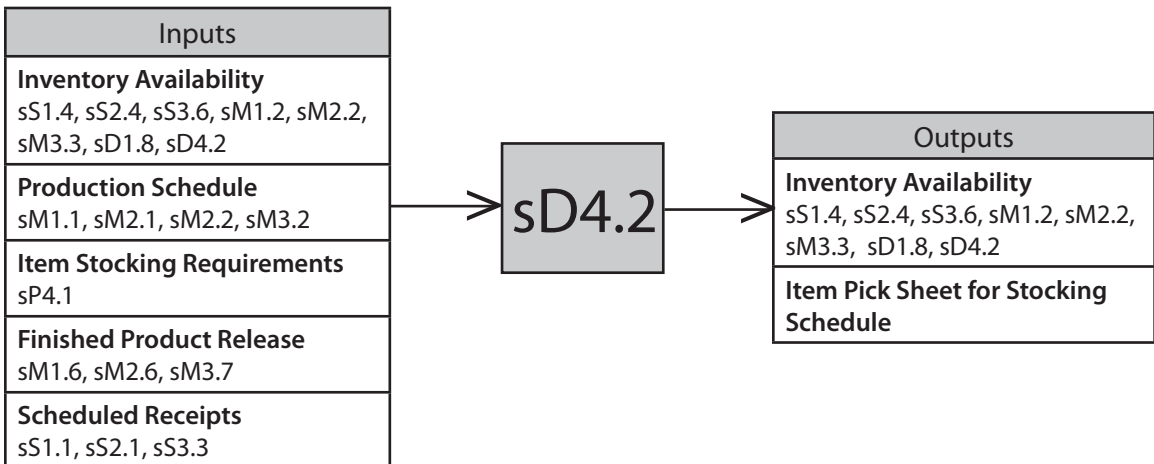


sD4.2

Receive Product at the Store

The activities such as receiving product, verifying, recording product receipt, determining put-away location, putting away and recording location that a company performs at its own stores. May include quality inspection.

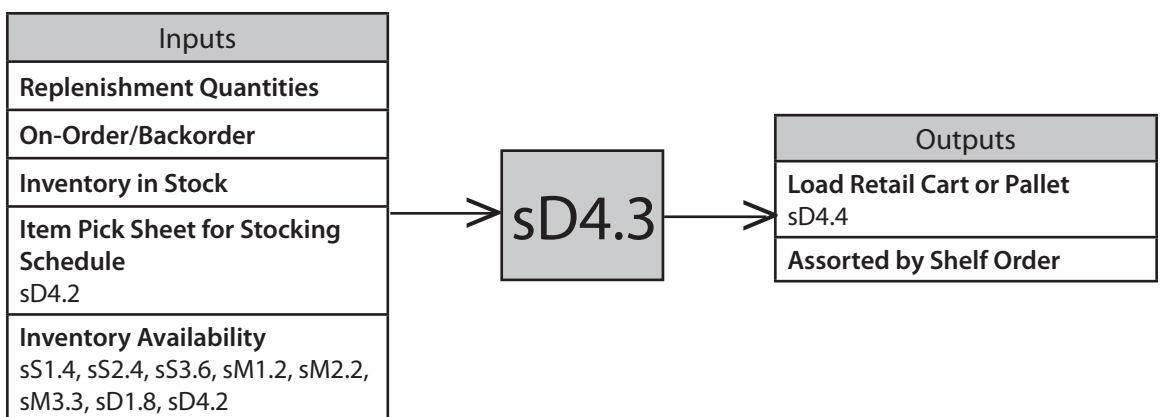
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Receive Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Product at Store
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Push Product on Trailer Arrival	System prioritization of items coming off trucks vs. picked from back room.
Automated Pick List	System generated pick-lists based on picking / batching rules.
Labor Scheduling that Matches Product Flow	Workforce management solution with flexible rules.



Pick Product from Backroom

The process of retrieving restocking orders to pick, determining inventory availability, building a pick wave, picking item and quantity from a designated backroom warehouse location, recording the resulting inventory transaction, and delivering the product to point of stock.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Pick Product from Backroom Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Pick Product from Backroom
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Staging Based on In-store Zones	Items are staged for re-stocking based on zones within the store. This minimizes restocking effort.
Automated Directed Picking	A pick list displayed on a handheld device that directs picks and relieves inventory from backroom locations
Automated Replenishment of Back Stock Based on Minimum Stocking Levels	None identified
Defined Stocking Levels and Criteria	None identified

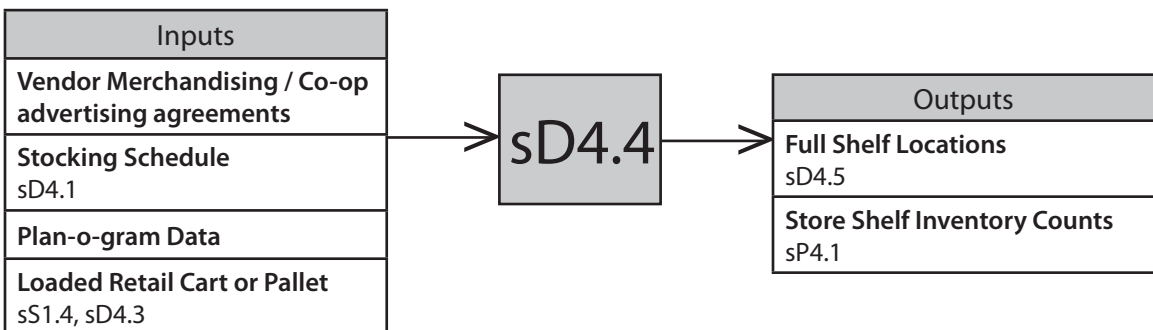


sD4.4

Stock Shelf

For restocks, the tasks associated with identifying the item location, stocking the shelf according to merchandise plans, and recording the appropriate inventory transaction. For promotional items and stock repositioning the tasks associated with shelf and point of sale preparation, stock placement, and end of sale activities.

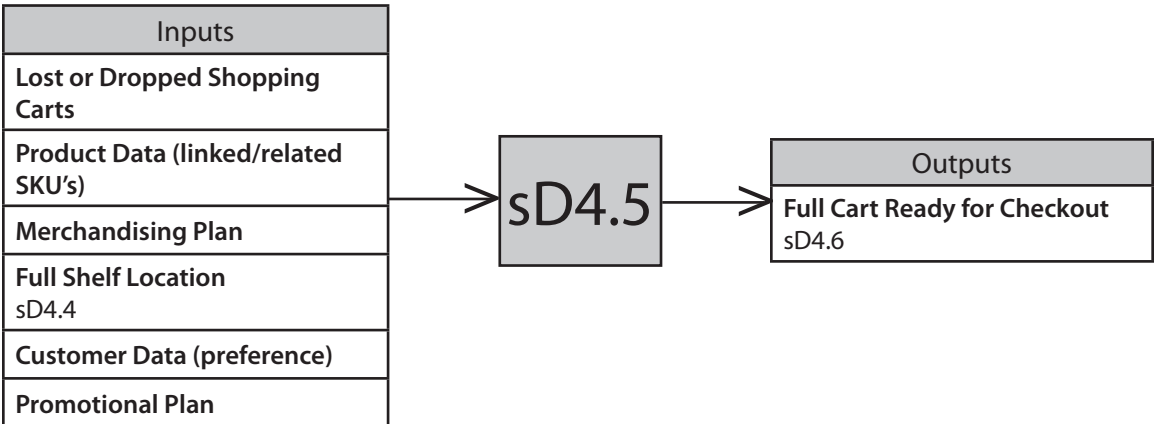
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Stock Shelf Cycle Time, In-stock %
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Stock Shelf
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Proof of Performance (Promotion Management)	Scan store shelves / bar codes to confirm put-a-way. Scan using handheld and match with ad.
Scan Displays for Promotion Conformance	None identified
Off Peak Stocking	The majority of stocking is completed with minimal impact to or visibility from the customer.
Stocking is Completed in Zones	Each area of the store has its own stocking plan and items are routed specifically to that area.
Item/Shelf Scanning Upon Put-A-Way	Scan store shelves / bar codes to confirm put-a-way.



Fill Shopping Cart

Typical set of tasks associated with product selection, storage and movement through to checkout.

Performance Attributes	Metric
Supply Chain Reliability	% Item Location Accuracy
Supply Chain Responsiveness	Fill Shopping Cart Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Fill Shopping Cart
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Multiple Locations Throughout Store	Planned and tracked via a plan-o-gram system;Location specific product labeling.
Up and Cross Selling and/or Substitution	Trained staff or automated systems (Internet) that recommend up-sell, cross-sell, and/or substitution.
Items Are Relieved from Inventory When Item is Removed from Shelf	RFID, smart cart or customer self-service reduces system inventory upon item pick.
Substitution	Trained staff or automated systems (Internet) that recommend up-sell, cross-sell, and/or substitution.See Up and cross selling
Measured and Compared with Same Activity Previous Period	DSS or portal tool that shows previous period performance and comparison for store management (whether it is a year ago, period ago, etc.).
Loyalty Card Data	Use for comparison to previous sales activity/track new consumers, etc.

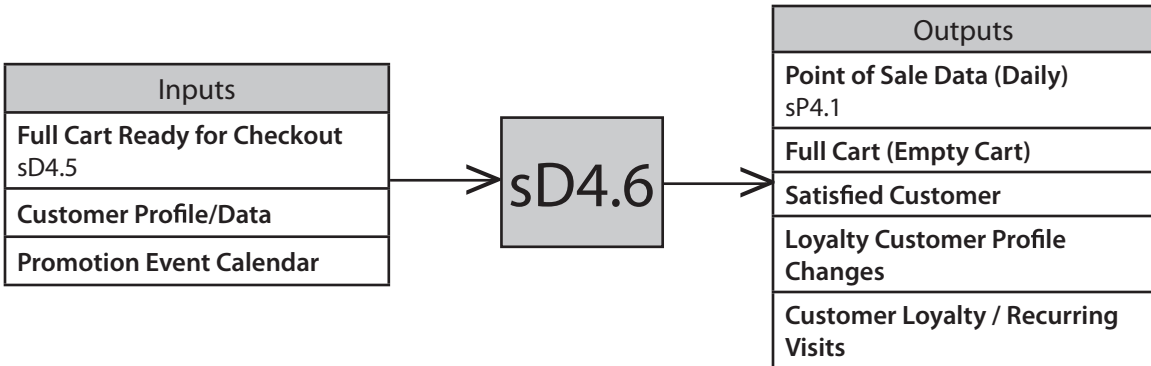


sD4.6

Checkout

The processes and tasks associated with product checkout including scanning, method of payment, credit application and approval, service agreement, order confirmation, and/or invoice or receipt.

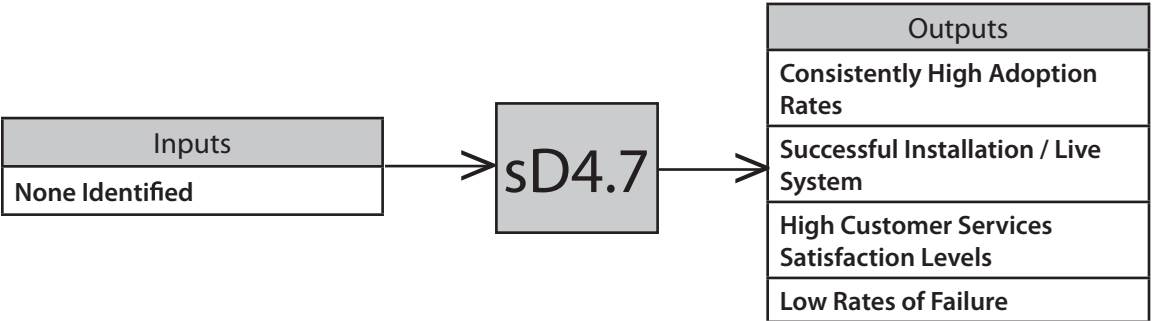
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Checkout Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Checkout
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Notification of Existing/Future Event or Promotions	None identified
Customer Profile Drive Recognition Upon Checkout	None identified
Automatic Customer Payment	RFID, smart cart or customer self-service charges goods to card upon store departure.



Deliver and/or Install

The process of preparing and installing the product at the customer site. The product is fully functional upon completion.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Deliver and/or Install Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Deliver and/or Install
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Provide Product or Service Training to Employees or FAQ's Online	None identified
Goals / Performance Plans	None identified
Measurement, Monitoring and Adjustment of Service or Product Installation	None identified
Stage Product or Service Adoption	None identified

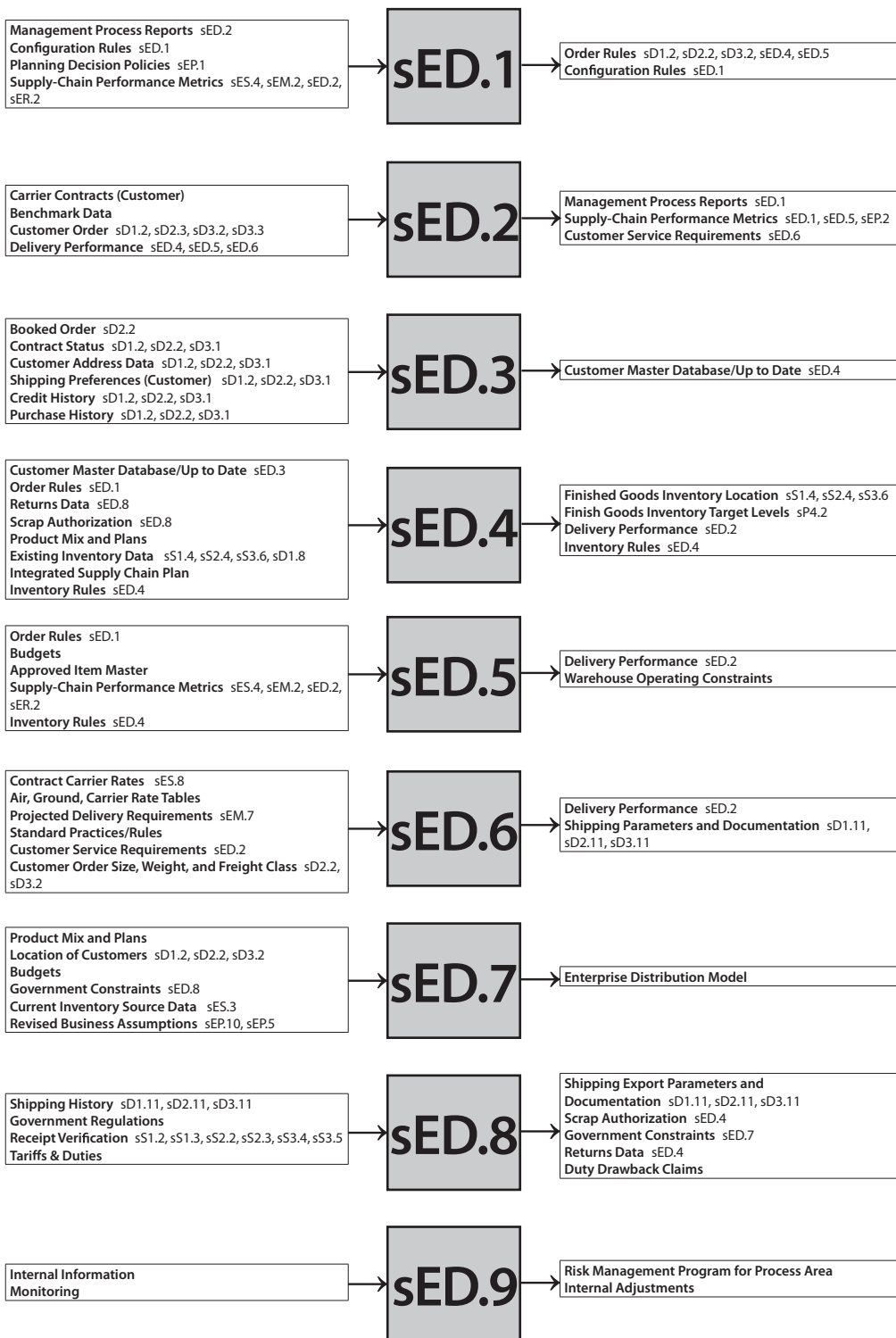


Enable Deliver

The collection of processes associated with managing and monitoring Deliver process data, performance and relationships.

Process Categories

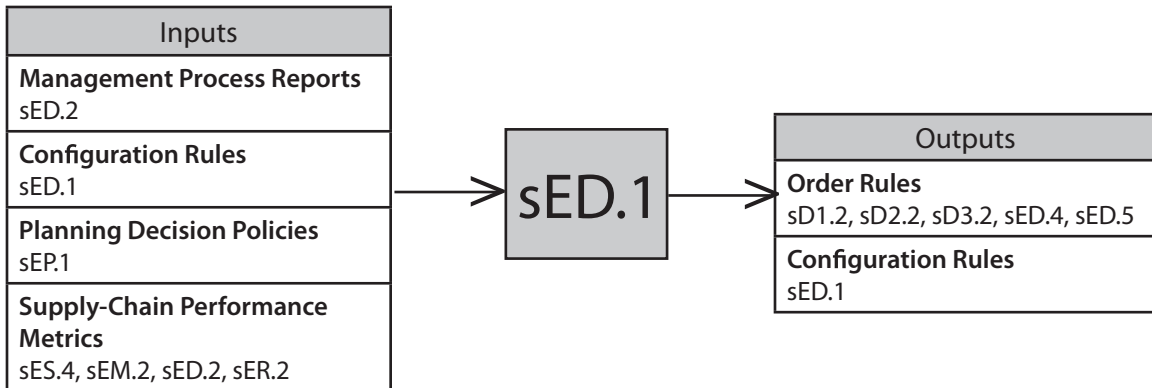
sED.1: Manage Deliver Business Rules	The process of defining and maintaining rules which affect the acceptance of an order, based on quantity, method of delivery, credit, customer experience, etc. (Include distribution channel rules)
sED.2: Assess Delivery Performance	The process of defining the requirement and monitoring the performance of the delivery of product to a customer. When physical delivery is out-sourced the performance is passed on to source for contract administration.
sED.3: Manage Deliver Information	The process of collecting, maintaining, and communicating information to support deliver planning and execution processes. The information to be managed includes: order data - (customer preference, history, status, and delivery requirements, etc.), warehouse data, transportation data, and deliver data.
sED.4: Manage Finished Goods Inventories	The process of establishing and maintaining finished goods, inventory limits or levels, replenishment models, ownership, product mix, stocking locations
sED.5: Manage Deliver Capital Assets	Acquisition, maintenance, and disposition of order management, warehouse and transportation capital assets. Determine material handling (inventory) pick pack & ship methods (inventory), and equipment.
sED.6: Manage Transportation	The process of 1) defining and maintaining the information which characterizes product, containerization, vehicle, route, terminals, regulations, rates/tariffs and backhaul opportunity (Characterization include information necessary to support maintenance of internal Outbound Transportation equipment - CAPITAL ASSETS) and 2) the management of transporters.
sED.7: Manage Product Life Cycle	The process of defining and maintaining the distribution channel/ network for a specific product line (no capital asset or transportation management).
sED.8: Manage Import/Export Requirements	The process of recording and maintaining regulations and rates, which constrain the ordering and delivering of product
sED.9: Manage Supply Chain Deliver Risk	The process of managing Deliver risks within an overall Supply Chain Risk Program. This includes identifying and assessing Deliver risks as well as and planning and implementing responses to Deliver risks. Delivery risks include all potential events that could impact company's ability to deliver on-time at a reasonable cost and quality. In particular, the risk areas addressed are Transportation (weather related transportation issues, ocean freight...), Inventory management (accuracy, stock-out, damaged inventory...), Order management (fulfillment accuracy, delayed delivery...), and Document compliance (invoicing issue, customs procedures...).



Manage Deliver Business Rules

The process of defining and maintaining rules which affect the acceptance of an order, based on quantity, method of delivery, credit, customer experience, etc. (Include distribution channel rules)

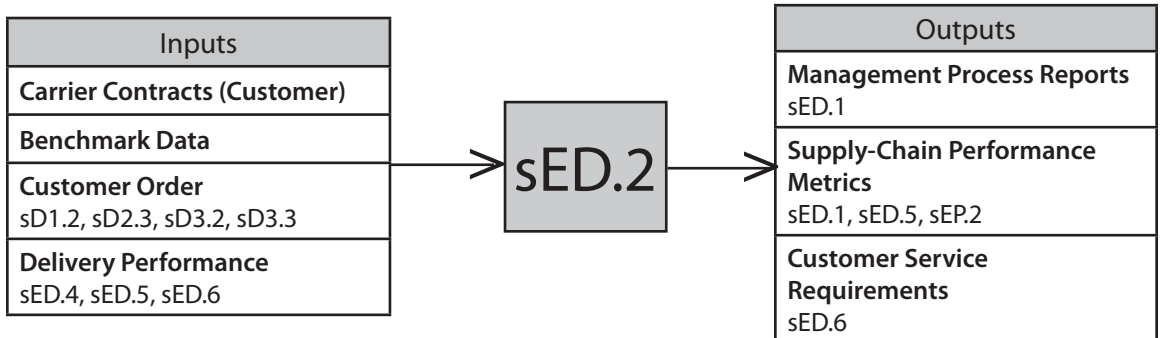
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Deliver Business Rules Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Deliver Business Rules
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Integrated Edit at Order Entry Time	Customer Master Record
On-Line Rule Base	None identified
Include environmental requirements	Include environmental requirements in deliver rules



Assess Delivery Performance

The process of defining the requirement and monitoring the performance of the delivery of product to a customer. When physical delivery is out-sourced the performance is passed on to source for contract administration.

Performance Attributes	Metric
Supply Chain Reliability	Documentation Accuracy, Perfect Condition
Supply Chain Responsiveness	Assess Delivery Performance Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Assess Delivery Performance
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Real Time Package Tracking	Tracking and tracing
Customer Initiated Package Tracking	WEB based Shared systems



Manage Deliver Information

The process of collecting, maintaining, and communicating information to support deliver planning and execution processes. The information to be managed includes: order data - (customer preference, history, status, and delivery requirements, etc.), warehouse data, transportation data, and deliver data.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Deliver Information Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Deliver Information
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Provide Single Source of Information on the Customer (Single Group / Owner Responsible for Accuracy / Quality of Customer Data)	Secure E-Commerce Server and integrated Order Management System (OMS) Warehouse Management System (WMS) and Transportation Management System (TMS)
Online Real-Time Customer Entry and Edit	On-line Customer Service Module CRM (Customer resource Management) software is getting a big push in the E-Commerce/E-Business areas and generally provides a means to fulfill this requirement
Customer Service Data Validation Including Geo-Coding	None identified
Comprehensive History of Customer Interactions Including Order History, Claims, Problems, Etc.	None identified
Customer Access to Online Tracking of Order Status and Shipping Information	Internet-enabled package/shipment tracking

Inputs
Booked Order sD2.2
Contract Status sD1.2, sD2.2, sD3.1
Customer Address Data sD1.2, sD2.2, sD3.1
Shipping Preferences (Customer) sD1.2, sD2.2, sD3.1
Credit History sD1.2, sD2.2, sD3.1
Purchase History sD1.2, sD2.2, sD3.1



Outputs
Customer Master Database/Up to Date sED.4

Manage Finished Goods Inventories

The process of establishing and maintaining finished goods, inventory limits or levels, replenishment models, ownership, product mix, stocking locations

Performance Attributes	Metric
Supply Chain Reliability	% of Orders Delivered In Full
Supply Chain Responsiveness	Manage Finished Goods Inventories Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Finished Goods Inventory Days of Supply, Cost to Manage Finished Goods Inventories
Supply Chain Asset Management	Inventory Days of Supply , % of hazardous material in inventory
Best Practices	Description/Definition
Real Time Data on Current Status	Dynamic calculation of safety stock based on actual sales.
Statistical Test Count	The Statistical Test Count (STC) process is a method of validating inventory on-hand values by physically counting and reconciling a statistical sample of the entire inventory population. This sample is then extrapolated across the inventory population, which provides an indicative measure of entire inventory population. Furthermore, with extrapolation the net and gross percentage of error is determined.
Manage hazardous inventory	Manage hazardous inventory
Spill control	Spill control
Periodic Review of Metrics and Strategy with Comparisons to Industry Benchmarks	Real time view of data.

Inputs
Customer Master Database/Up to Date sED.3
Order Rules sED.1
Returns Data sED.8
Scrap Authorization sED.8
Product Mix and Plans
Existing Inventory Data sS1.4, sS2.4, sS3.6, sD1.8
Integrated Supply Chain Plan
Inventory Rules sED.4

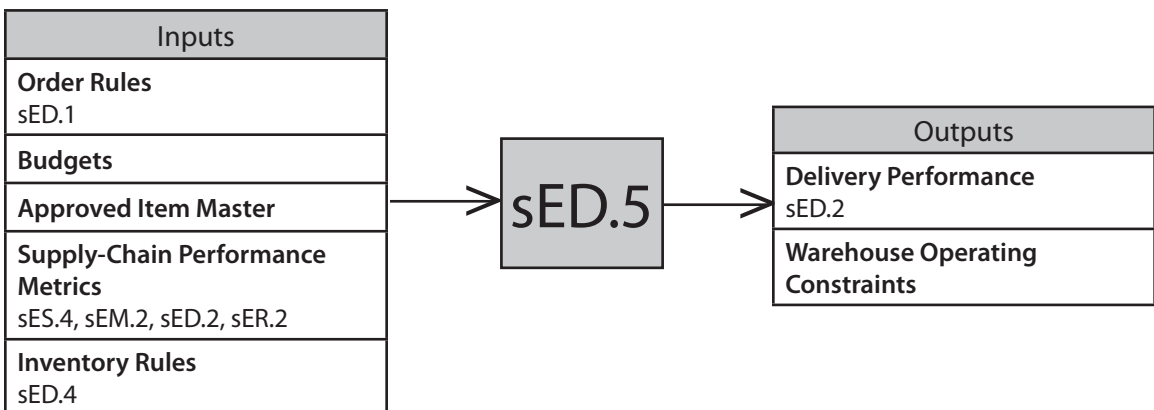


Outputs
Finished Goods Inventory Location sS1.4, sS2.4, sS3.6
Finish Goods Inventory Target Levels sP4.2
Delivery Performance sED.2
Inventory Rules sED.4

Manage Deliver Capital Assets

Acquisition, maintenance, and disposition of order management, warehouse and transportation capital assets. Determine material handling (inventory) pick pack & ship methods (inventory), and equipment.

Performance Attributes	Metric
Supply Chain Reliability	Reportable Release Incidents
Supply Chain Responsiveness	Manage Deliver Capital Assets Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Deliver Capital Assets
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Measure Customer Service	Advanced Shipping Notices (ASN) Parcel and Container Routing and Rating Compliance Labeling Real time shipment tracking
Standard Operating Procedures and Methodology	None identified
Storage Location Zoning	Automated or Optimized Slotting (Storage Location) Systems
Facility Master Plan	Automated Item Cubing and Weighting systems
Automated Data Entry	Scanning with RFID/Bar-codes systems
Removal of Obsolete Stock	Automated Calculation of ABC Velocity Movement



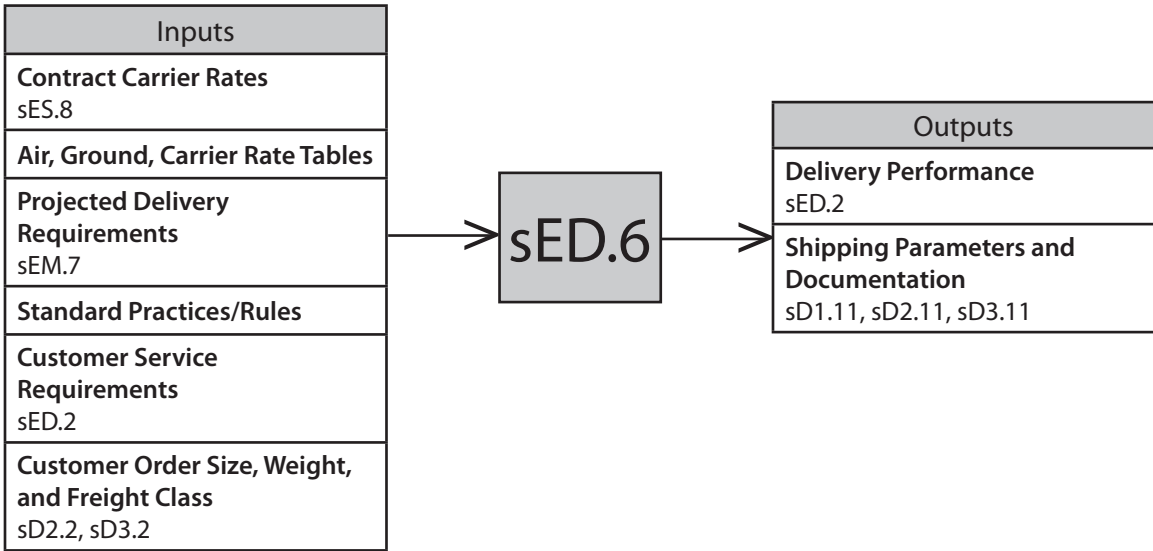
Manage Transportation

The process of 1) defining and maintaining the information which characterizes product, containerization, vehicle, route, terminals, regulations, rates/tariffs and backhaul opportunity (Characterization include information necessary to support maintenance of internal Outbound Transportation equipment - CAPITAL ASSETS) and 2) the management of transporters.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Transportation Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	% of vehicle fuel derived from alternative fuels, Cost to Manage Transportation
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Rating & Routing	Internet Pooling (Electronic brokerage of shipments)
Integrated Order Management, Warehouse Management, and Transportation Management Systems View for analysis for all orders and shipments the following data: Logistics, Product, Cost, GL Charging	Transportation Management System (TMS) Maintenance Management
Real-Time Shipment Tracking, (via internet)	Transportation Management System (TMS) Maintenance Management
Backhaul Trading Exchange	Pooling
View for Analysis for All Orders and Shipments the Following Data: Logistics, Product, Cost, GL Charging	Transportation Management System (TMS) Maintenance Management
Manage Information Across 100% of Shipments	Transportation Management System (TMS) Maintenance Management
Appointment Scheduling for Pickup and Delivery of Customer Shipments	Transportation Management System (TMS) Maintenance Management
Electronic Manifest and Electronic Billing	Transportation Management System (TMS) Maintenance Management
Automated Documentation for International Shipments	Transportation Management System (TMS) Maintenance Management
Real-Time Optimized Shipment Method Selection (Air Parcel, Ground Parcel, LTL, etc.) Based on Customer Service Requirements	Transportation Management System (TMS) Maintenance Management

sED.6

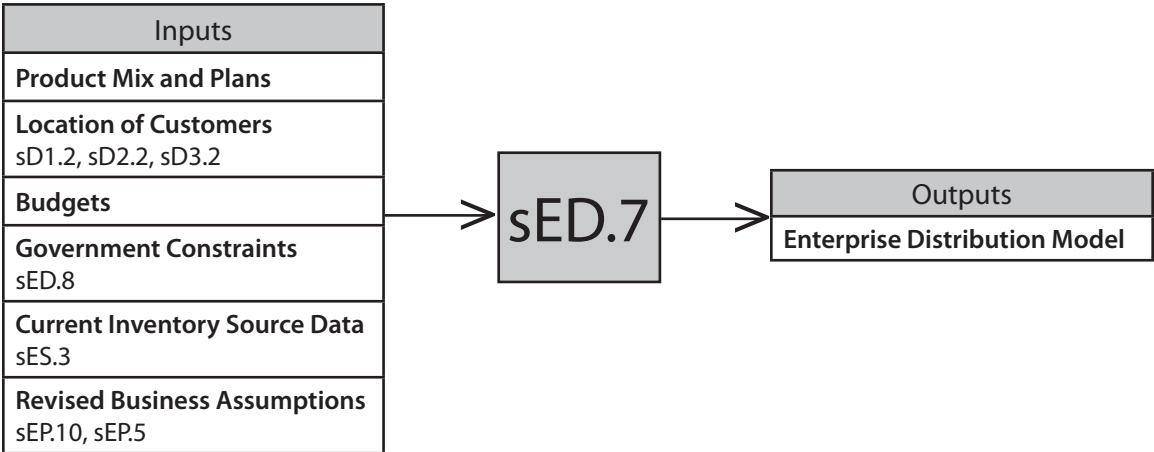
Best Practices cont.	Description/Definition cont.
Measurement of Carrier Performance for On-time Delivery and Completeness	Transportation Management System (TMS) Maintenance Management
Capture and Maintain Mode Specific Data	Transportation Management System (TMS) Maintenance Management



Manage Product Life Cycle

The process of defining and maintaining the distribution channel/ network for a specific product line (no capital asset or transportation management).

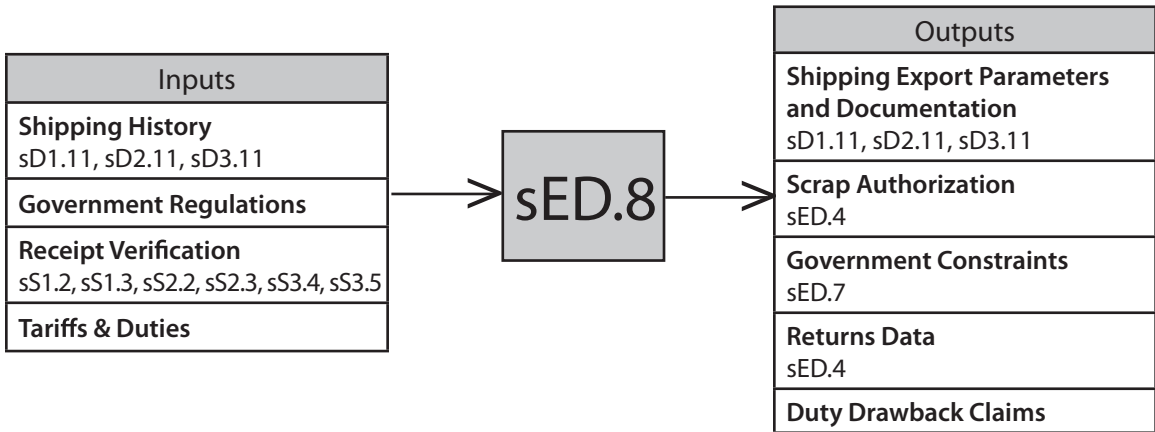
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Product Life Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Product Life Cycle
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Take-back program	Take-back program at end of product life
Integrated Facility Management	None identified
Operations and Network Analysis	None identified
Standard Operating Procedures and Methodology	None identified
Plan for proper product disposal	Plan for proper product disposal



Manage Import/Export Requirements

The process of recording and maintaining regulations and rates, which constrain the ordering and delivering of product.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Customs Clearance Cycle Time, Manage Import/Export Requirements Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Import/Export Requirements
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Multi-country Export/Import documentation compliance	None identified
Assessing Export/Import Requirements during Time of Product Development/Manufacture	Multi-country Export/Import documentation compliance
Documents Generated Automatically During Shipment Preparation.	Electronic documentation submission via EDI and/or internet.
Manage foreign environmental requirements	Manage foreign environmental requirements
Direct Connection to Customs Clearance	Electronic documentation submission via EDI and/or internet.
Ability to Track Component/ Sub-Component Manufacturing Country of Origin	Component/lot tracking (lot trace-ability)
Direct Transfer of Documents to Recipient and Forwarder	Electronic documentation submission via EDI and/or internet.



Manage Supply Chain Deliver Risk

The process of managing Deliver risks within an overall Supply Chain Risk Program. This includes identifying and assessing Deliver risks as well as and planning and implementing responses to Deliver risks. Delivery risks include all potential events that could impact company's ability to deliver on-time at a reasonable cost and quality. In particular, the risk areas addressed are Transportation (weather related transportation issues, ocean freight...), Inventory management (accuracy, stock-out, damaged inventory...), Order management (fulfillment accuracy, delayed delivery...), and Document compliance (invoicing issue, customs procedures...).

Performance Attributes	Metric
Supply Chain Reliability	Value at Risk (Deliver), Age of Product / Customer Risk Data (months), VAR of Supplier Performance, Supplier Mitigation Plans Implemented (percent), VAR of Internal Process Performance, VAR of product/customer performance - , Age of Supplier Risk Data (months)
Supply Chain Responsiveness	External Event Response (average days)
Supply Chain Agility	Industry Benchmark Comparison (%), Options Rating (0-100%), Hedge Rating (Inventory DOS for risk management), Internal Event Response (average days)
Supply Chain Costs	Mitigation cost by Event (\$), Mitigation Cost (\$), Assessment / Risk Management Costs (\$)
Supply Chain Asset Management	Gross Risk (\$), Event Risk (EVAR) (\$), Mitigated Risk (\$), Residual Risk (\$), Supply / Customer / Product Base Rated (%), Individual Process Area Event Rating (EVAR) (\$)

Best Practices	Description/Definition
Supply Chain Business Rules Configured to mitigate risk	<p>This practice involves establishing business rules (e.g., customer priority, supplier priority, production routing, transportation routing, etc.) based on minimizing the risk to the supply chain. Under this practice, business rules are established or configured in response to the corporate risk management plan with a goal of reducing either the likelihood of a disruption occurring or the impact to the supply chain should a disruption occur.</p> <p>Business rule reconfiguration typically includes an assessment of the impact of each rule change on the overall supply chain before actual implementation.</p>

Best Practices cont.	Description/Definition cont.
Supply Chain Risk Identification	A key aspect of supply chain risk management is identification. Identification involves creating a list of potential events that could harm any aspect of the supply chain's performance. Risk identification allows an organization to take steps to create plans to manage risks before they occur. this is typically more cost effective then waiting to react to adverse events when they occur.
Supply Chain Risk Assessment	Supply Chain Risk assessment provides management with an understanding of where the greatest risks may exist in order to prioritize resources for risk mitigation and management. Performing such assessments will involve clarifying the nature of the risk, understanding conditions that may lead to the event, knowing how frequently such events have happened or can be expected to happen, and the potential impact of such events. the team can then prioritize addressing the risks.
Supply Chain Network Configured to Mitigate Risk	<p>This practice relies on a risk evaluation of the supply chain to guide the design of the supply chain network. Node locations, transportation routes, capacity size and location, number of suppliers, number of production locations, etc. are all determined in a fashion that mitigates potential disruptions to the ability to deliver product and service to the end customer.</p> <p>This practice relies on the information collected through risk identification and risk assessment processes to identify nodes that are at a high risk of disruption due to the location of the node. Location specific risks can include tactical strike risks, natural disaster risks, single point of failure risks, etc.</p>
Supply Chain Risk Monitoring	Once areas of risk have been identified, an organization needs to monitor their internal and external environment. This helps them to predict when risky events are becoming more likely. It also helps to identify new risks and is tightly linked to the best practice of Supply Chain Risk Identification.
Supply Chain Information Configured to Minimize Risk	This practice involves managing supply chain information networks to minimize the risk to the supply chain. This includes information sharing with partners as well as internal locations. This helps all parties to be quickly informed of a real or potential disruption and respond quickly and appropriately to minimize the disruption impact.
Crisis Communications Planning	<p>Open communication is necessary for effective risk management, where the term "open" refers to the possibility to directly reach the right person – who can better handle the information about a crisis situations – wherever in the organization.</p> <p>Managers require direct communication channels up, down and across their business units to help identify risks and take appropriate actions.</p>

sED.9

Best Practices cont.

Description/Definition cont.

Supply Chain Risk Management

Supply chain risk management is the systematic identification, assessment and mitigation of potential disruptions in logistics networks with the objective to reduce their negative impact on the logistics network's performance.



Return

The processes associated with moving material from a customer back through the supply chain to address defects in product, ordering, or manufacturing, or to perform upkeep activities.

Process Categories	
sSR1: Source Return Defective Product	The return and disposition determination of defective products as defined by the warranty claims, product recall, non-conforming product and/or other similar policies including appropriate replacement. The Return Defective Product supports any type of product not conforming to specifications (including order non-conformance such as late or otherwise improper delivery); company business rules determine the definition of 'defective'. The physical disposition of the product may not be part of the return process.
sDR1: Deliver Return Defective Product	The receipt and disposition determination of defective products as defined by the warranty claims, product recall, non-conforming product and/or other similar policies including appropriate replacement. The Return Defective Product supports any type of product not conforming to specifications (including order non-conformance such as late or otherwise improper delivery); company business rules determine the definition of 'defective'. The physical disposition of the product may not be part of the return process.
sSR2: Source Return MRO Product	The return of Maintenance, Repair and Overhaul (MRO) products or company assets for the purpose of servicing, repairing or upgrading it, as defined by Maintenance Plans or the occurrence or anticipation of risk of failure. Generally company assets managed through a MRO process are expected to be refurbished to a useable condition and returned to service. The Return process does not represent the actual maintenance, repair or overhaul activities; these are generally represented by Make processes. The physical disposition of the product may not be part of the return process.
sDR2: Deliver Return MRO Product	The receipt of Maintenance, Repair and Overhaul (MRO) products or company assets for the purpose of servicing, repairing or upgrading it, as defined by Maintenance Plans or the occurrence or anticipation of risk of failure. Generally company assets managed through a MRO process are expected to be refurbished to a useable condition and returned to service. The Return process does not represent the actual maintenance, repair or overhaul activities; these are generally represented by Make processes. The physical disposition of the product may not be part of the return process.

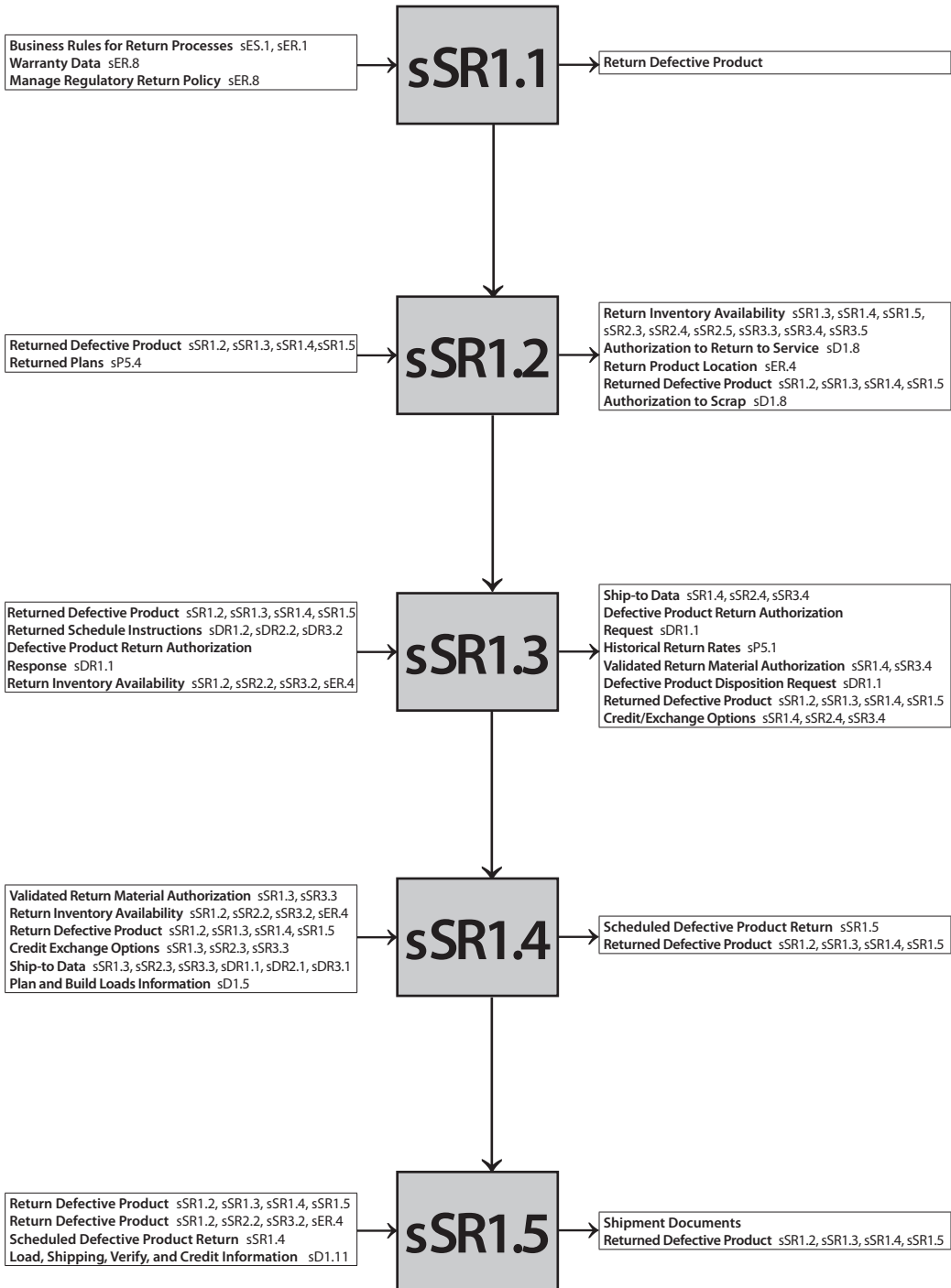
sSR3: Source Return Excess Product	The return of excess or aging inventory or obsolete products as defined by the terms and conditions of a customer/supplier contract. The intention of excess product returns is to reallocate inventory to a location or organization that can sell the product that is considered in excess in the current location. The physical disposition of the product may not be part of the return process.
sDR3: Deliver Return Excess Product	The receipt of excess or aging inventory or obsolete products as defined by the terms and conditions of a customer/supplier contract. The intention of excess product returns is to reallocate inventory to a location or organization that can sell the product that is considered in excess in the current location. The physical disposition of the product may not be part of the return process.
sER: Enable Return	The collection of processes associated with managing and monitoring Return process data, performance and relationships.

Source Return Defective Product

The return and disposition determination of defective products as defined by the warranty claims, product recall, non-conforming product and/or other similar policies including appropriate replacement. The Return Defective Product supports any type of product not conforming to specifications (including order non-conformance such as late or otherwise improper delivery); company business rules determine the definition of 'defective'. The physical disposition of the product may not be part of the return process.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Source Return Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Source Return
Supply Chain Asset Management	Return on Working Capital, Rebuild or recycle rate, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
None Identified	None identified

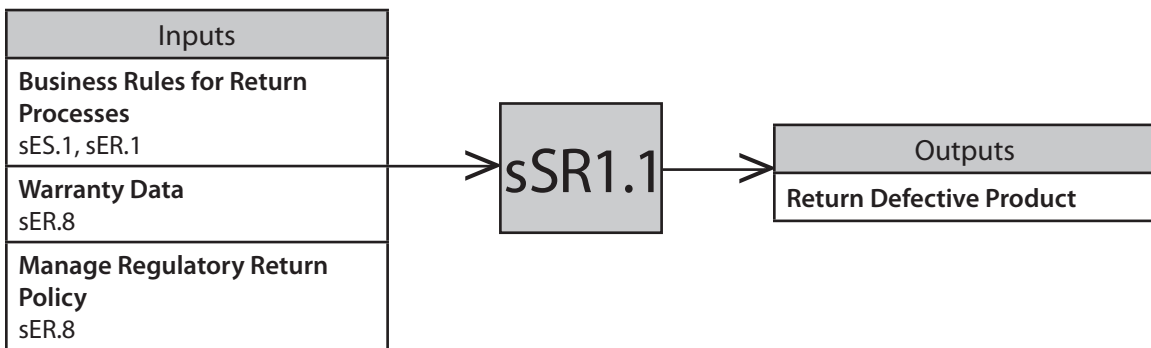
sSR1



Identify Defective Product Condition

The process where the customer utilizes planned policies, business rules and product operating conditions inspection as criteria to identify and confirm that material is excess to requirements defective.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Asset Management	Value of Defective Inventory in Disposition Stage/ Total Inventory Value
Supply Chain Agility	None Identified
Supply Chain Costs	Cost of identifying the defective condition as a % of total Source cost
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Enterprise Level Policies/Rules with Local Execution	Web based access to enterprise level business rules

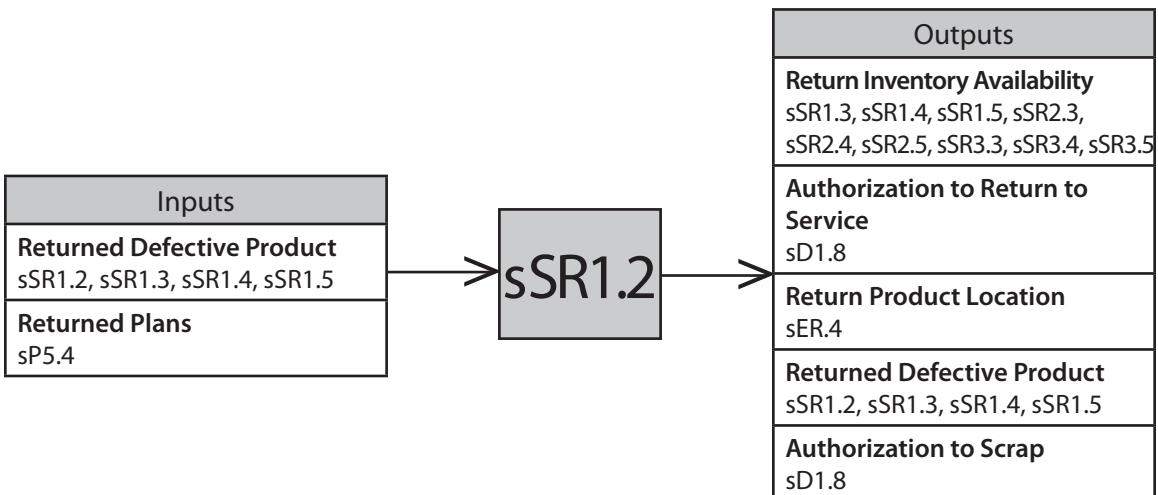


sSR1.2

Disposition Defective Product

The process of the customer determining whether to return the defective item and the appropriate source contact for a return authorization.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Asset Management	Value of Defective Inventory in Disposition Stage/ Total Inventory Value
Supply Chain Agility	None Identified
Supply Chain Costs	Defective product disposition costs as % total Source Return cost
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Confirm Changes in Condition Code Policies Are Promptly Communicated to All Employees and Supply-Chain Partners.	None identified
Confirm Asset Return Condition Codes Are Clearly Understood by All Employees, Especially Those Who Are New to the Process	None identified
Drive Returns Directly to Return Stock Point of Disposition to Reduce Cost and Cycle Time	Specify return disposition location and time.

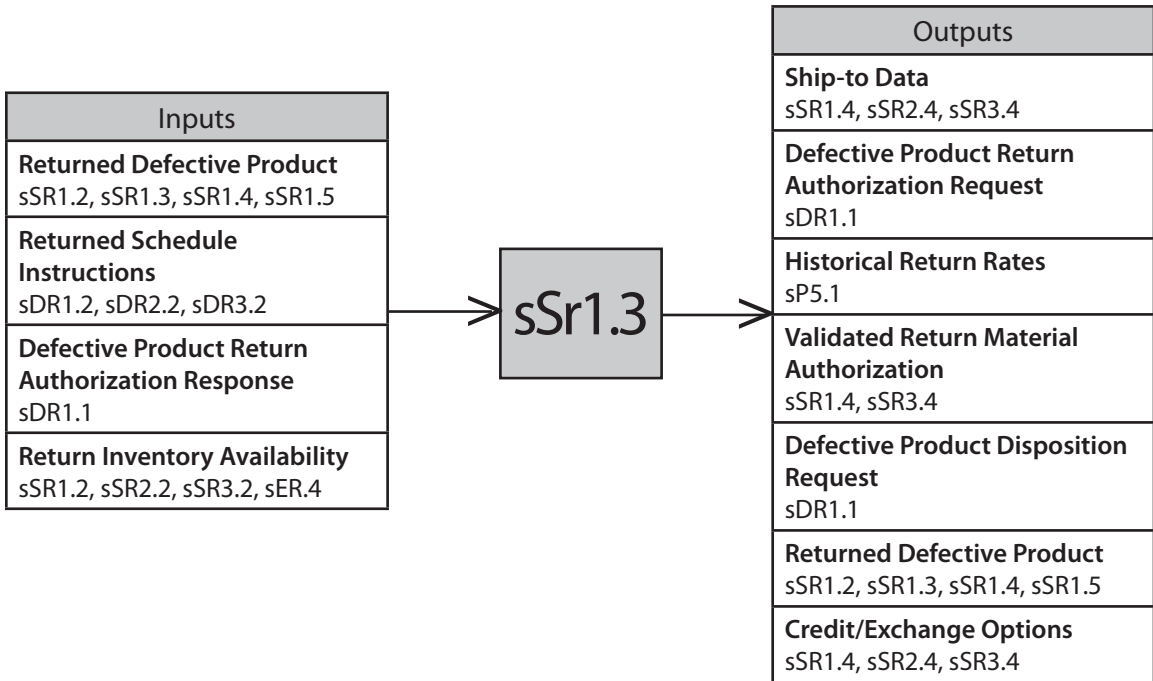


Request Defective Product Return Authorization

The process of a customer requesting and obtaining authorization, from last known holder or designated return center, for the return of defective product. Additionally, the customer and last known holder or designated return center would discuss enabling conditions such as return replacement or credit, packaging, handling, transportation and import / export requirements to facilitate the efficient return of the defective product.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain costs	Ratio of Authorization Cost to Total Source Return cost
Supply Chain Costs	Cost per request authorization
Supply Chain Asset Management	Value of Defective Product Inventory in Request Return Authorization Stage/ Total
Best Practices	Description/Definition
Clarify Point of Contact and Return Location	Electronic rules for business relationships and transactions.
Develop and Clarify Mutually Understood Cycle Times to Process Return Authorizations	Clarification as to who will pay in-bound and out-bound freight cost.
Long-Term Return Agreements / Partnerships	None identified
Enable Customer-Service Representatives to Complete the Bill Of Lading for the Customer Including Carrier Routing, Weight, Description and Class to Minimize Guesswork & Wrong Estimates	Clarification of policy if authorizations are not processed within the expected cycle time.

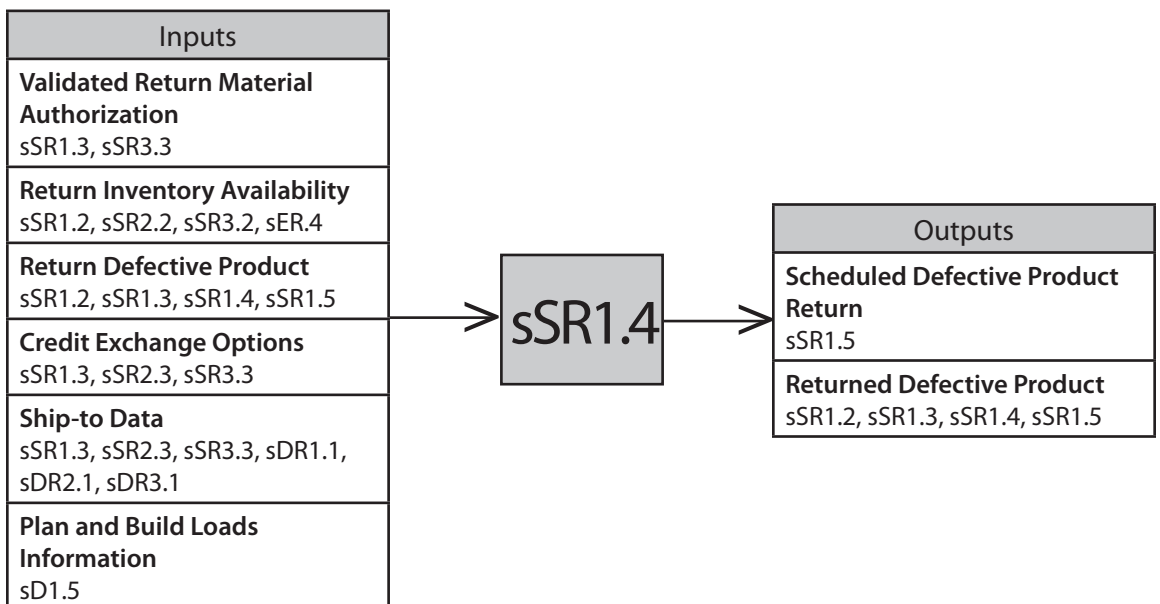
sSR1.3



Schedule Defective Product Shipment

The process where the customer develops the schedule for a carrier to pick-up for delivery of the defective product. Activities include selecting the carrier and rates, preparing the item for transfer, preparing scheduling documentation and managing overall scheduling administration.

Performance Attributes	Metric
Supply Chain Reliability	% Shipping Schedules that Support Customer Required Return by Date
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	% Defective Product Scheduling Cost to Total Source Return Cost
Supply Chain Asset Management	Value of defective product in scheduling stage/ total defective product
Best Practices	Description/Definition
Transportation Modeling and Rate Analysis	None identified
Consolidation of Return Carriers	Outbound logistics software to assist with route.
Carrier Selection Based on Performance Criteria at Least Cost	Scheduling, carrier selection, and rating

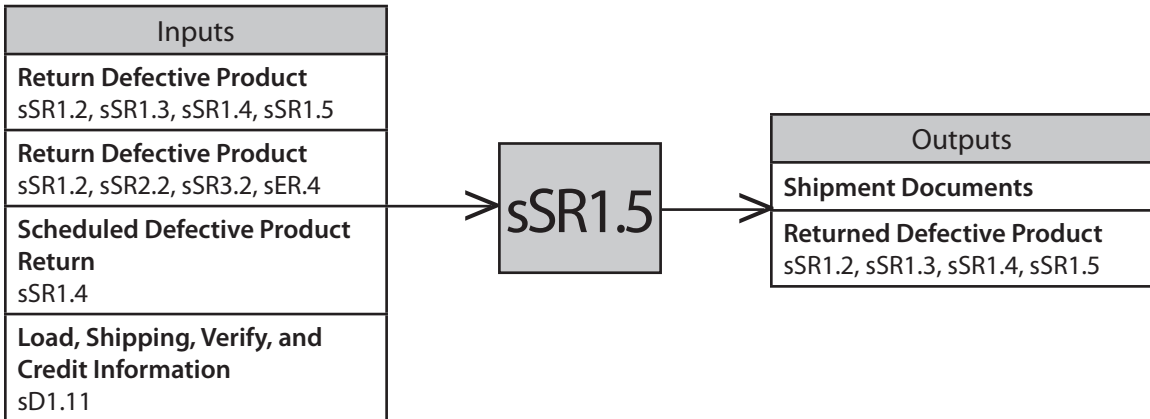


sSR1.5

Return Defective Product

The process where the customer packages, and handles the defective product in preparation for shipping in accord with pre-determined conditions. The product is then provided by the customer to the carrier who physically transports the product and its associated documentation to the last known holder or designated return center.

Performance Attributes	Metric
Supply Chain Reliability	% Error-free Returns Shipped, Return Shipments Shipped on Time
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Return transportation costs, Cost per request authorization
Supply Chain Asset Management	Rebuild or recycle rate, Value of defective product inventory in physical return
Best Practices	Description/Definition
Advanced Shipping Notice	Integrated data sharing with repair facility.
Shipment Tracking and Tracing	Satellite communications, GPS, RFID



Deliver Return Defective Product

The receipt and disposition determination of defective products as defined by the warranty claims, product recall, non-conforming product and/or other similar policies including appropriate replacement. The Return Defective Product supports any type of product not conforming to specifications (including order non-conformance such as late or otherwise improper delivery); company business rules determine the definition of 'defective'. The physical disposition of the product may not be part of the return process.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Deliver Return Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Deliver Return
Supply Chain Asset Management	Return on Working Capital, Return on Supply Chain Fixed Assets, Value of defective product inventory/ total defective product inventory value, Return Rate

sDR1

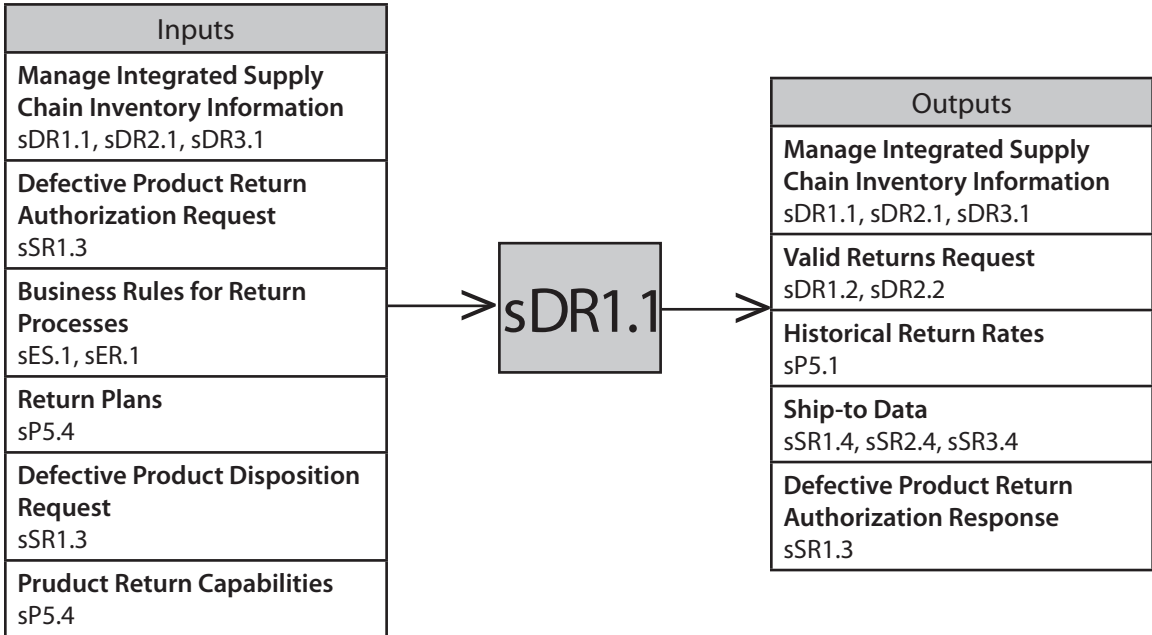


Authorize Defective Product Return

The process where the last known holder or designated return center receives a defective product return authorization request from a customer, determines if the item can be accepted and communicates decision to the customer. Accepting the request would include negotiating the conditions of the return with the customer, including authorizing return replacement or credit. Rejecting the request would include providing a reason for the rejection to the customer.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Authorize Defective Product Return Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Authorize Defective Product Return
Supply Chain Asset Management	Value of Defective Product Inventory in Request Return Authorization Stage/ Total
Best Practices	Description/Definition
Communicate with Customer before the Return to Establish What Types of Returns Are Acceptable	None identified
Avoid returns beyond economic repair	Estimate damage to product and do not physically return product that is beyond economical repair or offers no diagnostic value
Set Up Electronic or Pre-authorized Returns	None identified
Use an Exchange System Where Customer is Issued a Serviceable Item Upon Submitting an Unserviceable Item	None identified

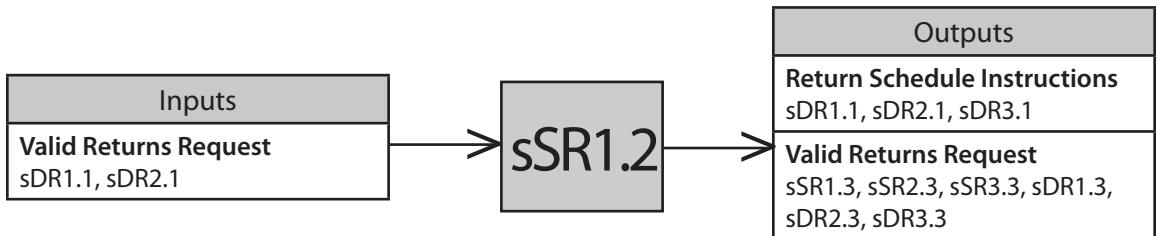
sDR1.1



Schedule Defective Return Receipt

The process where the last known holder or designated return center evaluates the defective product handling requirements including negotiated conditions and develops a schedule that tells the Customer when to ship the product. The scheduling activity would also inform Receiving when to expect the shipment and where to send the product, for disposition, upon receipt.

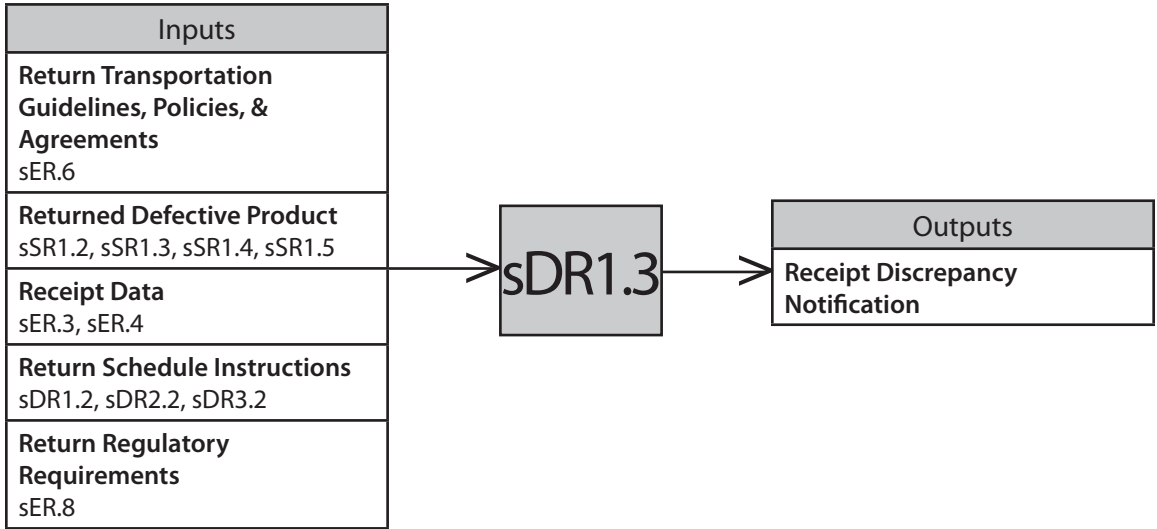
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Schedule Defective Return Receipt Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Schedule Defective Product Receipt
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Integrate Return Planning with Maintenance and Inventory Planning to Optimize the System	Both customer and Service Provider departments are alerted at the same time and viewing the same information.



Receive Defective Product (includes verify)

The process where the last known holder or designated return center receives and verifies the returned defective product against the return authorization and other documentation and prepares the item for transfer.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Receive Defective Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Defective Product, Energy Costs
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Develop Local Receiving Process Close to Repair	Minimize time spent in product movement.
Receivers on the Dock Communicate Directly with the Buyer to Efficiently Resolve Any Discrepancies	Buyer's name for every receipt is clearly visible on Receiver.
Pre-Certify Supplier Capability to Send Return Products Correctly to Minimize the Need for Receipt Verification	<ul style="list-style-type: none"> • Push inspection to SOURCE • Receiving quality criteria connected to ISO 9000 practices
Customer Sends Receiving Advanced Shipment Notification Prior to Shipment	Electronically link Return authorization, Return schedule and shipping documents. .
Electronically Track Shipment from Customer to Service Provider	None Identified
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices • Generate bar coded receiving documents. • Product serial number used as identifier • RFID

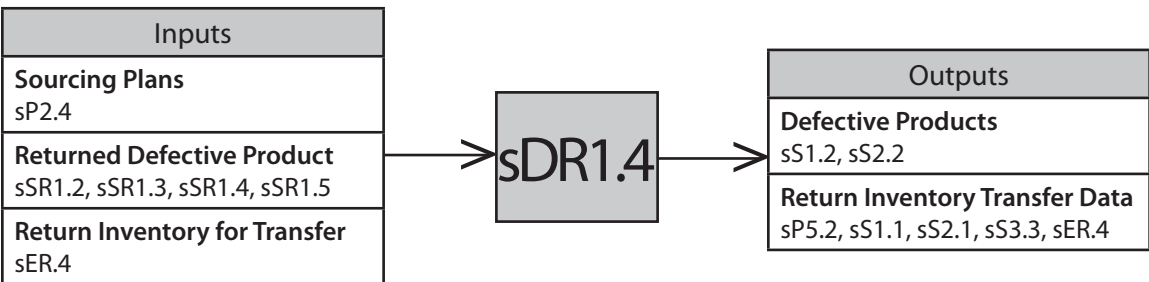


sDR1.4

Transfer Defective Product

The process where the last known holder or designated return center transfers the defective product to the appropriate process to implement the disposition decision.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Transfer Defective Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Transfer Defective Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Defective Products Scheduling Identifies Next Destination (Source, Make, or Deliver) on Return Authorization	Utilize electronic links
Receiving Equipment and Packaging Materials to Transfer Product Are Planned for In Advance and Readily Available When Needed	Include packaging materials in inventory management system and treat as any other inventory to minimize potential of stock-out.
Return Process Electronically Tracks Transfer from Station to Station	Utilize Bar coding
Review Transfer Cycle Time Trends and Determine If Equipment Capacity is Properly Balanced with Projected Usage	Periodic review of capital asset plan to determine if additional equipment, if needed, can be funded.

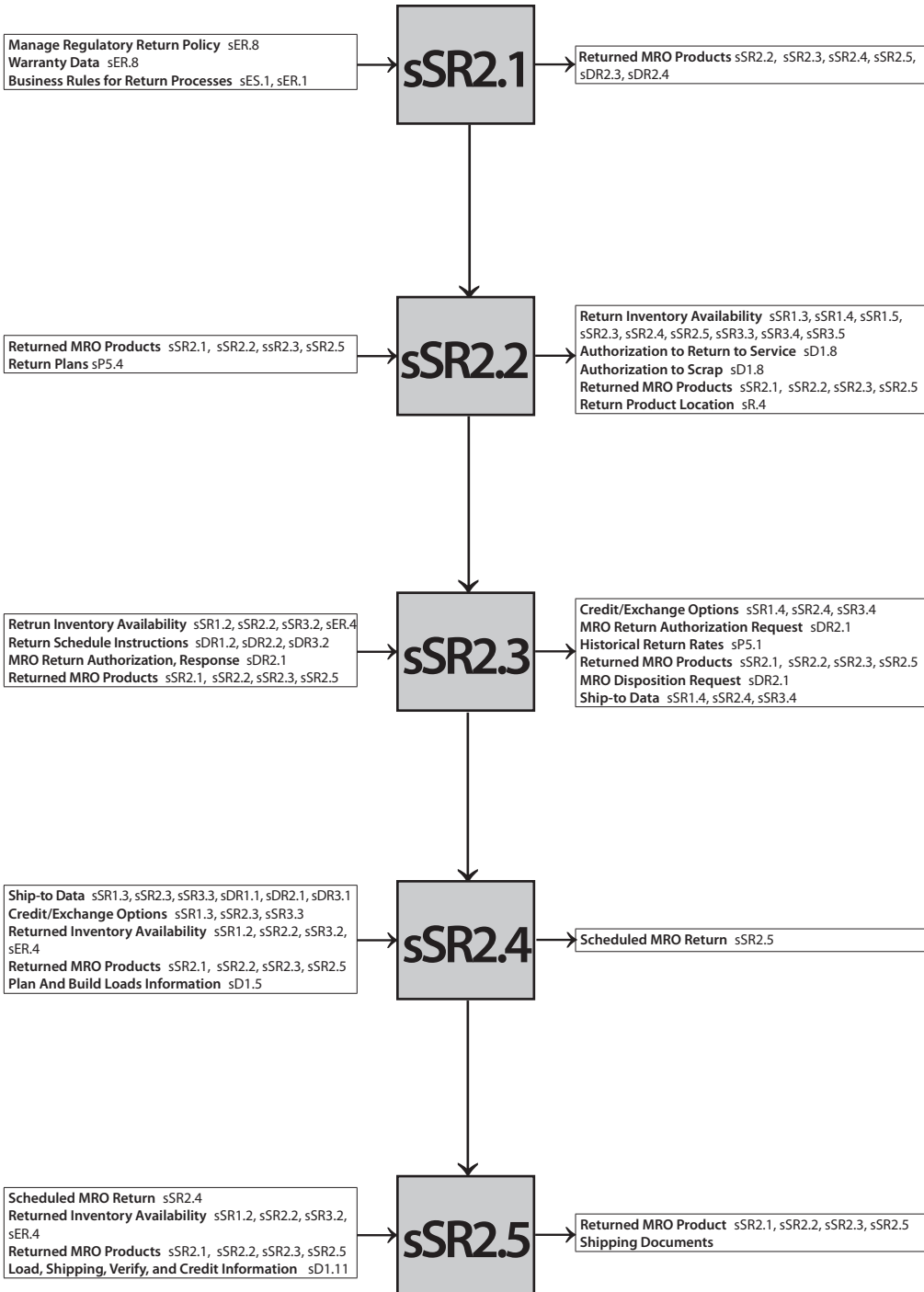


Source Return MRO Product

The return of Maintenance, Repair and Overhaul (MRO) products or company assets for the purpose of servicing, repairing or upgrading it, as defined by Maintenance Plans or the occurrence or anticipation of risk of failure. Generally company assets managed through a MRO process are expected to be refurbished to a useable condition and returned to service. The Return process does not represent the actual maintenance, repair or overhaul activities; these are generally represented by Make processes. The physical disposition of the product may not be part of the return process.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Order Fulfillment Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Total Source Return Costs
Supply Chain Asset Management	Return on Working Capital, Rebuild or recycle rate, Return on Supply Chain Fixed Assets

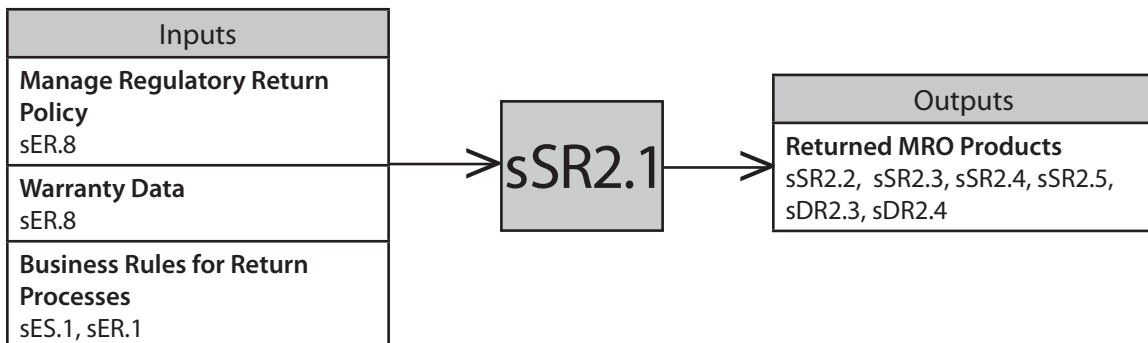
sSR2



Identify MRO Product Condition

The process where the customer utilizes pre-determined MRO policies, business rules and product operating conditions as criteria to identify and confirm that an item requires maintenance, repair, overhaul or disposal. Includes operating failures and planned maintenance requirements.

Performance Attributes	Metric
Supply Chain Reliability	Total # of Confirmed MRO Conditions/Total # of MRO Service Requests Initiated
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Cost of Identifying the MRO Condition as a % of Total Source Return Cost
Supply Chain Asset Management	Value of Unserviceable MRO Inv. in Identification Stage/ Total MRO Inv. Value
Best Practices	Description/Definition
None Identified	None identified

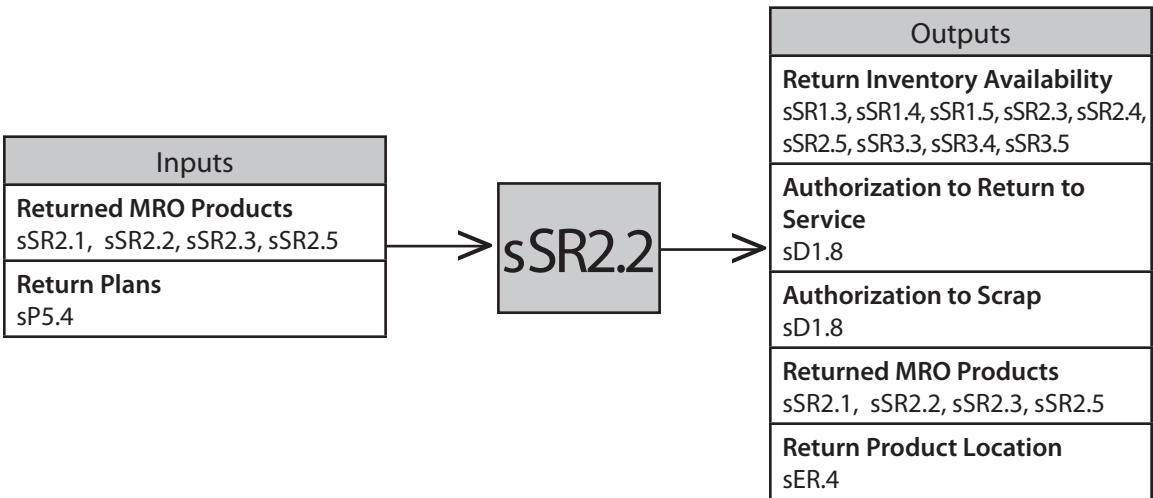


sSR2.2

Disposition MRO Product

The process of the customer determining whether to service the item, what service is required, and who the appropriate service provider would be to service the item. Outputs include a decision to: (1) send a return authorization request to a service provider, (2) send the product back into service without requiring a return authorization request, or (3) discard the item.

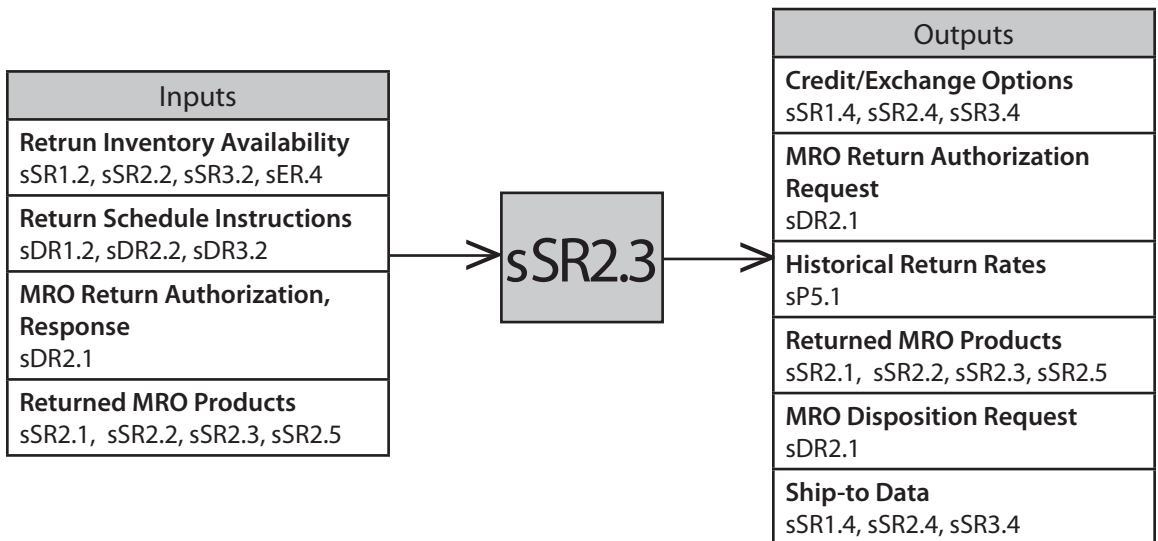
Performance Attributes	Metric
Supply Chain Reliability	% Identified MRO Products Returned To Service
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	MRO Disposition Costs As % Total Source cost
Supply Chain Asset Management	Value of Defective Inventory in Disposition Stage/ Total Inventory Value, Value of Unserviceable MRO Inventory In Disposition Stage/ Total MRO Inventory Va



Request MRO Return Authorization

The process of a customer requesting and obtaining authorization, from a service provider, for the return of an MRO product. In addition to discussing the MRO issue, the customer and service provider would discuss enabling conditions such as return replacement or credit, packaging, handling, transportation and import / export requirements to facilitate the efficient return of the MRO product to the service provider. The customer may need to go through several return authorization iterations with multiple service providers before authorization is received.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Cost per request authorization, Ratio of authorization costs to total source return cost , % of authorization request transmitted error-free/total authorization requests
Supply Chain Asset Management	Value of Unserviceable MRO Inventory in Request Return Authorization Stage/ Total

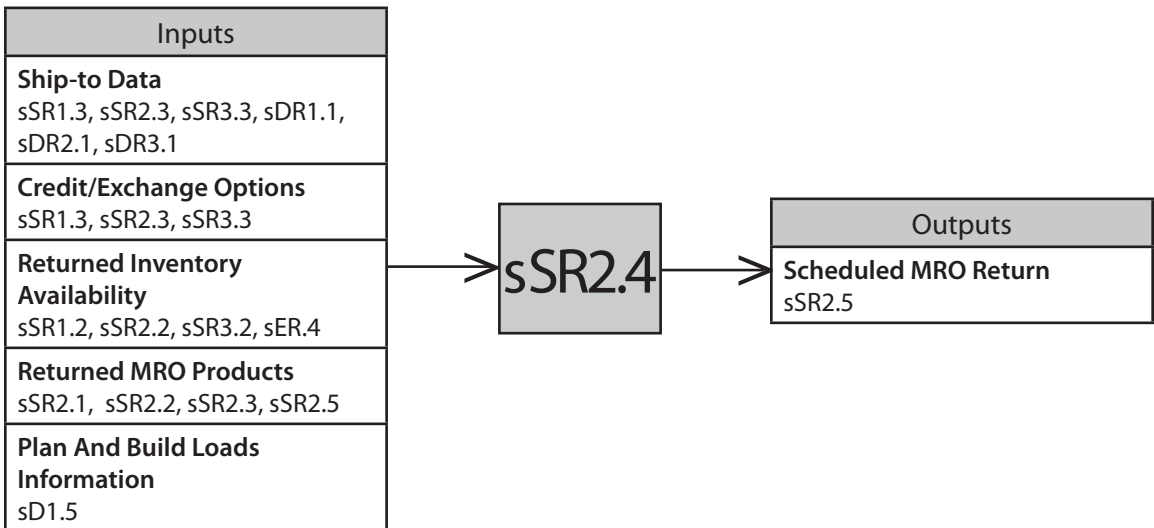


sSR2.4

Schedule MRO Shipment

The process where the customer develops the schedule for a carrier to pick-up and deliver the MRO product. Activities include selecting the carrier and rates, preparing the item for transfer, preparing scheduling documentation and managing overall scheduling administration.

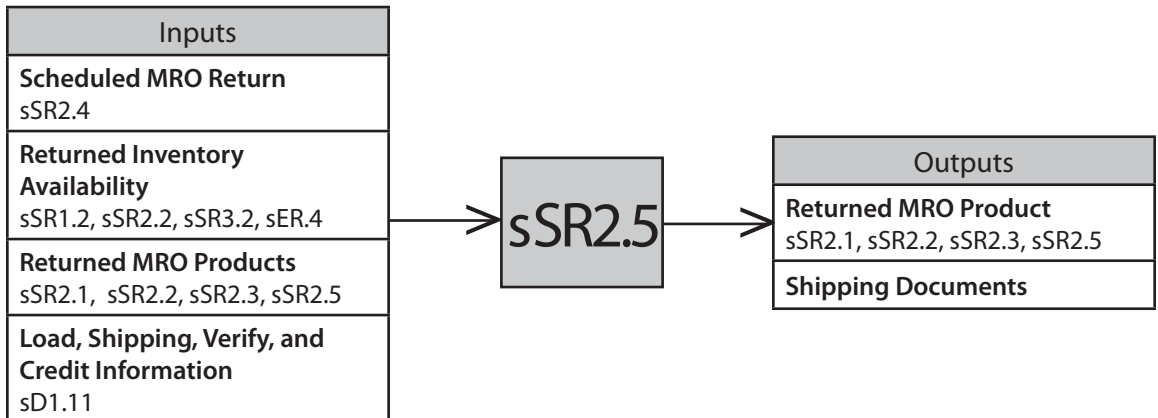
Performance Attributes	Metric
Supply Chain Reliability	% Shipping Schedules that Support Customer Required Return by Date
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	% MRO Scheduling Cost to Total Source Return Cost
Supply Chain Asset Management	Value of Unserviceable MRO Inventory in Scheduling Stage/ Total MRO Inventory
Best Practices	Description/Definition
Carrier Selection Based on Performance Criteria at Least Cost	Scheduling, carrier selection, and rating
Transportation Modeling and Rate Analysis	None identified
Consolidation of Return Carriers	Outbound logistics software to assist with route.



Return MRO Product

The process where the customer packages, and handles the MRO product in preparation for shipping in accord with pre-determined conditions. The product is then provided by the customer to the carrier who physically transports the product and its associated documentation to the service provider.

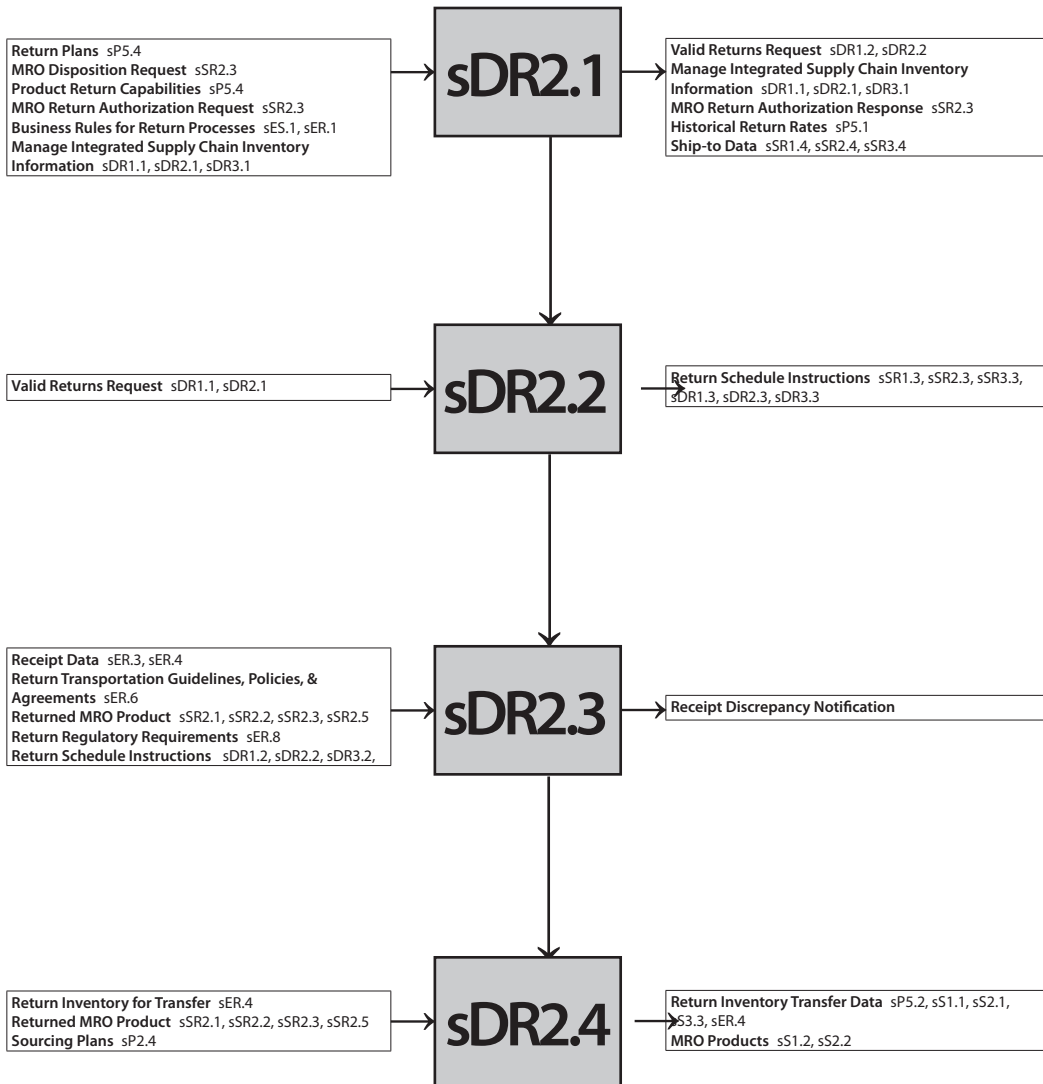
Performance Attributes	Metric
Supply Chain Reliability	Return Shipments Shipped on Time, % Error-free Returns Shipped
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Cost per request authorization, Return transportation costs
Supply Chain Asset Management	Value of unserviceable mro inventory in physical return and transportation stage/
Best Practices	Description/Definition
Advanced Shipping Notice	Integrated data sharing with repair facility.
Shipment Tracking and Tracing	Satellite communications, GPS, RFID



Deliver Return MRO Product

The receipt of Maintenance, Repair and Overhaul (MRO) products or company assets for the purpose of servicing, repairing or upgrading it, as defined by Maintenance Plans or the occurrence or anticipation of risk of failure. Generally company assets managed through a MRO process are expected to be refurbished to a useable condition and returned to service. The Return process does not represent the actual maintenance, repair or overhaul activities; these are generally represented by Make processes. The physical disposition of the product may not be part of the return process.

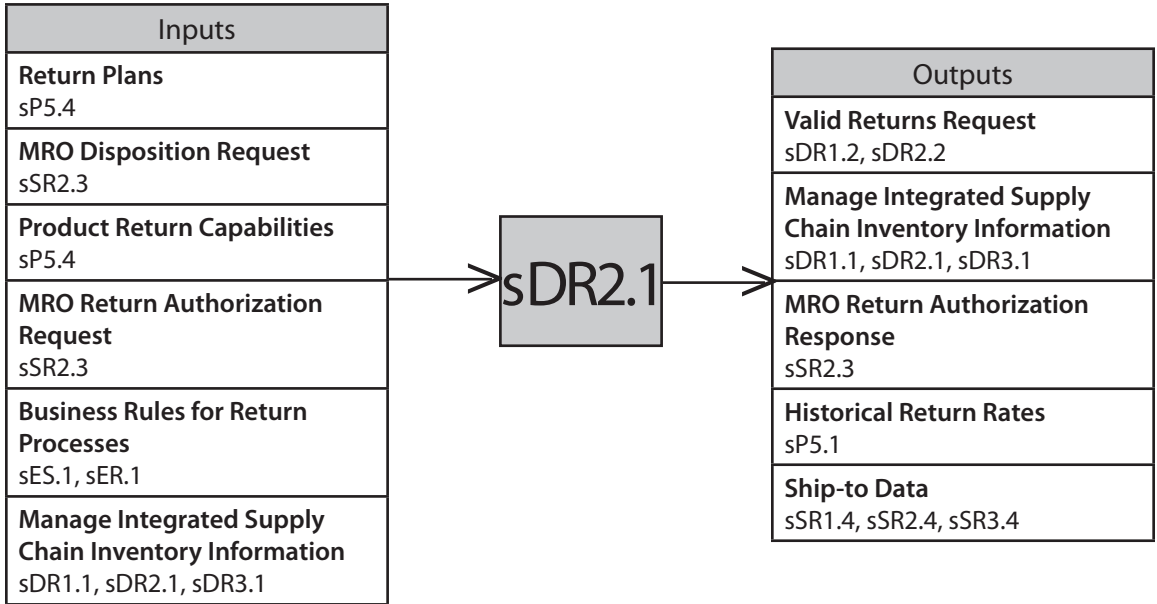
Performance Attributes	Metric
Supply Chain Reliability	% of MRO returns delivered to the correct service provider location
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Deliver Return Cycle Time
Supply Chain Agility	Upside Deliver Return Flexibility, Upside Deliver Return Adaptability
Supply Chain Costs	Cost to Deliver Return
Supply Chain Asset Management	Return on Working Capital, Value of Unserviceable MRO Inventory In Disposition Stage/ Total MRO Inventory Va, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
None Identified	None identified



Authorize MRO Product Return

The process where a service provider receives an MRO product return authorization request from a customer, determines if the item can be accepted for MRO and communicates their decision to the customer. Accepting the request would include negotiating the conditions of the return with the customer, including authorizing return replacement or credit. Rejecting the request would include providing a reason for the rejection to the customer.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Authorize MRO Product Return Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Authorize MRO Product Return
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Avoid returns beyond economic repair	Estimate damage to product and do not physically return product that is beyond economical repair or offers no diagnostic value
Set Up Electronic or Pre-authorized Returns	None identified
Communicate with Customer before the Return to Establish What Types of Returns Are Acceptable	None identified
Use an Exchange System Where Customer is Issued a Serviceable Item Upon Submitting an Unserviceable Item	None identified



sDR2.2

Schedule MRO Return Receipt

The process where the service provider evaluates the MRO service requirements including negotiated conditions and develops a schedule that tells the Customer when to ship the part. The scheduling activity would also inform Receiving when to expect the shipment and where to send the part, for induction or storage, upon receipt.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Schedule MRO Return Receipt Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Schedule MRO Product Receipt
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Consolidate shipments where possible	Consolidate shipments where possible
Integrate Return Planning with Maintenance and Inventory Planning to Optimize the System	Both customer and Service Provider departments are alerted at the same time and viewing the same information.

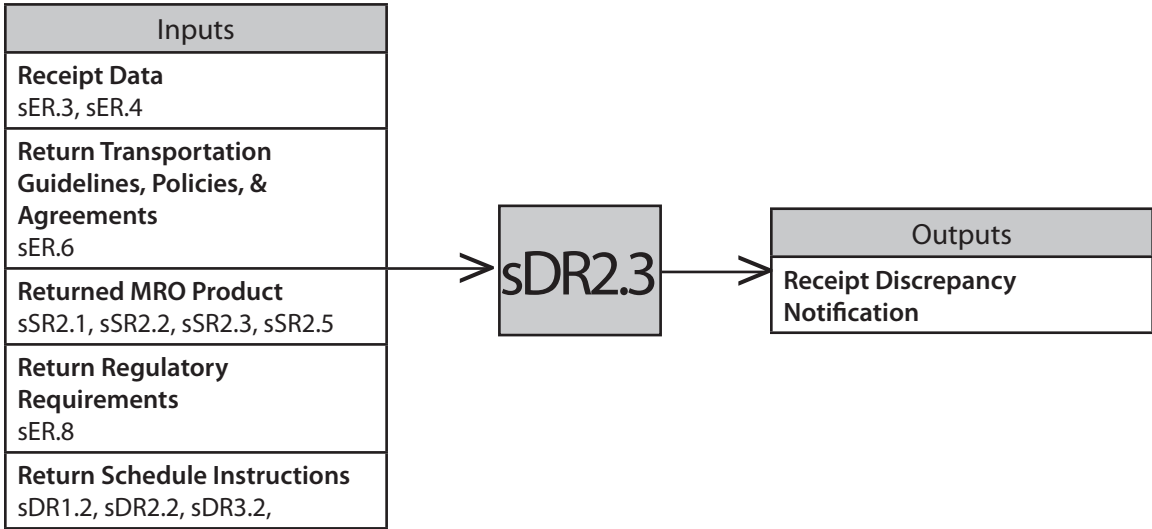


Receive MRO Product

The process where the service provider receives and verifies the returned MRO item against the return authorization and other documentation and prepares the item for transfer.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Receive MRO Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive MRO Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Electronically Track Shipment from Customer to Service Provider	None Identified
Develop Local Receiving Process Close to Repair	Minimize time spent in product movement.
Customer Sends Receiving Advanced Shipment Notification Prior to Shipment	Electronically link Return authorization, Return schedule and shipping documents. .
Receivers on the Dock Communicate Directly with the Buyer to Efficiently Resolve Any Discrepancies	Buyer's name for every receipt is clearly visible on Receiver.
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices. • Generate bar coded receiving documents. • Product serial number used as identifier • RFID
Pre-Certify Supplier Capability to Send Return Products Correctly to Minimize the Need for Receipt Verification	<ul style="list-style-type: none"> • Push inspection to SOURCE • Receiving quality criteria connected to ISO 9000 practices

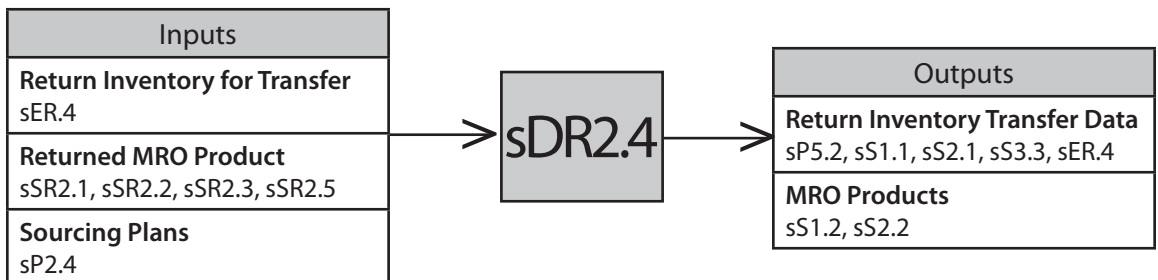
sDR2.3



Transfer MRO Product

The process where the service provider transfers the MRO product to the appropriate process to implement the disposition decision.

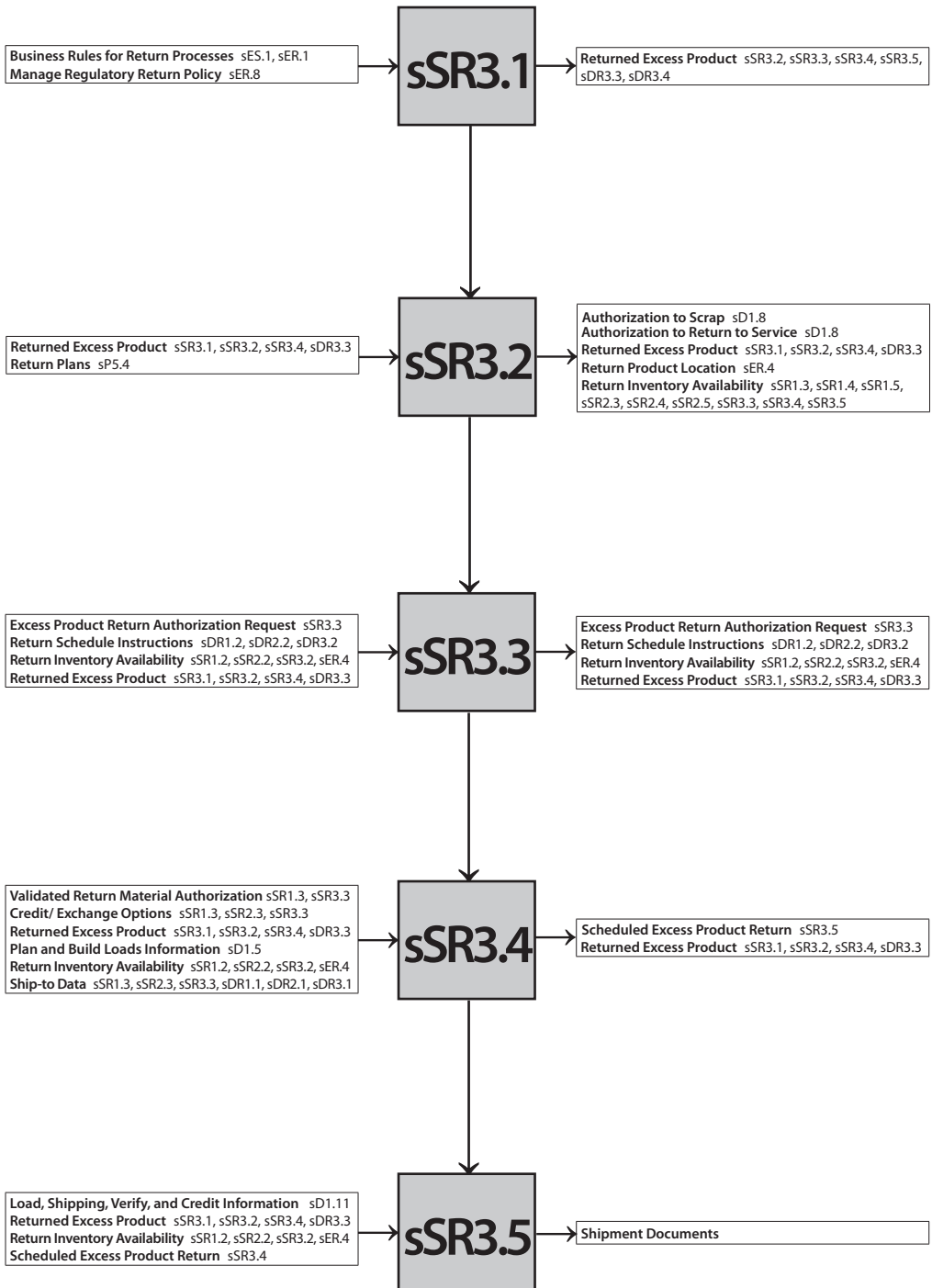
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Transfer MRO Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Transfer MRO Product, Energy Costs
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Review Transfer Cycle Time Trends and Determine If Equipment Capacity is Properly Balanced with Projected Usage	Periodic review of capital asset plan to determine if additional equipment, if needed, can be funded.
Receiving Equipment and Packaging Materials to Transfer Product Are Planned for In Advance and Readily Available When Needed	Include packaging materials in inventory management system and treat as any other inventory to minimize potential of stock-out.
Return Process Electronically Tracks Transfer from Station to Station	Utilize Bar coding
MRO Scheduling Identifies Next Destination (Stores or Repair Station) on Return Authorization	Utilize electronic links



Source Return Excess Product

The return of excess or aging inventory or obsolete products as defined by the terms and conditions of a customer/supplier contract. The intention of excess product returns is to reallocate inventory to a location or organization that can sell the product that is considered in excess in the current location. The physical disposition of the product may not be part of the return process.

Performance Attributes	Metric
Supply Chain Reliability	% of Excess Product Returns Delivered Complete to the Designated Return Center
Supply Chain Responsiveness	Order Fulfillment Cycle Time, Source Return Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Total Excess Material Return Costs, Cost to Source Return
Supply Chain Asset Management	Value of excess inventory/ total inventory value, Average age of Excess Inventory, Return on Working Capital, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
Enable customer direct shipments	Enable direct shipments between customers to reduce overall transportation and handling.

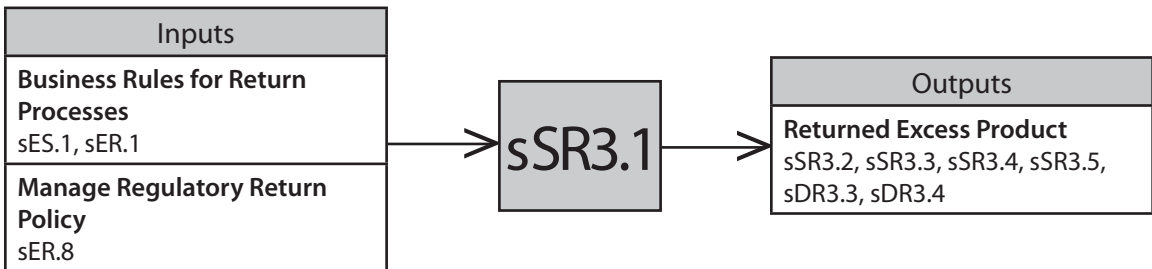


sSR3.1

Identify Excess Product Condition

The process where the customer utilizes planned policies, business rules and product inspection as criteria to identify and confirm that material is in excess of the current requirements.

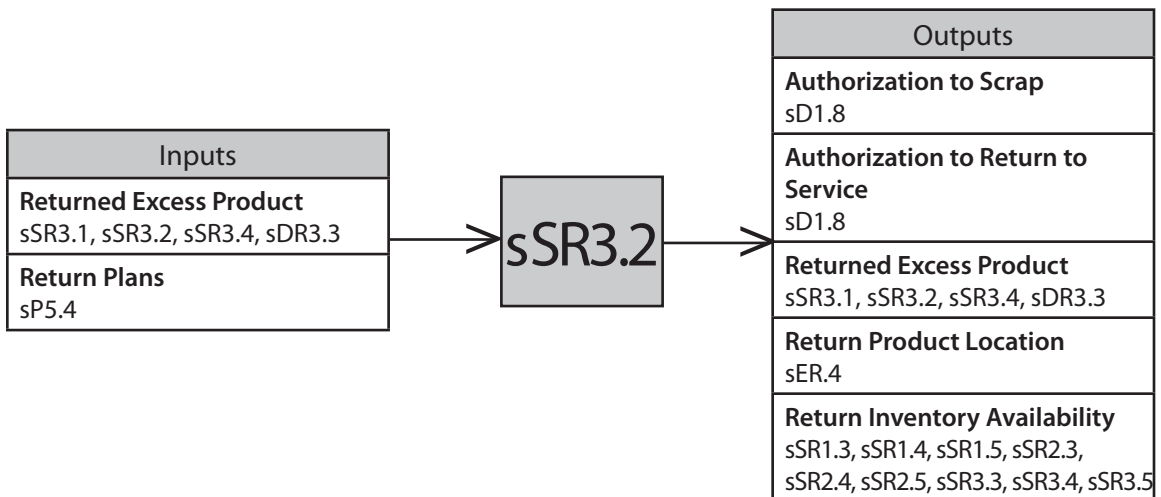
Performance Attributes	Metric
Supply Chain Reliability	Number of occurrences where excessive inventory is returned and followed
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Cost of identifying the excess condition as a % of total Source cost
Supply Chain Asset Management	Return on Working Capital, Value of excess inventory in identification stage/ total inventory value
Best Practices	Description/Definition
Automated Inventory Visibility and Planning System to Highlight Inventory in Excess of Requirements	Automated inventory planning package linked to real time demand data and inventory business rules.
Enterprise Level Policies/Rules with Local Execution	Web based access to enterprise level business rules



Disposition Excess Product

The process of the customer determining whether to return the excess material and identification of a designated return center a return authorization.

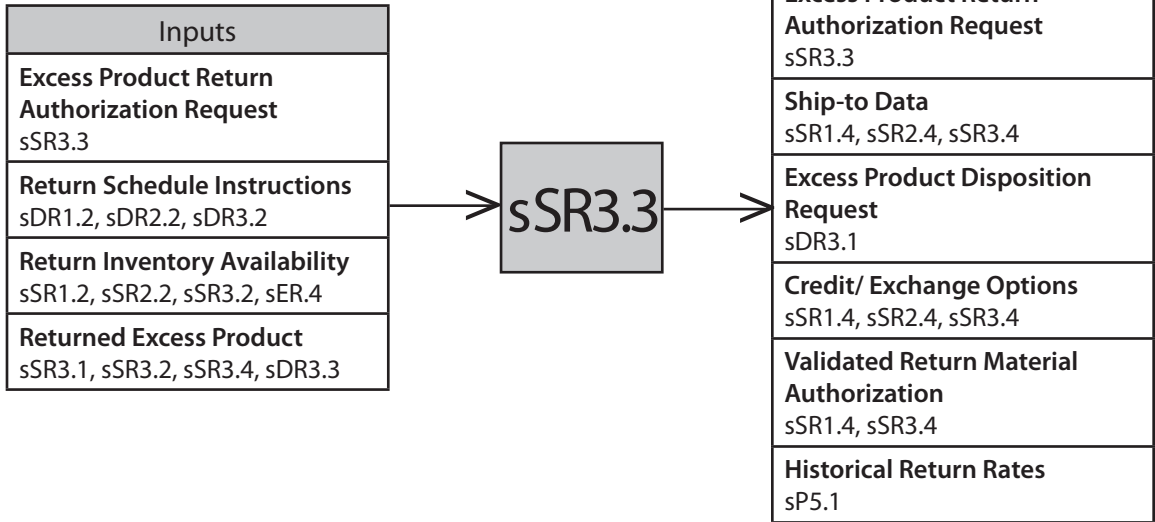
Performance Attributes	Metric
Supply Chain Reliability	Number of occurrences of incorrect designated return center
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Excess product disposition costs as % total Source cost
Supply Chain Asset Management	Value of Excess Inventory in Disposition Stage/ Total Inventory Value
Best Practices	Description/Definition
Drive Returns Directly to Return Stock Point of Disposition to Reduce Cost and Cycle Time	Specify return disposition location and time.
Automated Registry of Inventory Return Locations by Item to Speed Identification of Proper Return Location	None identified



Request Excess Product Return Authorization

The process of a customer requesting and obtaining authorization, from the designated return center, for the return of excess product. Additionally, the customer and designated return center would negotiate enabling conditions such as return credit or cash discount, packaging, handling, transportation and import / export requirements to facilitate the efficient return of the excess product.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	% of authorization request transmitted error-free/total authorization requests, Ratio of Authorization Cost To Total Source Cost, Cost per request authorization
Supply Chain Asset Management	Value of Excess Product Inventory in Request Return Authorization Stage/ Total Ex
Best Practices	Description/Definition
Clarify Point of Contact and Return Location	Electronic rules for business relationships and transactions.
Develop and Clarify Mutually Understood Cycle Times to Process Return Authorizations	Clarification as to who will pay in-bound and out-bound freight cost.
Enable Customer-Service Representatives to Complete the Bill Of Lading for the Customer Including Carrier Routing, Weight, Description and Class to Minimize Guesswork & Wrong Estimates	Clarification of policy if authorizations are not processed within the expected cycle time.
Long-Term Return Agreements / Partnerships	None identified

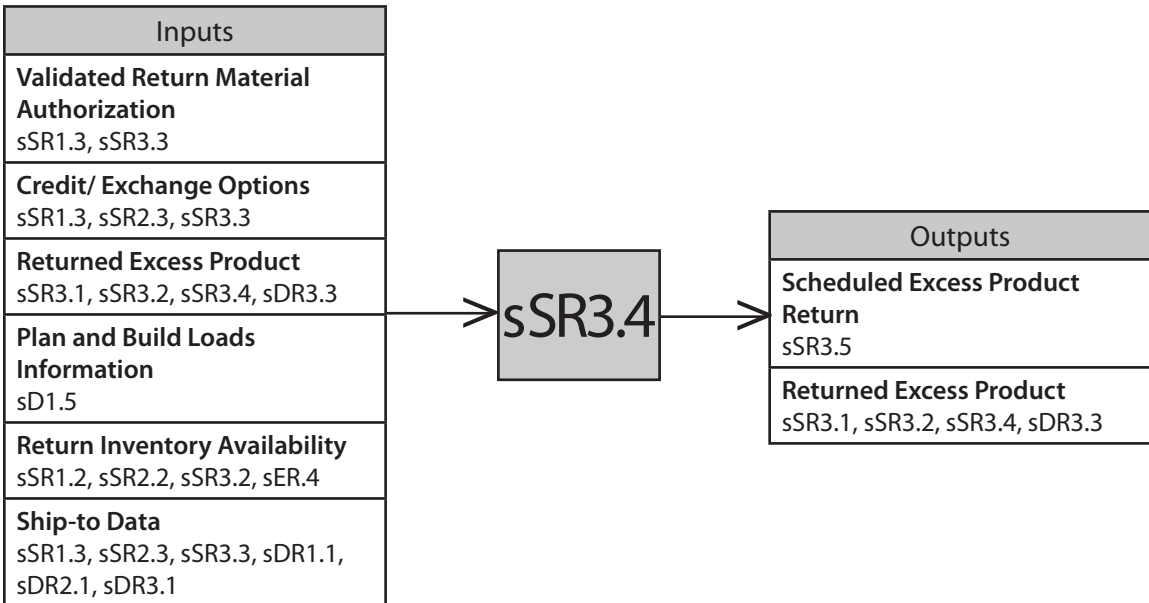


sSR3.4

Schedule Excess Product Shipment

The process where the customer develops the schedule for a carrier to pick-up the excess product. Activities include selecting the carrier and rates, preparing the item for transfer, preparing scheduling documentation and managing overall scheduling administration.

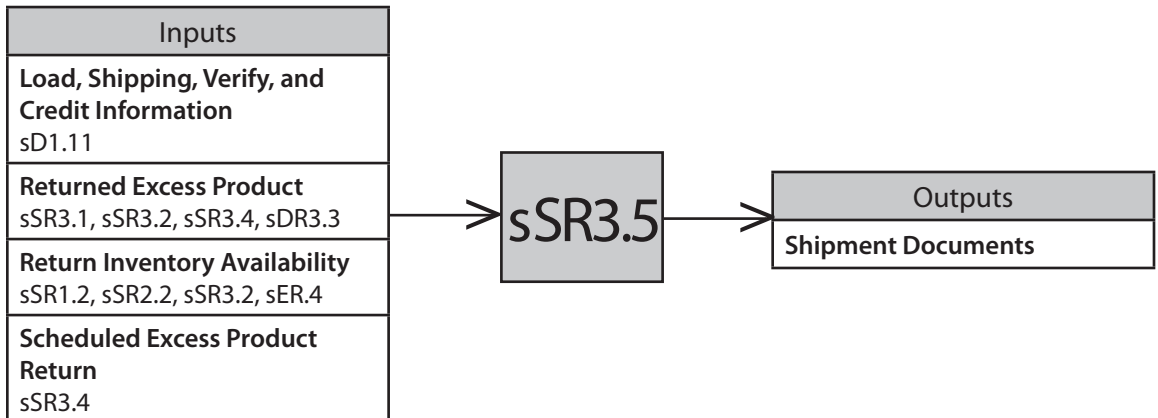
Performance Attributes	Metric
Supply Chain Reliability	% Shipping Schedules that Support Customer Required Return by Date
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	% Excess Product Scheduling Cost to Total Source Return Cost
Supply Chain Asset Management	Value of excess product in scheduling stage/ total excess product inv
Best Practices	Description/Definition
Carrier Selection Based on Performance Criteria at Least Cost	Scheduling, carrier selection, and rating
Arrange for Shipping Insurance in Case Of In-Transit Loss or Damage	Preventative management
Consolidation of Return Carriers	Outbound logistics software to assist with route.
Transportation Modeling and Rate Analysis	None identified



Return Excess Product

The process where the customer packages, and handles the excess product in preparation for shipping in accord with pre-determined conditions. The product is then provided by the customer to the carrier who physically transports the product and its associated documentation to the last known holder or designated return center.

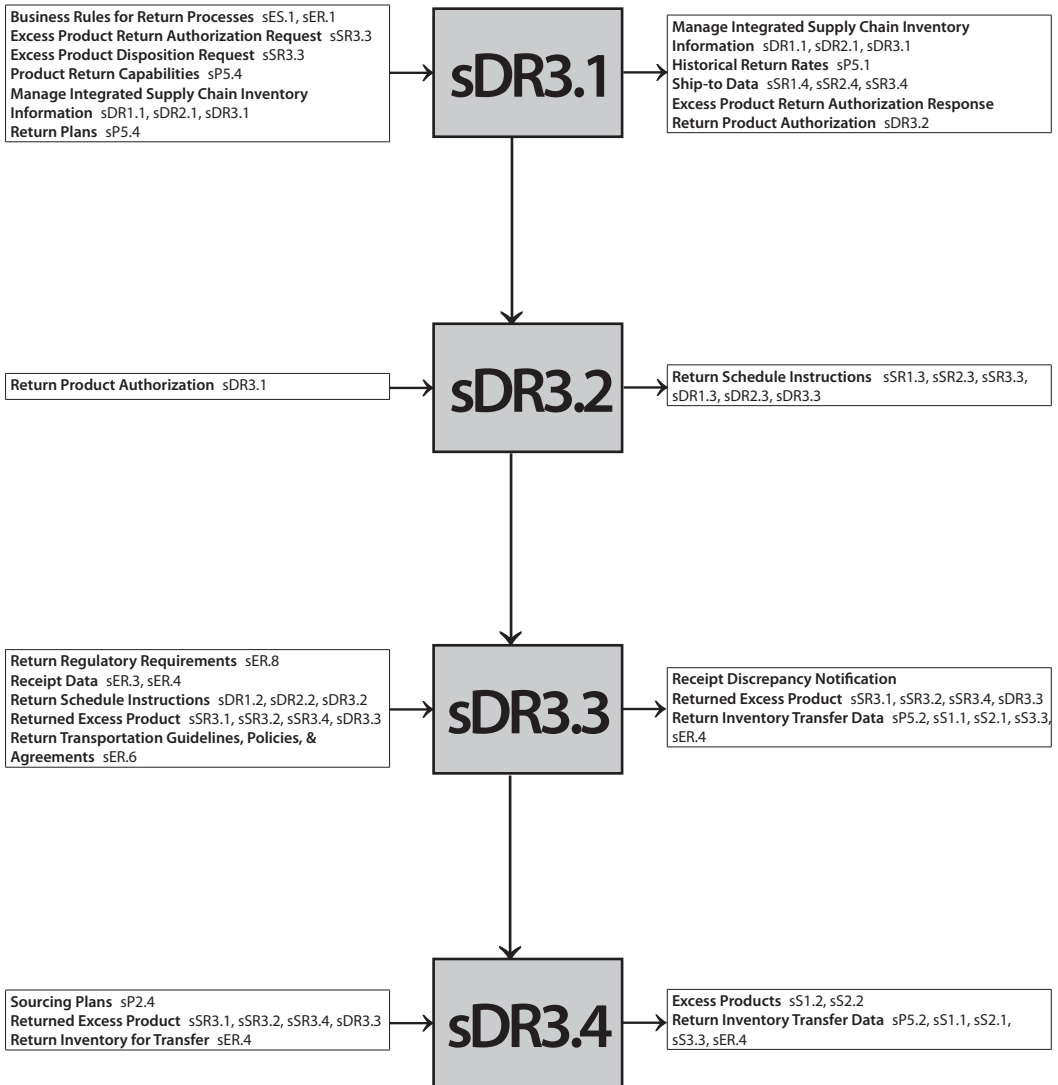
Performance Attributes	Metric
Supply Chain Reliability	% Error-free Returns Shipped, Return Shipments Shipped on Time
Supply Chain Responsiveness	None Identified
Supply Chain Agility	None Identified
Supply Chain Costs	Return transportation costs, Cost per request authorization
Supply Chain Asset Management	Value of excess product inventory in physical return and transportation stage/tot
Best Practices	Description/Definition
Shipment Tracking and Tracing	Satellite communications, GPS, RFID
Advanced Shipping Notice	Integrated data sharing with repair facility.



Deliver Return Excess Product

The receipt of excess or aging inventory or obsolete products as defined by the terms and conditions of a customer/supplier contract. The intention of excess product returns is to reallocate inventory to a location or organization that can sell the product that is considered in excess in the current location. The physical disposition of the product may not be part of the return process.

Performance Attributes	Metric
Supply Chain Reliability	% of Excess Product Returns Delivered Complete to the Designated Return Center
Supply Chain Responsiveness	Order Fulfillment Cycle Time
Supply Chain Agility	Upside Deliver Return Flexibility, Upside Deliver Return Adaptability
Supply Chain Costs	None Identified
Supply Chain Asset Management	Return for Recycle Rate, Return on Working Capital, Return on Supply Chain Fixed Assets
Best Practices	Description/Definition
Enable customer direct shipments	Enable direct shipments between customers to reduce overall transportation and handling.

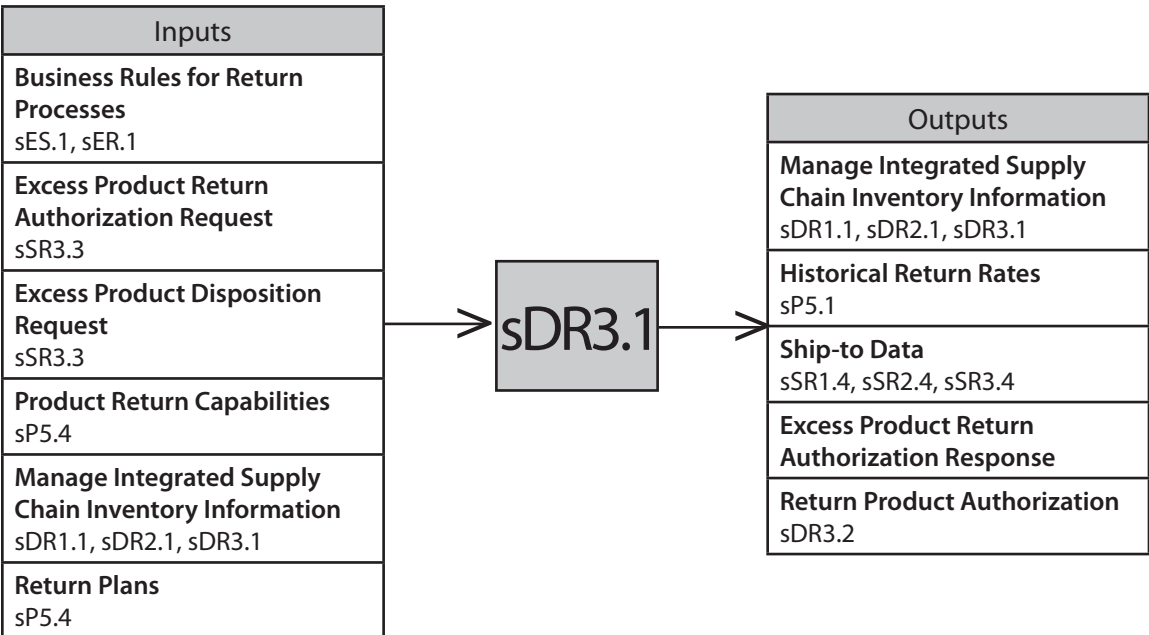


sDR3.1

Authorize Excess Product Return

The process where the designated return center receives an excess product return authorization request from a customer, determines if the item can be accepted and communicates their decision to the customer. Accepting the request would include negotiating the conditions of the return with the customer, including authorizing credit or cash discount. Rejecting the request would include providing a reason for the rejection to the customer.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Authorize Excess Product Return Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Authorize Excess Product Return
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Communicate with Customer before the Return to Establish What Types of Returns Are Acceptable	None identified
Set Up Electronic or Pre-authorized Returns	None identified



Schedule Excess Return Receipt

The process where the I designated return center evaluates an authorized excess material return to determine packaging and handling requirements. This assessment will lead to the development of a return disposition decision and a return schedule with terms and conditions that will tell the Customer how and when to ship the product. The scheduling activity would also inform the Return Center’s Receiving department when to expect the shipment and where to send the product, for disposition, upon receipt.

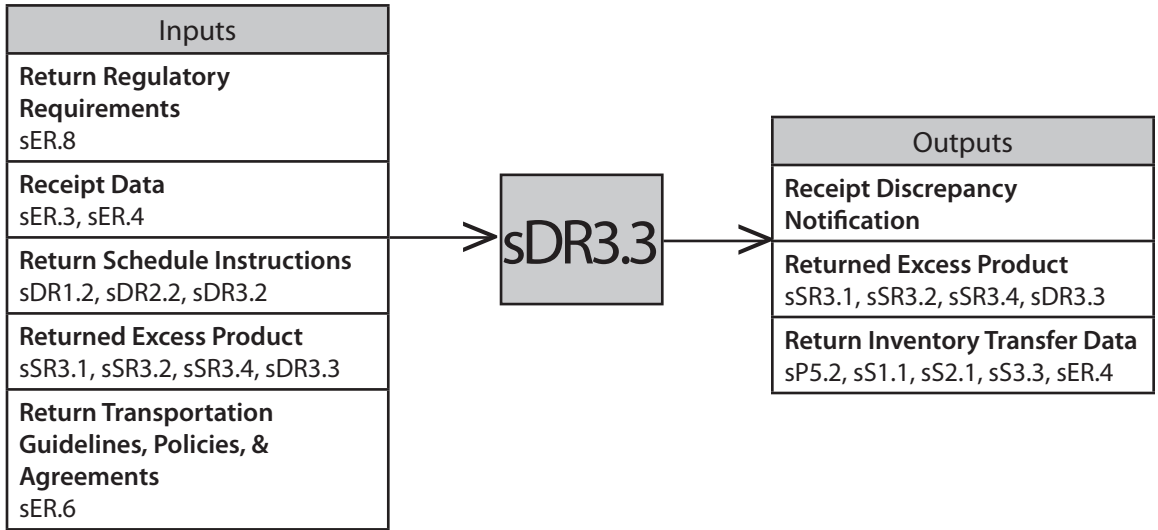
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Schedule Excess Return Receipt Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Energy Costs, Cost to Schedule Excess Product Receipt
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Establish Designated Processes for Scheduling and Receiving Excess Inventory	None Identified



Receive Excess Product

The process where the designated return center receives and verifies the returned excess product and associated documentation against the return authorization and other documentation and prepares the item for transfer. Administrate any discrepancies that arise.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Receive Excess Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Receive Excess Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Receivers on the Dock Communicate Directly with the Buyer to Efficiently Resolve Any Discrepancies	Buyer's name for every receipt is clearly visible on Receiver.
Develop Local Receiving Process Close to Repair	Minimize time spent in product movement.
Pre-Certify Supplier Capability to Send Return Products Correctly to Minimize the Need for Receipt Verification	<ul style="list-style-type: none"> • Push inspection to SOURCE • Receiving quality criteria connected to ISO 9000 practices
Electronically Track Shipment from Customer to Service Provider	None Identified
Customer Sends Receiving Advanced Shipment Notification Prior to Shipment	Electronically link Return authorization, Return schedule and shipping documents. .
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	<ul style="list-style-type: none"> • Bar code interface for data collection devices. • Generate bar coded receiving documents. • Product serial number used as identifier. • RFID

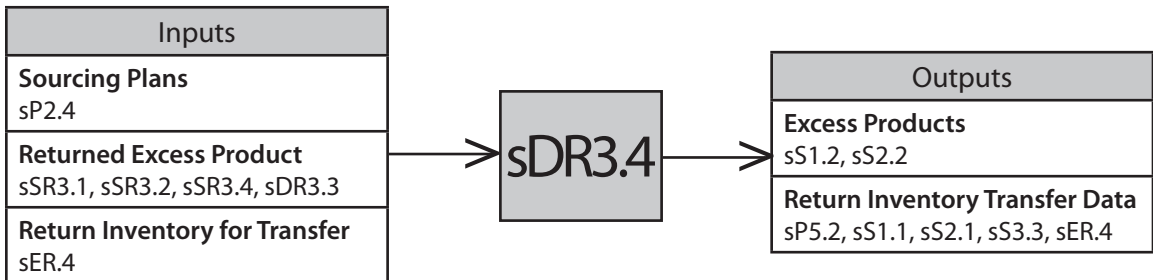


sDR3.4

Transfer Excess Product

The process where the designated return center transfers the excess product to the appropriate process to implement the disposition decision.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Transfer Excess Product Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Transfer Excess Product
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Receiving Equipment and Packaging Materials to Transfer Product Are Planned for In Advance and Readily Available When Needed	Include packaging materials in inventory management system and treat as any other inventory to minimize potential of stock-out.
Review Transfer Cycle Time Trends and Determine If Equipment Capacity is Properly Balanced with Projected Usage	Periodic review of capital asset plan to determine if additional equipment, if needed, can be funded.
Excess Products Scheduling Identifies Next Destination (Source, Make, or Deliver) on Return Authorization	Utilize electronic links
Return Process Electronically Tracks Transfer from Station to Station	Utilize Bar coding



Enable Return

The collection of processes associated with managing and monitoring Return process data, performance and relationships.

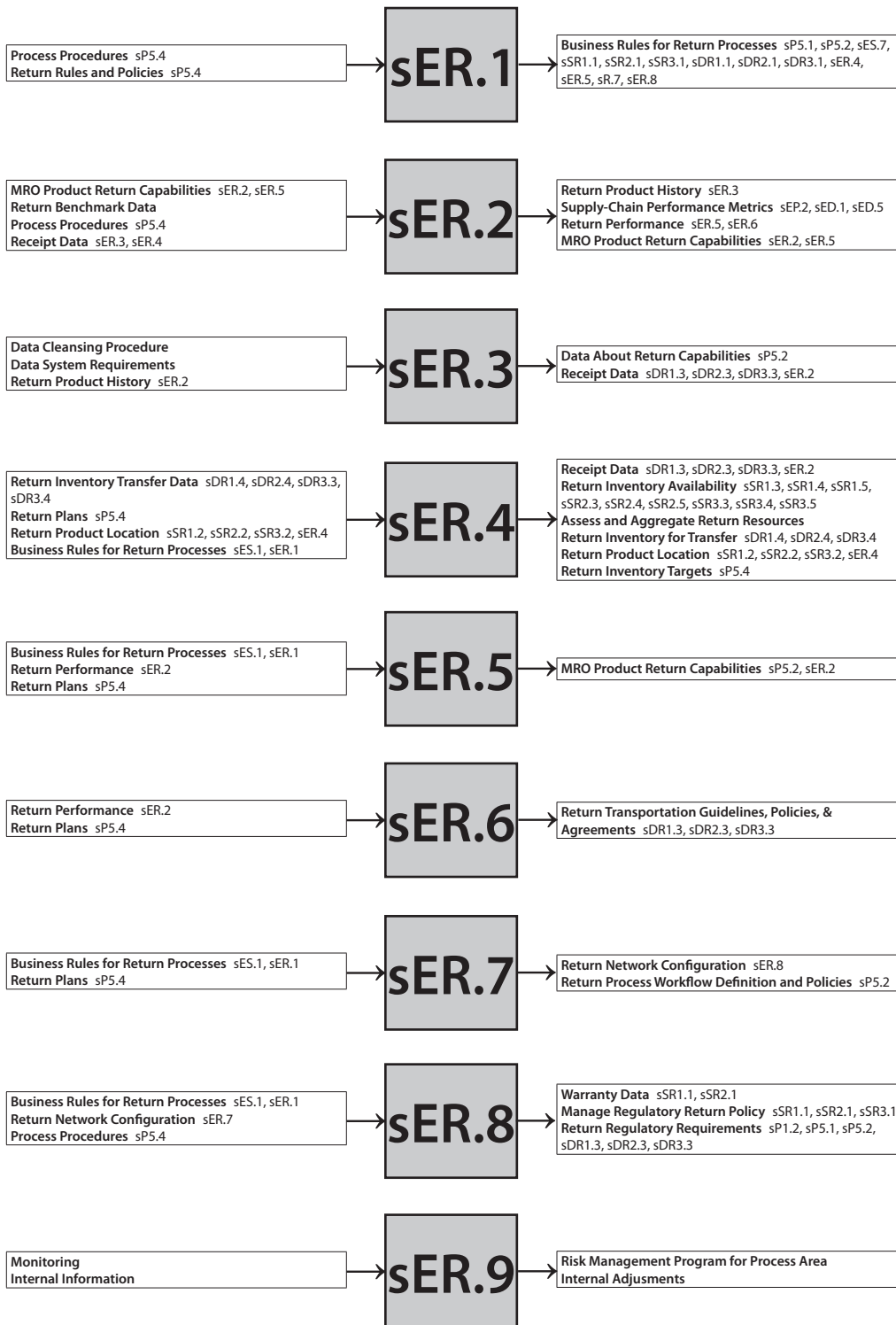
Process Categories	
sER.1: Manage Business Rules for Return Processes	The process of establishing, maintaining, and enforcing decision support criteria for Return Planning that are translated into rules for conducting business. These rules align Return process policies with business strategy, goals, and objectives.
sER.2: Manage Performance of Return Processes	The process of measuring actual Return Process performance against internal and/or external standards to develop and implement a course of action to achieve targeted performance levels.
sER.3: Manage Return Data Collection	The process of collecting, integrating and maintaining the accuracy of return execution information necessary to plan the recovery of supply chain resources.
sER.4: Manage Return Inventory	The process of establishing a return process inventory strategy and planning the recovery process inventory limits or levels (including Raw Material, Work In Process, Finished and Purchased Finished Goods) including replenishment models, ownership, product mix, and stocking locations, both inter and intra company.
sER.5: Manage Return Capital Assets	The process of acquiring, maintaining and dispositioning capital assets such as fork lift trucks, information systems and equipment in receiving docks that are utilized in support of Return. Management activities would include defining asset requirements, determining resource availability and conducting gap analysis and resolution. The process includes lease-buy and outsourcing decisions.
sER.6: Manage Return Transportation	The process of providing the least cost transportation of a returned product from a customer location to the appropriate service provider location within specified time frames. Can include interim transportation activities conducted within more than one service provider locations. Includes defining and implementing a Return transportation strategy throughout the supply chain, maintaining transportation-related information (rates, lead times) and managing transportation performance.
sER.7: Manage Return Network Configuration	The process where customer and service provider locations involved in the flow of returns are defined and maintained throughout the supply chain. Locations include retail and wholesale customer and supplier sites, manufacturing facilities, distribution centers, warehouses, repair depots and military bases.

sER.8: Manage Return Regulatory Requirements and Compliance

The process of identifying and complying with regulatory documentation and process standards set by external entities (i.e. government, trade officials, etc.) when planning for the Return of Assets. Includes Customs requirements and Import / Export Controls.

sER.9: Manage Supply Chain Return Risk

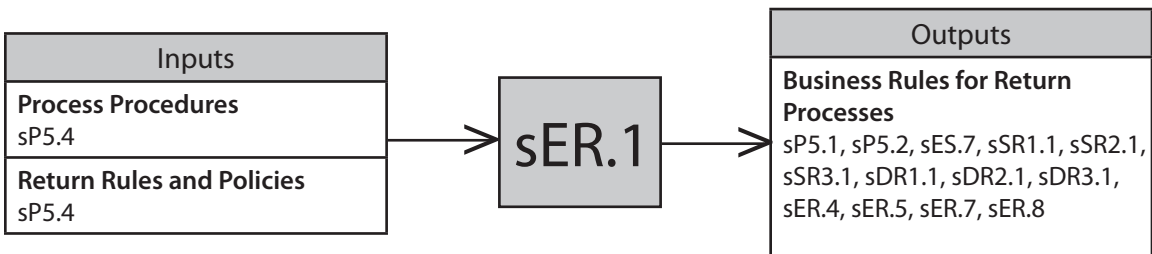
The process of managing Return risks within an overall Supply Chain Risk Program. This includes identifying and assessing Return risks as well as and planning and implementing responses to Return risks. Return risks include potential events that could impact you or the customer's ability to Return goods in a timely manner at a reasonable cost with minimal damage. Risk Management includes: mitigation, either reducing the impact of a risk event or reducing the likelihood it will occur.



Manage Business Rules for Return Processes

The process of establishing, maintaining, and enforcing decision support criteria for Return Planning that are translated into rules for conducting business. These rules align Return process policies with business strategy, goals, and objectives. Examples of business rules include those that (1) Enable customers to identify when scheduled and unscheduled conditions occur that require a return authorization request, (2) Enable a service provider to confirm a part is authorized to be returned, (3) Identify the waiting period to confirm a return item has been shipped and received before following up (4) Develop and maintain customer and channel performance standards of return processes such as service levels, given service requirements by supply chain stakeholders/trading partners.(5) Communicate to customers the allowable amount of elapsed time from purchase and condition in which excess material must be received in order for it to be accepted as a return (6) Negotiate any restocking charge stipulations.

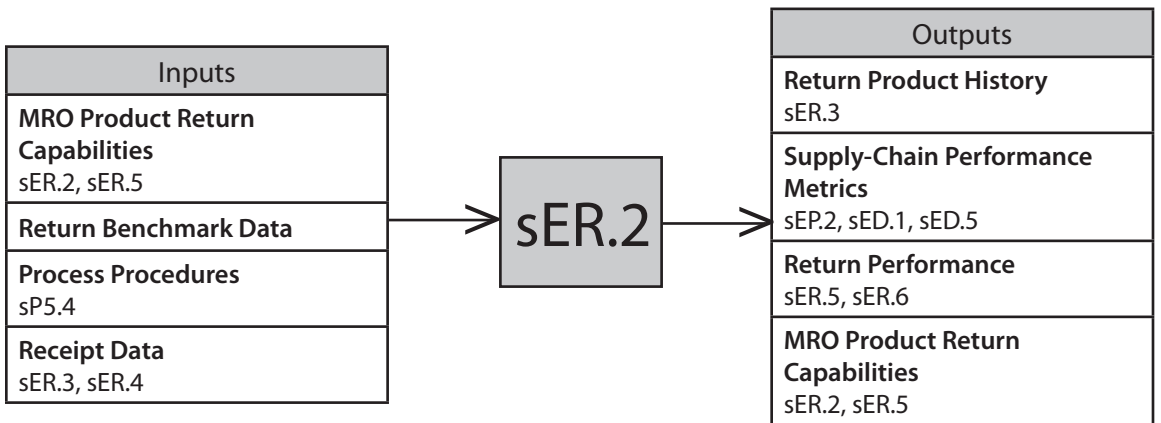
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Business Rules for Return Processes Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Business Rules for Return Processes
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Standard Inventory Policy to Determine Excess	None Identified
Utilize Real-World Cases in Employee Training	None Identified
Publish Return Policy	Easy access to return business rules.
Electronic Reminders of Possible Scheduled Maintenance	Pull signals.
Evaluate the Benefits of Out-Sourcing the Excess Material Return Process	Enables customer to focus on core competencies.



Manage Performance of Return Processes

The process of measuring actual Return Process performance against internal and/or external standards to develop and implement a course of action to achieve targeted performance levels.

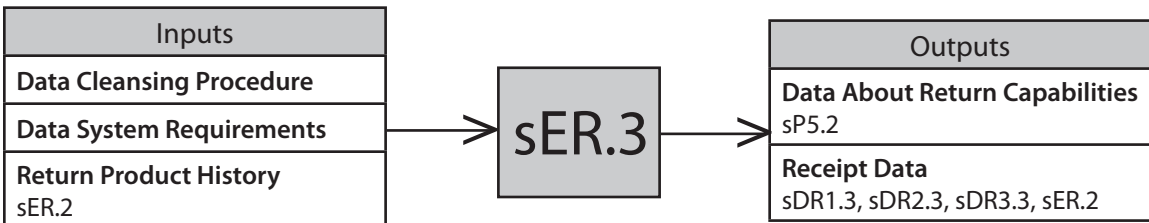
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Performance of Return Processes Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Performance of Return Processes
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Business Rules Are Clearly Communicated with the Customer	Convenient availability to business rules and return criteria.
Continuous Improvement is Planned through Process Reviews and Customer Feedback	Avenue to receive customer comments.



Manage Return Data Collection

The process of collecting, integrating and maintaining the accuracy of return execution information necessary to plan the recovery of supply chain resources.

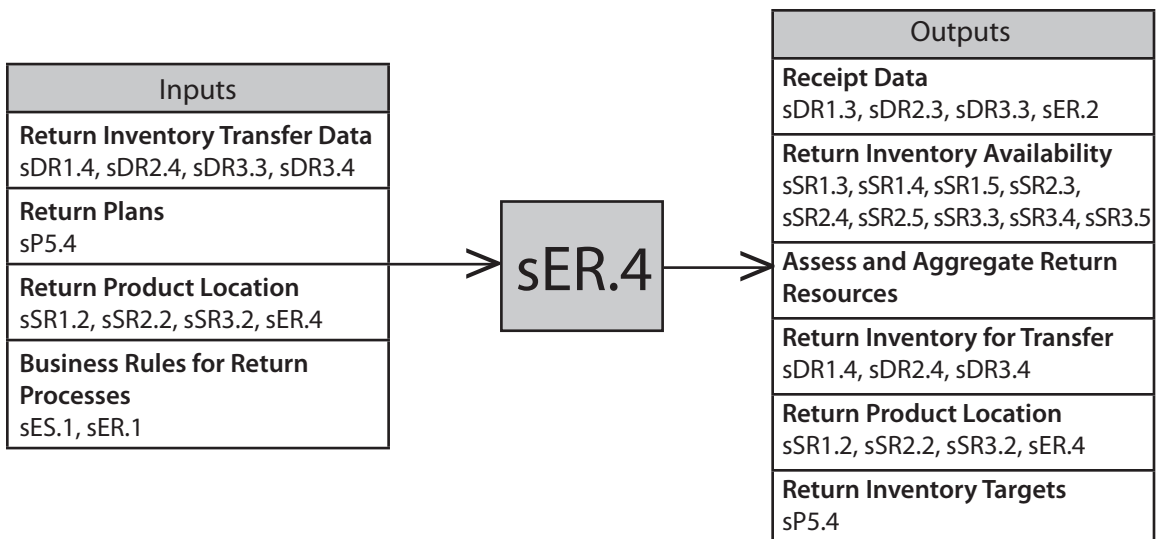
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Return Data Collection Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Return Data Collection
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Automated Update of Customer Excess Material Return Transaction History	<ul style="list-style-type: none"> Use trend analysis to influence inventory level decisions. Web-based alerts to identify update occurred and when pre-determined thresholds are exceeded.
Data Accessibility across the Enterprise for Visibility by Discrete Business Units	Web based access to various levels of enterprise data



Manage Return Inventory

The process of establishing a return process inventory strategy and planning the recovery process inventory limits or levels (including Raw Material, Work In Process, Finished and Purchased Finished Goods) including replenishment models, ownership, product mix, and stocking locations, both inter and intra company.

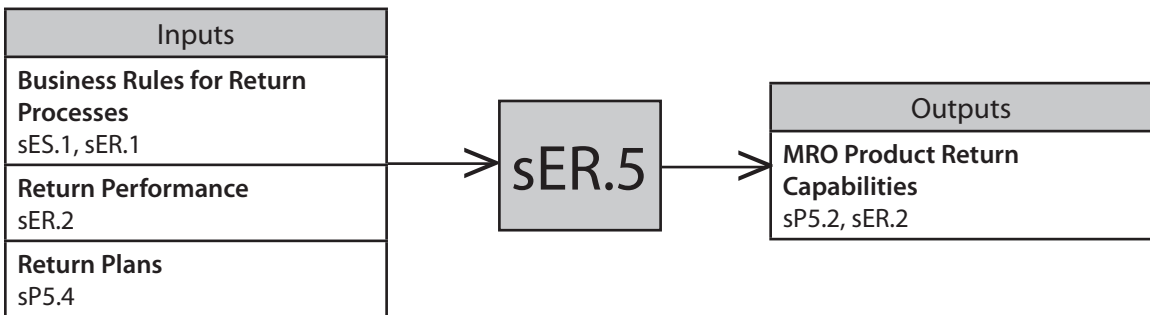
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Return Inventory Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Return Inventory
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Unique Identifier Tag for Each Repairable Asset	Asset management software using bar code, RFI tag, etc.
Periodic Review of Metrics and Strategy with Comparisons to Industry Benchmarks	Real time view of data.
Statistical Test Count	The Statistical Test Count (STC) process is a method of validating inventory on-hand values by physically counting and reconciling a statistical sample of the entire inventory population. This sample is then extrapolated across the inventory population, which provides an indicative measure of entire inventory population. Furthermore, with extrapolation the net and gross percentage of error is determined.
Real Time Data on Current Status	Dynamic calculation of safety stock based on actual sales.



Manage Return Capital Assets

The process of acquiring, maintaining and dispositioning capital assets such as fork lift trucks, information systems and equipment in receiving docks that are utilized in support of Return. Management activities would include defining asset requirements, determining resource availability and conducting gap analysis and resolution. The process includes lease-buy and outsourcing decisions.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Return Capital Assets Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Return Capital Assets
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Integrated Transportation Visibility	<ul style="list-style-type: none"> Advanced shipping notices Real time shipping tracking
Automated Disposition Instructions for Returns Based on Data Interchange with Strategic Providers	Advanced planning and scheduling capability coupled with decision support logic.
Outsource If Not a Core Competency	Use 4PL to manage and move.
Automated Data Entry	Scanning with RFID/Bar-codes systems



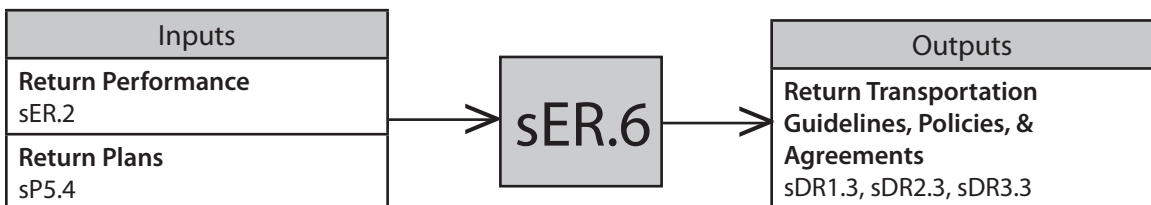
Manage Return Transportation

The process of providing the least cost transportation of a returned product from a customer location to the appropriate service provider location within specified time frames. Can include interim transportation activities conducted within more than one service provider locations. Includes defining and implementing a Return transportation strategy throughout the supply chain, maintaining transportation-related information (rates, lead times) and managing transportation performance.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Return Transportation Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Return Transportation
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Develop Proactive Transit Damage Programs	None Identified
Integrated Order Management, Warehouse Management, and Transportation Management Systems View for analysis for all orders and shipments the following data: Logistics, Product, Cost, GL Charging	Transportation Management System (TMS) Maintenance Management
Automated Documentation for International Shipments	Transportation Management System (TMS) Maintenance Management
Segregate In-Bound Carcass Return Cost from Other Transportation Costs	None Identified
Involve Your Other Supply-Chain Partners If Possible to Leverage Transportation throughout the Chain	Utilization of transportation management system (TMS) to manage returns. Maximization of TMS use, both intra and inter-company within the supply chain.
Electronic Manifest and Electronic Billing	Transportation Management System (TMS) Maintenance Management
Backhaul Trading Exchange	Pooling
Utilize Invoice-less Freight Payment	None Identified
Capture and Maintain Mode Specific Data	Transportation Management System (TMS) Maintenance Management

sER.6

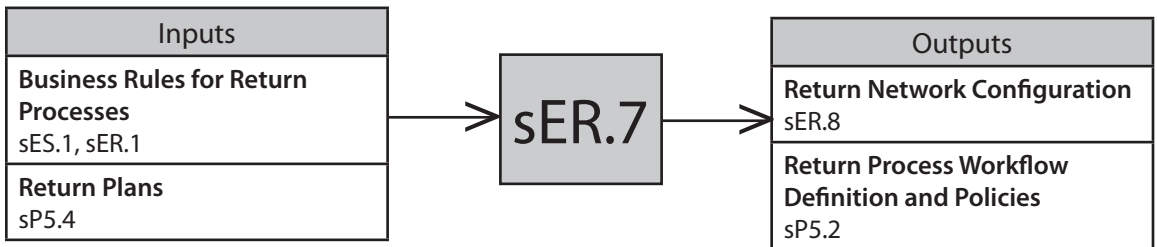
Best Practices cont.	Description/Definition cont.
Limit the Number of Carriers, Treat Them as Partners and Build a Strong Relationship with Each One Geared Toward Continually Improving Service and Lowering Cost	Utilization of transportation management system (TMS) to manage returns. Maximization of TMS use, both intra and inter-company within the supply chain.
Consolidate Shipments Through Cross Docking - Coordinate with Other Shipments	None Identified
Rating & Routing	Internet Pooling (Electronic brokerage of shipments)
Utilize Internet-Based Freight Bidding Built Around Shared Shipping Volume Projections	None Identified
Measurement of Carrier Performance for On-time Delivery and Completeness	Transportation Management System (TMS) Maintenance Management
Appointment Scheduling for Pickup and Delivery of Customer Shipments	Transportation Management System (TMS) Maintenance Management
Real-Time Shipment Tracking, (via internet)	Transportation Management System (TMS) Maintenance Management
Manage Information Across 100% of Shipments	Transportation Management System (TMS) Maintenance Management
Real-Time Optimized Shipment Method Selection (Air Parcel, Ground Parcel, LTL, etc.) Based on Customer Service Requirements	Transportation Management System (TMS) Maintenance Management



Manage Return Network Configuration

The process where customer and service provider locations involved in the flow of returns are defined and maintained throughout the supply chain. Locations include retail and wholesale customer and supplier sites, manufacturing facilities, distribution centers, warehouses, repair depots and military bases. How unserviceable material flow throughout the network is governed by the specific supply chain’s business rules. (See sER1)

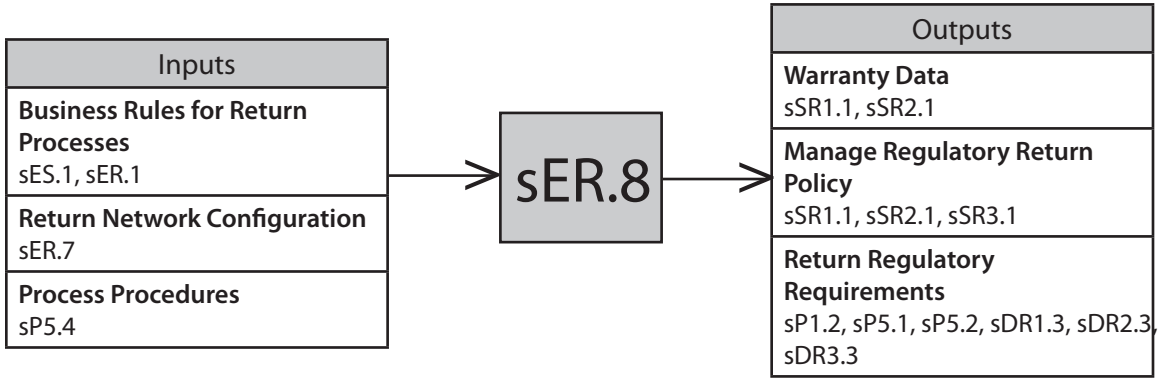
Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Return Network Configuration Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Return Network Configuration
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Service Provider Utilizes Web-Based Communicate to Identify New and Discontinued Repair Sites to Customers	Continuously updated authorized repair sites
Utilize Web-Based Collaboration between Asset Manager and Repair Sites Regarding Capacity and Scheduling	Total return asset visibility throughout the network
Utilize Web-Based Collaboration to Identify Potential New Repair Sites Prior to Their Selection	Shared knowledge of resource availability and bottlenecks
Utilize Web-Based Collaboration between Customer and Service Provider on In-Bound Return Forecasts and Asset Tracking	Shared return forecasts



Manage Return Regulatory Requirements and Compliance

The process of identifying and complying with regulatory documentation and process standards set by external entities (i.e. government, trade officials, etc.) when planning for the Return of Assets. Includes Customs requirements and Import / Export Controls.

Performance Attributes	Metric
Supply Chain Reliability	None Identified
Supply Chain Responsiveness	Manage Return Regulatory Requirements and Compliance Cycle Time
Supply Chain Agility	None Identified
Supply Chain Costs	Cost to Manage Return Regulatory Requirements and Compliance
Supply Chain Asset Management	None Identified
Best Practices	Description/Definition
Confirm All Documentation and Inspection Requirements Before Shipping	None Identified
Compare Local Customs Requirements to Your Process Procedures to Ensure All Requirements Are Accounted for Before Shipping	None Identified
Clarify in Advance If the Product to be Returned Requires Specific, Formal Authorization from the Service Provider per Federal, State or Local Regulation, Prior to Returning	Participants at all customer and service provider locations involved clearly understand all regulatory requirements at each step in the return process .
Note and Communicate Shelf Life Requirements Carefully Before Shipping	Hazardous material regulations are given specific attention.
Clarify in Advance Hazardous Material Packaging, Labeling and Shipping Requirements	Overseas packaging, labeling and shipping regulatory requirements are given specific attention.



Manage Supply Chain Return Risk

The process of managing Return risks within an overall Supply Chain Risk Program. This includes identifying and assessing Return risks as well as and planning and implementing responses to Return risks. Return risks include potential events that could impact you or the customer's ability to Return goods in a timely manner at a reasonable cost with minimal damage. Risk Management includes: mitigation, either reducing the impact of a risk event or reducing the likelihood it will occur.

Performance Attributes	Metric
Supply Chain Reliability	Age of Supplier Risk Data (months), VAR of product/customer performance - , Age of Product / Customer Risk Data (months), VAR of Internal Process Performance, Supplier Mitigation Plans Implemented (percent), VAR of Supplier Performance, Value at Risk (Return)
Supply Chain Responsiveness	External Event Response (average days)
Supply Chain Agility	Internal Event Response (average days), Industry Benchmark Comparison (%), Options Rating (0-100%), Hedge Rating (Inventory DOS for risk management)
Supply Chain Costs	Mitigation cost by Event (\$), Assessment / Risk Management Costs (\$), Mitigation Cost (\$)
Supply Chain Asset Management	Residual Risk (\$), Mitigated Risk (\$), Individual Process Area Event Rating (EVAR) (\$), Supply / Customer / Product Base Rated (%), Gross Risk (\$), Event Risk (EVAR) (\$)
Best Practices	Description/Definition
Supply Chain Risk Identification	A key aspect of supply chain risk management is identification. Identification involves creating a list of potential events that could harm any aspect of the supply chain's performance. Risk identification allows an organization to take steps to create plans to manage risks before they occur. this is typically more cost effective then waiting to react to adverse events when they occur.

Best Practices cont.	Description/Definition cont.
Supply Chain Business Rules Configured to mitigate risk	<p>This practice involves establishing business rules (e.g., customer priority, supplier priority, production routing, transportation routing, etc.) based on minimizing the risk to the supply chain. Under this practice, business rules are established or configured in response to the corporate risk management plan with a goal of reducing either the likelihood of a disruption occurring or the impact to the supply chain should a disruption occur.</p> <p>Business rule reconfiguration typically includes an assessment of the impact of each rule change on the overall supply chain before actual implementation.</p>
Supply Chain Information Configured to Minimize Risk	<p>This practice involves managing supply chain information networks to minimize the risk to the supply chain. This includes information sharing with partners as well as internal locations. This helps all parties to be quickly informed of a real or potential disruption and respond quickly and appropriately to minimize the disruption impact.</p>
Supply Chain Risk Management	<p>Supply chain risk management is the systematic identification, assessment and mitigation of potential disruptions in logistics networks with the objective to reduce their negative impact on the logistics network's performance.</p>
Supply Chain Risk Monitoring	<p>Once areas of risk have been identified, an organization needs to monitor their internal and external environment. This helps them to predict when risky events are becoming more likely. It also helps to identify new risks and is tightly linked to the best practice of Supply Chain Risk Identification.</p>
Risk Management Programs Coordination with Partners	<p>The process of coordinated risk management places a strong emphasis on cooperation among departments within a single company and among different companies of a supply chain to effectively manage the full range of risks as a whole. A closer coordination of risk management activities performed throughout the supply chain is intended to conserve resources and increase effectiveness.</p>

Best Practices cont.	Description/Definition cont.
Supply Chain Network Configured to Mitigate Risk	<p>This practice relies on a risk evaluation of the supply chain to guide the design of the supply chain network. Node locations, transportation routes, capacity size and location, number of suppliers, number of production locations, etc. are all determined in a fashion that mitigates potential disruptions to the ability to deliver product and service to the end customer.</p> <p>This practice relies on the information collected through risk identification and risk assessment processes to identify nodes that are at a high risk of disruption due to the location of the node. Location specific risks can include tactical strike risks, natural disaster risks, single point of failure risks, etc.</p>
Supply Chain Risk Assessment	<p>Supply Chain Risk assessment provides management with an understanding of where the greatest risks may exist in order to prioritize resources for risk mitigation and management. Performing such assessments will involve clarifying the nature of the risk, understanding conditions that may lead to the event, knowing how frequently such events have happened or can be expected to happen, and the potential impact of such events. the team can then prioritize addressing the risks.</p>
Crisis Communications Planning	<p>Open communication is necessary for effective risk management, where the term “open” refers to the possibility to directly reach the right person – who can better handle the information about a crisis situations – wherever in the organization.</p> <p>Managers require direct communication channels up, down and across their business units to help identify risks and take appropriate actions.</p>



Input/Output	Definition	Process
Actual Sales History	Amount of past sales spanning any specified period of time (weeks, months, years, etc.) and expressed in any specified increments (per day, week, month, year, etc.)	sD2.2: Receive, Configure, Enter and Validate Order sD1.2: Receive, Enter and Validate Order sD3.3: Enter Order, Commit Resources Launch Program sP5.1: Assess and Aggregate Return Requirements
Actual Shrink	Reductions of actual quantities of items in stock, in process, or in transit. The loss may be caused by scrap, theft, deterioration, evaporation, etc.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Advanced Ship Notice	An EDI notification of shipment of product.	sD2.11: Load Product & Generate Shipping Documentation sD2.13: Receive and Verify Product by Customer
Air, Ground, Carrier Rate Tables	Rates charged by common carriers to move goods, or freight.	sED.6: Manage Transportation
Approved Contract	Acceptance of an agreement between two or more competent persons or companies to perform or not to perform specific acts or services or to deliver merchandise. A contract may be oral or written.	sD3.2: Negotiate and Receive Contract sD3.3: Enter Order, Commit Resources Launch Program
Approved Item Master	The "master" record for an item. Typically, it contains identifying and descriptive data and control values (lead times, lot sizes, etc.) and may contain data on inventory status, requirements, planned orders, and costs. Item records are linked by bill of material records (or product structure records), thus defining the bill of material.	sED.5: Manage Deliver Capital Assets
Assess and Aggregate Return Resources		sER.4: Manage Return Inventory
Assorted by Shelf Order	The function of physically separating a homogeneous subgroup from a heterogeneous population of items	sD4.3: Pick Product from Backroom
Authorization to Return to Service	Permission to return to service an item that has been repaired and found to be within specifications and operable.	sSR3.2: Disposition Excess Product sSR2.2: Disposition MRO Product sD1.8: Receive Product from Source or Make sSR1.2: Disposition Defective Product
Authorization to Scrap	Permission to scrap material or item outside of specifications and possessing characteristics that make rework impractical.	sSR2.2: Disposition MRO Product sSR3.2: Disposition Excess Product sSR1.2: Disposition Defective Product sD1.8: Receive Product from Source or Make

Inputs/Outputs

Input/Output	Definition	Process
Available to Promise Date	The uncommitted portion of a company's inventory and planned production maintained in the master schedule to support customer-order promising. The ATP quantity is the uncommitted inventory balance in the first period and is normally calculated for each period in which an MPS receipt is scheduled. In the first period, ATP includes on-hand inventory less customer orders that are due and overdue	sD2.3: Reserve Inventory and Determine Delivery Date
Benchmark Data	A set of measurements (or metrics) that is used to establish goals for improvements in processes, functions, products, and so on Benchmark measures are often derived from other firms that display "best in class" achievement	sED.2: Assess Delivery Performance
Bill of Materials	The Bill of Materials is a structured list of all the materials or parts needed to produce a particular finished product, assembly, subassembly, manufactured part, whether purchased or not.	sP2.1: Identify, Prioritize and Aggregate Product Requirements sP3.1: Identify, Prioritize and Aggregate Production Requirements sEP.7: Manage Planning Configuration
Booked Order	The process of accepting and translating what a customer wants into terms used by the manufacturer or distributor. The commitment should be based on the available-to-promise line (ATP) in the master schedule. This can be as simple as creating shipping documents for finished goods in a make-to-stock environment, or it might be a more complicated series of activities, including design efforts for make-to-order products	sED.3: Manage Deliver Information sD2.3: Reserve Inventory and Determine Delivery Date sD2.2: Receive, Configure, Enter and Validate Order
Budget Constraints	A plan that includes an estimate of future costs and revenues related to expected activities. The budget serves as pattern for and a control over future operations.	sEP.10: Align Supply Chain Unit Plan with Financial Plan sP5.2: Identify, Assess, and Aggregate Return Resources
Budgets	A plan that includes an estimate of future costs and revenues related to expected activities. The budget serves as a pattern for and a control over future operations.	sEM.5: Manage Make Equipment and Facilities sED.7: Manage Product Life Cycle sED.5: Manage Deliver Capital Assets

Input/Output	Definition	Process
Business Plan	A document resulting from a process of linking the long-range strategy with projections of revenue, activity, cost and profit. This process develops objectives usually accompanied by budgets, projected balance sheet, and a cash flow statement.	sEP.10: Align Supply Chain Unit Plan with Financial Plan sEM.1: Manage Production Rules sEP.1: Manage Business Rules for Plan Processes sEM.2: Manage Production Performance
Business Rules for Return Processes	Rules for conducting business, i.e. developing and maintaining customer and channel performance standards of an return processes such as service levels, given service requirements by supply chain stakeholders/trading partners. Business rules align Return process policies with business strategy, goals, and objectives.	sER.1: Manage Business Rules for Return Processes sP5.2: Identify, Assess, and Aggregate Return Resources sER.4: Manage Return Inventory sSR3.1: Identify Excess Product Condition sER.7: Manage Return Network Configuration sDR1.1: Authorize Defective Product Return sSR2.1: Identify MRO Product Condition sES.7: Manage Supplier Network sES.1: Manage Sourcing Business Rules sER.8: Manage Return Regulatory Requirements and Compliance sSR1.1: Identify Defective Product Condition sDR2.1: Authorize MRO Product Return sP5.1: Assess and Aggregate Return Requirements sDR3.1: Authorize Excess Product Return sER.5: Manage Return Capital Assets
Business Rules for Source Processes	Rules that are translated into guidelines and policies for conducting business within the enterprise and other legal entities. Sourcing business rules include: supplier selection and negotiation processes, fulfillment and delivery performance and relationship definition for specific levels of collaboration and partnership.	sES.1: Manage Sourcing Business Rules sS3.2: Select Final Supplier (S) and Negotiate sS3.1: Identify Sources of Supply sES.4: Manage Product Inventory
Capacity Constraints	A capacity constraint is said to exist when the available capacity at a resource may be insufficient to meet the workload necessary to support the desired throughput. A capacity constraint is often a bottleneck.	sEP.4: Manage Integrated Supply Chain Inventory sEP.6: Manage Integrated Supply Chain Transportation sEP.5: Manage Integrated Supply Chain Capital Assets

Inputs/Outputs

Input/Output	Definition	Process
Capacity Requirements	The resources needed to produce the projected level of work required from a facility over a time horizon. Capacity requirements are usually expressed in terms of hours of work or, when units consume similar resources at the same rate, units of production.	sEM.6: Manage Transportation (WIP) sEM.4: Manage In-Process Products (WIP)
Capital Assets	Physical objects that are held by an organization for its production potential and that costs more than some threshold value (APICS)	sES.5: Manage Capital Assets sES.8: Manage Import/Export Requirements (Source)
Carrier Contracts (Customer)	Contracts that customers have with specific freight carriers through which suppliers have to work for the delivery of products. Customer manages carrier selection, shipment of purchased product, and payment of carrier.	sED.2: Assess Delivery Performance
Completed Proposal	A document submitted in response to the a request for proposal from a customer with all the terms and conditions of sale of a product or service	sD3.1: Obtain and Respond to RFP/RFQ sD3.2: Negotiate and Receive Contract
Configuration Rules	The rules for the management of product configuration, which includes the management of critical sub processes needed to manage the life cycle of individual item numbers including item masters, routings, rationalization, and bill of materials.	sD2.2: Receive, Configure, Enter and Validate Order sED.1: Manage Deliver Business Rules sED.1: Manage Deliver Business Rules
Conformance Plan	Courses of action and processes that are established to meet the requirements placed on production by external entities.	sEM.8: Manage Make Regulatory Environment
Conformance Rules	An affirmative indication or judgment that a product or service has met criteria translated into rules for meeting external regulatory requirements	sEM.8: Manage Make Regulatory Environment
Consistently High Adoption Rates	Indication of product and service quality, i.e. customer satisfaction.	sD4.7: Deliver and/or Install
Consolidated Orders	The process of analyzing orders to determine the groupings that result in least cost/best service fulfillment and transportation.	sD2.4: Consolidate Orders sD2.5: Build Loads

Input/Output	Definition	Process
Continuous Improvement Process	A process that identifies opportunities for performance improvement and facilitates their realization through the use of metrics, process development methodologies/approaches, project management principles, and reporting tools that support strategic and business plans.	sEP.2: Manage Performance of Supply Chain
Contract Carrier Rates	The rates charged by a carrier that does not serve the general public, but provides transportation for hire for one or a limited number of shippers under a specific contract.	sD.6: Manage Transportation sES.6: Manage Incoming Product sES.8: Manage Import/Export Requirements (Source)
Contract Status	Customer profile, which include address data, credit and purchase histories, customer preferences including shipping, status, and delivery requirements, etc.	sD2.2: Receive, Configure, Enter and Validate Order sED.3: Manage Deliver Information sD3.1: Obtain and Respond to RFP/RFQ sD1.2: Receive, Enter and Validate Order
Contract Terms	All the provisions and agreements of a contract.	sD2.2: Receive, Configure, Enter and Validate Order
Contractual Obligations	A promise in a contract that binds one to a specific course of action. These promises maybe made by either the buyer of seller.	sP5.1: Assess and Aggregate Return Requirements
Corporate Objectives and Strategies	Corporate objectives are the goals and mission of an organization.	sEM.2: Manage Production Performance sEM.8: Manage Make Regulatory Environment sEM.1: Manage Production Rules
Cost to Produce	The cost to produce and item during a given period of time.Includes: the amount of direct materials, direct labor, and allocated overhead.	sEM.7: Manage Production Network
Credit/ Exchange Options	The options available on the return of a repairable item, credit for the cost of the item, repair of the repairable item, receipt of a serviceable item from stock.	sSR3.4: Schedule Excess Product Shipment sSR2.3: Request MRO Return Authorization sSR2.4: Schedule MRO Shipment sSR3.3: Request Excess Product Return Authorization sSR1.4: Schedule Defective Product Shipment sSR1.3: Request Defective Product Return Authorization

Inputs/Outputs

Input/Output	Definition	Process
Credit History	Report that portrays a potential customer's payment history and debt, indicating the ability to pay in a timely manner in the future.	sD2.2: Receive, Configure, Enter and Validate Order sD2.2: Receive, Configure, Enter and Validate Order sED.3: Manage Deliver Information sD3.1: Obtain and Respond to RFP/RFQ sD1.2: Receive, Enter and Validate Order
Current Inventory Source Data	Data which will provide measurement of actual supplier performance against internal and or external standards to provide feedback to achieve and maintain the performance required to meet the customer's needs.	sS3.2: Select Final Supplier (S) and Negotiate sES.3: Maintain Source Data sED.7: Manage Product Life Cycle sES.7: Manage Supplier Network sS3.1: Identify Sources of Supply
Customer Address Data	Customer profile, which include address data, credit and purchase histories, customer preferences including shipping, status, and delivery requirements, etc.	sD3.1: Obtain and Respond to RFP/RFQ sED.3: Manage Deliver Information sD2.2: Receive, Configure, Enter and Validate Order D1.2: Receive, Enter and Validate Order
Customer Data (preference)	Customer profile, which includes history, customer preferences, status, and delivery requirements, etc.	sD4.5: Fill Shopping Cart
Customer Inquiry	General customer inquiries for information concerning products, availability, cost, and requests for quotes.	sD1.1: Process Inquiry and Quote sD2.1: Process Inquiry and Quote
Customer Loyalty / Recurring Visits	Input to customer profile, frequency of visits, recurring, time frame, what purchased, numbers and rings. Measure of customer satisfaction with products and service.	sD4.6: Checkout
Customer Master Database/Up to Date	This database contains all information relative to customers as a group or singly and is updated when ever new information is received about a customer, includes customer profiles.	sED.4: Manage Finished Goods Inventories sED.3: Manage Deliver Information
Customer Order	An order from a customer for a particular product or a number of products. It is often referred to as an actual demand to distinguish it from a forecasted demand.	sD3.3: Enter Order, Commit Resources Launch Program sD3.4: Schedule Installation sD3.2: Negotiate and Receive Contract sD1.2: Receive, Enter and Validate Order sD2.3: Reserve Inventory and Determine Delivery Date sED.2: Assess Delivery Performance
Customer Order Size, Weight, and Freight Class	Coupled with cube and route, these criteria determine type of carrier and cost of shipment	sED.6: Manage Transportation sD2.2: Receive, Configure, Enter and Validate Order sD3.2: Negotiate and Receive Contract

Inputs/Outputs

Input/Output	Definition	Process
Customer Profile/Data	Customer profile, which includes history, customer preferences, status, and delivery requirements, etc.	sD4.6: Checkout
Customer Quote	A statement of price, terms of sale, and description of goods or services offered by a supplier to a prospective purchaser; a bid. When given in response to an inquiry, it is usually considered an offer to sell.	sD1.1: Process Inquiry and Quote sD1.2: Receive, Enter and Validate Order
Customer Replenish Signal	Replenish Signal	sD1.2: Receive, Enter and Validate Order
Customer Requirements	The part of the supply chain requirements related to the customer's needs, including sales forecasts and actual orders and backorders	sP1.1: Identify, Prioritize and Aggregate SC Requirements
Customer Service Requirements	Supply chain requirements related to the customer's needs, including service requirements, sales forecasts and actual orders/backorders.	sED.2: Assess Delivery Performance sED.6: Manage Transportation
Daily Replenishment Requirements	Resources needed to meet Item stocking schedule requirement.	sD4.1: Generate Stocking Schedule sS1.4: Transfer Product
Daily Shipment Volume	Daily Shipment Volume categorized by customer, source, traffic lane, carrier, etc.	sD1.5: Build Loads sD1.4: Consolidate Orders
Data About Return Capabilities	Information required in the process of integrating and maintaining the accuracy of return execution.	sP5.2: Identify, Assess, and Aggregate Return Resources sER.3: Manage Return Data Collection
Data Cleansing Procedure	The procedure that outlines the cleansing of return data to insure its validity and accuracy during the return process.	sER.3: Manage Return Data Collection
Data System Requirements	List of requirements of the data system that insure cleansed data is compatible and usable, or the data system requirements to fully automate the return process.	sER.3: Manage Return Data Collection
DC/Vendor Lead Time	The amount of time that normally elapses between the time an order is received and the time the order is shipped.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
DC/Vendor Transit Time	A standard allowance that is assumed on any given order for the movement of items from one operation to the next.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Defective Product Disposition Request	The customer request for disposition instructions for a defective product from the appropriate source.	sDR1.1: Authorize Defective Product Return sSR1.3: Request Defective Product Return Authorization

Inputs/Outputs

Input/Output	Definition	Process
Defective Product Return Authorization Request	The customer request for disposition instructions for a defective product from the appropriate source.	sDR1.1: Authorize Defective Product Return SR1.3: Request Defective Product Return Authorization
Defective Product Return Authorization Response	The approved or disapproved Return Product Authorization (RPA) for excess inventory, unserviceable products and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract.	sR1.3: Request Defective Product Return Authorization sDR1.1: Authorize Defective Product Return
Defective Products	Maintenance, Repair and Overhaul spare parts used to support of operations and maintenance.	sS1.2: Receive Product sS2.2: Receive Product sDR1.4: Transfer Defective Product
Deliver Contract Terms	Deliver Contract Terms	sD1.2: Receive, Enter and Validate Order
Delivered End Items	Products that have been acknowledged as received by the customer.	sD2.11: Load Product & Generate Shipping Documentation sD1.11: Load Vehicle & Generate Shipping Docs
Deliver Return Requirements	A determination or projection of the requirements the supply chain must meet in the handling and execution of returns. (i.e. quantity, mix, timing)	sP5.4: Establish and Communicate Return Plans sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sP4.2: Identify, Assess and Aggregate Delivery Resources
Delivery Date	Those stocks or items on hand used to support production (raw materials and work in process items), supporting activities (maintenance, repairs and operating supplies), and customer service (finished goods and spare parts). Determination of the time required from the receipt of the order until the item should be delivered.	sD2.4: Consolidate Orders sD1.3: Reserve Inventory and Determine Delivery Date sD1.4: Consolidate Orders sD2.3: Reserve Inventory and Determine Delivery Date
Delivery Performance	The process of measuring actual supplier performance against internal and/or external standards, providing feedback to achieve and maintain the performance required to meet the customers' business and/or competitive needs.	sED.2: Assess Delivery Performance sED.5: Manage Deliver Capital Assets sED.6: Manage Transportation sED.4: Manage Finished Goods Inventories

Input/Output	Definition	Process
Delivery Plans	A plan for a course of action over specified time periods that involves a projected appropriation of supply resources to meet delivery requirements.	sD3.3: Enter Order, Commit Resources Launch Program sP3.1: Identify, Prioritize and Aggregate Production Requirements sD2.3: Reserve Inventory and Determine Delivery Date sP5.2: Identify, Assess, and Aggregate Return Resources sD1.3: Reserve Inventory and Determine Delivery Date sP1.2: Identify, Prioritize and Aggregate SC Resources sP4.4: Establish Delivery Plans sM2.5: Stage Finished Product sM3.6: Stage Finished Product sP2.1: Identify, Prioritize and Aggregate Product Requirements sP5.1: Assess and Aggregate Return Requirements sM1.5: Stage Product
Delivery Requirements	As a whole with constituent parts, all sources of demand in the delivery of a product or service.	sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Delivery Resources and Capabilities	As a whole with constituent parts, all things that add value in the delivery of a product.	sP4.2: Identify, Assess and Aggregate Delivery Resources sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements
Duty Drawback Claims	Claims for the refund of duties as a result of a ruling by the a government agency.	sED.8: Manage Import/Export Requirements
Engineering Design	Final drawings, specifications, formulas, part programs, etc.that describe requirements of a product. The design process consists of translating a set of functional requirements into an operational product, process, or service.	sM3.1: Finalize Production Engineering
Enterprise Distribution Model	Model of the distribution enterprise including the flows, processes, inputs, outputs, metrics, and best business practices.	sED.7: Manage Product Life Cycle
EOQ/ESQ's	Economic Order Quantity - Result of a calculation that determines the most cost effective to quantity to order or produce. Economic Shipping Quantity - Result of a calculation that determines the most cost effective quantity to ship.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements

Inputs/Outputs

Input/Output	Definition	Process
Equipment and Facilities Characteristics	Equipment and facility traits and specifications required to meet external entities requirements.	sEM.8: Manage Make Regulatory Environment
Equipment and Facilities Maintenance History	The process of documenting of the timing and maintenance of equipment and facilities including required repairs, alterations, calibration, servicing, replacement of parts and other miscellaneous items to maintain production capability of the manufacturing fixed asset base	sEM.5: Manage Make Equipment and Facilities
Equipment and Facilities Monitoring Information	Data gathered by measuring, examining, testing, or gauging one or more characteristics of equipment and facilities and comparing it to planned.	sEM.5: Manage Make Equipment and Facilities
Equipment and Facilities Replacement and Disposition Plans	Actions relating to the planning, financing and disposition of capital outlays for such purposes as the purchase of new equipment, the introduction of new product lines, and the modernization of plant facilities	sEM.5: Manage Make Equipment and Facilities sEM.6: Manage Transportation (WIP) sP3.2: Identify, Assess and Aggregate Production Resources
Equipment and Facilities Schedules and Plans	Time-phased plans of present and future load (capacity required) on all resources (Equipment and Facilities) based on the planned and released supply authorizations (i.e., orders) and the planned capacity (capacity available) of these resources over a span of time.	sM1.1: Schedule Production Activities sM2.1: Schedule Production Activities sEM.5: Manage Make Equipment and Facilities sM3.2: Schedule Production Activities
ETO Proposal	A proposal that may contain final drawings, specifications, formulas, part programs, etc.that describe requirements of a product	sS3.2: Select Final Supplier (S) and Negotiate
ETO Request for Proposal	A document used to solicit vendor responses when the functional requirements and features are known.	sS3.1: Identify Sources of Supply
ETO Spec or Design	A clear, complete and accurate statement or drawing of the technical requirements of a material, item or service, and of the procedure to determine if the requirements are met.	sS3.1: Identify Sources of Supply
Excess Product Disposition Request	Request disposition instructions for an excess item from the Supplier.	sSR3.3: Request Excess Product Return Authorization sDR3.1: Authorize Excess Product Return

Input/Output	Definition	Process
Excess Product Return Authorization Request	The process of a customer requesting authorization from a service provider, for the return of excess. In addition to discussing the excess, the customer and service provider would discuss enabling conditions such as return replacement or credit, packaging, handling, transportation and import / export requirements to facilitate the efficient return of excess to the service provider. The customer may need to go through several return authorization iterations with multiple service providers before authorization is received.	sDR3.1: Authorize Excess Product Return sSR3.3: Request Excess Product Return Authorization sSR3.3: Request Excess Product Return Authorization
Excess Product Return Authorization Response	The process of a customer obtaining authorization, from a service provider, for the return of excess product	sDR3.1: Authorize Excess Product Return
Excess Products	Material in excess of the current requirements.	sS1.2: Receive Product sS2.2: Receive Product sDR3.4: Transfer Excess Product
Existing Inventory Data	Available data that characterizes and quantifies raw material, work in process, and finished goods inventories	sED.4: Manage Finished Goods Inventories sS1.4: Transfer Product sD1.8: Receive Product from Source or Make sS2.4: Transfer Product sS3.6: Transfer Product sES.4: Manage Product Inventory
External Regulatory Information	Documentation and process standards set by external entities (i.e. government, trade officials, etc.)	sEM.8: Manage Make Regulatory Environment
Finished Goods Inventory Location	The physical storage location where Finished Product inventory is held in stock prior to use or shipment.	sED.4: Manage Finished Goods Inventories sS3.6: Transfer Product sS1.4: Transfer Product sS2.4: Transfer Product
Finished Product Release	The authorization to ship a finished product that has been ordered.	sM3.7: Release Product to Deliver sD3.9: Pick Product sD4.2: Receive Product at the Store sM2.6: Release Finished Product to Deliver sM1.6: Release Product to Deliver sD1.8: Receive Product from Source or Make sD2.9: Pick Product
Finish Goods Inventory Target Levels	In a min-max inventory system, the equivalent of the maximum. The target inventory is equal to the order point plus a variable order quantity.	sED.4: Manage Finished Goods Inventories sP4.2: Identify, Assess and Aggregate Delivery Resources

Inputs/Outputs

Input/Output	Definition	Process
Full Cart (Empty Cart)	Completion of customer checkout, sale of the selected goods, cart transitions from full to empty.	sD4.6: Checkout
Full Cart Ready for Checkout	Customer selected goods transferred to the point of sale.	sD4.5: Fill Shopping Cart sD4.6: Checkout
Full Shelf Locations	Determination of the best retail locations for implementation of full shelf equipment.	sD4.5: Fill Shopping Cart sD4.4: Stock Shelf
Government Constraints	Requirements established by a government which must be met before allowing the shipping, delivery of a product or manufacture of an item.	sED.8: Manage Import/Export Requirements sED.7: Manage Product Life Cycle
Government Regulations	Documents the implement law and requirements concerning the import and export of items and the manufacture of item.	sED.8: Manage Import/Export Requirements
High Customer Services Satisfaction Levels	Indication of product and service quality.	sD4.7: Deliver and/or Install
Historical Return Rates	A judgmental forecasting technique based upon the a return history that is analogous to a present situation, such as the return history on a similar product, and using the past pattern to predict future returns.	sDR3.1: Authorize Excess Product Return sSR1.3: Request Defective Product Return Authorization sSR3.3: Request Excess Product Return Authorization sSR2.3: Request MRO Return Authorization sDR2.1: Authorize MRO Product Return sP5.1: Assess and Aggregate Return Requirements sDR1.1: Authorize Defective Product Return
Import/Export Requirements	Requirements established by a government or trading areas (i.e EU, NAFTA etc) which must be met before allowing the shipping or delivery of a product across national boundaries.	sES.10: Manage Supplier Agreements sES.5: Manage Capital Assets sES.8: Manage Import/Export Requirements sES.6: Manage Incoming Product
Incoming Product Information	Data concerning product on order and due to be delivered to location agreed in the order.	sEM.4: Manage In-Process Products (WIP)

Input/Output	Definition	Process
Information Feedback	The flow of information back into the control system so that actual performance can be compared with planned performance.	sM3.4: Produce and Test sM3.7: Release Product to Deliver sM3.6: Stage Finished Product sM1.4: Package sM2.4: Package sM1.3: Produce and Test sM3.5: Package sM3.3: Issue Sourced/In-Process Product sM1.5: Stage Product sM2.2: Issue Sourced/In-Process Product sM2.6: Release Finished Product to Deliver sM3.2: Schedule Production Activities sM2.3: Produce and Test sM1.1: Schedule Production Activities sM2.1: Schedule Production Activities sM2.5: Stage Finished Product sM1.2: Issue Material sM1.6: Release Product to Deliver
Information from Business Processes	Data arranged or presented from a set of logically related tasks or activities performed to achieve a defined business outcome; so that the data yields an understanding not available from any single data element.	sEM.3: Manage Make Information
Information Infrastructure Plan	A plan outlining the processes required for managing, collecting, maintaining, and communicating information and masterdata to support planning and execution processes.	sEM.3: Manage Make Information
Information Needed to Create and Maintain IT	Interrelated computer hardware and software along with people and processes designed for the collection, processing, and dissemination of information for planning, decision making, and control.	sEM.3: Manage Make Information
Information Needs Analysis	Specifying the inputs, files, processing, business rules and outputs for a new system, but without expressing computer alternatives and technical details.	sEM.3: Manage Make Information
Installed Product	The process of preparing, testing and installing the product at the customer site. The standalone product is fully functional upon completion, but there may be requirement for subsequent integration.	sD1.14: Install Product sD2.15: Invoice sD1.15: Invoice sD3.14: Install Product sD2.14: Install Product

Inputs/Outputs

Input/Output	Definition	Process
Integrated Supply Chain Inventory Information	Managing the flow of raw materials and products in a supply chain based on uncertain demand for the finished products.	sEP.4: Manage Integrated Supply Chain Inventory sEP.4: Manage Integrated Supply Chain Inventory
Integrated Supply Chain Plan	Communication of courses of action over the appropriate time-defined planning horizon and interval, representing a projected appropriation of supply chain resource and input material to meet supply-chain requirements as they affect the customer.	sED.4: Manage Finished Goods Inventories
Internal Adjustments		sEM.9: Manage Supply Chain Make Risk sES.9: Manage Supply Chain Source Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk sEP.9: Manage Supply Chain Plan Risk
Internal Capacity	The organic capability of an organization to produce output per time period.	sEM.7: Manage Production Network
Internal Information		sES.9: Manage Supply Chain Source Risk sEM.9: Manage Supply Chain Make Risk sEP.9: Manage Supply Chain Plan Risk sED.9: Manage Supply Chain Deliver Risk sER.9: Manage Supply Chain Return Risk
Inventory	In business management, inventory consists of a list of goods and materials held available in stock. Also, those stocks or items used to support production (raw materials and work-in-process items), supporting activities (maintenance, repair, and operating supplies), and customer service (finished goods and spare parts)	sP1.2: Identify, Prioritize and Aggregate SC Resources

Input/Output	Definition	Process
Inventory Availability	Those stocks or items on hand used to support production (raw materials and work in process items), supporting activities (maintenance, repairs and operating supplies), and customer service (finished goods and spare parts).	<p>sM2.2: Issue Sourced/In-Process Product</p> <p>sD2.9: Pick Product</p> <p>sS1.4: Transfer Product</p> <p>sS2.4: Transfer Product</p> <p>sD1.8: Receive Product from Source or Make</p> <p>sD4.3: Pick Product from Backroom</p> <p>sD3.9: Pick Product</p> <p>sD2.3: Reserve Inventory and Determine Delivery Date</p> <p>sP2.2: Identify, Assess and Aggregate Product Resources</p> <p>sM1.2: Issue Material</p> <p>sM3.3: Issue Sourced/In-Process Product</p> <p>sES.4: Manage Product Inventory</p> <p>sS3.6: Transfer Product</p> <p>sM1.2: Issue Material</p> <p>sM2.2: Issue Sourced/In-Process Product</p> <p>sD4.2: Receive Product at the Store</p> <p>sM3.3: Issue Sourced/In-Process Product</p> <p>sD1.3: Reserve Inventory and Determine Delivery Date</p> <p>sP3.2: Identify, Assess and Aggregate Production Resources</p> <p>sD1.9: Pick Product</p> <p>sD4.2: Receive Product at the Store</p> <p>sD1.8: Receive Product from Source or Make</p>
Inventory Availability/ Delivery Date	Those stocks or items on hand used to support production (raw materials and work in process items), supporting activities (maintenance, repairs and operating supplies), and customer service (finished goods and spare parts). Determination of the time required from the receipt of the order until the item should be delivered.	<p>sP4.2: Identify, Assess and Aggregate Delivery Resources</p> <p>sD1.3: Reserve Inventory and Determine Delivery Date</p> <p>sD2.3: Reserve Inventory and Determine Delivery Date</p>
Inventory Capacity	Maximum rate of output for the inventory management and warehouse process	<p>sEM.2: Manage Production Performance</p> <p>sEM.1: Manage Production Rules</p>
Inventory in Stock	Stored products or service parts ready for sale, as distinguished from stores, which are usually components or raw materials.	sD4.3: Pick Product from Backroom
Inventory Rules	The rules that determining the desired levels of items, whether raw materials, work in process, or finished products including order quantities and safety stock levels.	<p>sED.4: Manage Finished Goods Inventories</p> <p>sED.4: Manage Finished Goods Inventories</p> <p>sED.5: Manage Deliver Capital Assets</p>

Inputs/Outputs

Input/Output	Definition	Process
Inventory Status	A periodic report showing the inventory on hand and usually showing the inventory on order and some sales or usage history for the products that are covered in the stock status report.	sD2.3: Reserve Inventory and Determine Delivery Date
Inventory Strategy	The total supply chain inventory strategy. Contains the plan for total inventory limits or levels (including Raw Material, Work In Process, Finished and Purchased Finished Goods) including replenishment models, ownership, product mix, and stocking locations, both inter and intra company.	sEP.4: Manage Integrated Supply Chain Inventory sP1.3: Balance Supply Chain Resources with SC Requirements sP5.2: Identify, Assess, and Aggregate Return Resources
Item Master	A record of specific information for each product, which defines the system parameters with which to effectively plan and execute using ERP (MRP, etc) systems.	sP2.1: Identify, Prioritize and Aggregate Product Requirements sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sP5.1: Assess and Aggregate Return Requirements sP3.1: Identify, Prioritize and Aggregate Production Requirements sEP.7: Manage Planning Configuration
Item Pick Sheet for Stocking Schedule	A document that lists the material to be picked to meet the schedule for the planned movement of material from a bulk storage area to an order pick storage area.	sD4.2: Receive Product at the Store sD4.3: Pick Product from Backroom
Item Stocking Requirements	The activities and techniques of determining the desired levels of items, whether raw materials, work in process, or finished products. Demand for inventory maybe dependant or independent. Inventory functions are anticipation, hedge, cycle (lot size), fluctuation (safety, buffer or reserve), transportation (pipeline), an service parts.	sD4.2: Receive Product at the Store sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Load, Shipping, Verify, and Credit Information	The function that performs tasks for the outgoing shipment of parts, components, and products. It includes packaging, marking, weighing, and loading for shipment. Also, verify the shipment and customer credit information.	sSR2.5: Return MRO Product sSR1.5: Return Defective Product sSR3.5: Return Excess Product sD1.11: Load Vehicle & Generate Shipping Docs
Loaded Retail Cart or Pallet	Customer selected retail finished goods transferred to the point of sale.	sD4.3: Pick Product from Backroom sS1.4: Transfer Product sD4.4: Stock Shelf

Input/Output	Definition	Process
Load Information	Information relative to a load that is built and shipped, i.e. customer, items, destinations, weight, etc	sP4.2: Identify, Assess and Aggregate Delivery Resources sD3.5: Build Loads sD2.6: Route Shipments sD2.5: Build Loads sD1.6: Route Shipments sD1.5: Build Loads sD3.6: Route Shipments
Location of Customers	Customer profile, which includes address and location data, credit and purchase histories, customer preferences including shipping, status, and delivery requirements, etc.	sD2.2: Receive, Configure, Enter and Validate Order sD1.2: Receive, Enter and Validate Order sED.7: Manage Product Life Cycle sD3.2: Negotiate and Receive Contract
Logistics Selection	Carrier selection and management for inbound or outbound shipments (linked to terms of delivery)	sES.6: Manage Incoming Product sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries sS1.1: Schedule Product Deliveries
Lost or Dropped Shopping Carts	On-line orders that are missing due to internet, software, or hardware malfunctions.	sD4.5: Fill Shopping Cart
Low Rates of Failure	Indication of quality in workmanship and design.	sD4.7: Deliver and/or Install
Loyalty Customer Profile Changes	More units, higher average ring, etc.	sD4.6: Checkout
Make/Buy Decision	The output of the process used to determine whether a demand will be supplied with internal capacity or purchased through contract manufacturing and/or contracted services externally.	sP5.2: Identify, Assess, and Aggregate Return Resources sP1.2: Identify, Prioritize and Aggregate SC Resources sEP.5: Manage Integrated Supply Chain Capital Assets
Manage Integrated Supply Chain Inventory Information	Managing the flow of raw materials and products in a supply chain based on uncertain demand for the finished products	sDR3.1: Authorize Excess Product Return sDR1.1: Authorize Defective Product Return sDR2.1: Authorize MRO Product Return sDR1.1: Authorize Defective Product Return sDR3.1: Authorize Excess Product Return sDR2.1: Authorize MRO Product Return
Management Process Reports	Reports which provide management with the process information required to evaluate prescribed activities to ensure that the stated objectives of a project, manufactured good, or service are achieved.	sED.2: Assess Delivery Performance sED.1: Manage Deliver Business Rules

Inputs/Outputs

Input/Output	Definition	Process
Manage Regulatory Return Policy	The process of identifying and complying with regulatory documentation and process standards set by external entities (i.e. government, trade officials, etc.) when planning for the Return and Recovery of Assets.	sSR2.1: Identify MRO Product Condition sSR1.1: Identify Defective Product Condition sER.8: Manage Return Regulatory Requirements and Compliance sSR3.1: Identify Excess Product Condition
Manufacturer's Recommended Maintenance Schedules & Specifications	The scheduled activities, including adjustments, replacements, and basic cleanliness, that are recommended by the manufacturer to forestall machine breakdowns.	sEM.5: Manage Make Equipment and Facilities
Markdown Plans	Part of the Market Plan, which establishes an allowance or deduction, granted by the seller to the buyer, usually when the buyer meets certain stipulated conditions that reduce the price of the products purchased. For example, based upon paying early, buying in quantity, etc.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Merchandise Category/ Classification	The categorization of goods based upon the range of specifications met during the manufacturing process.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Merchandising Plan	The merchandising plan includes the current market position, opportunity and issue analysis, merchandising objectives and strategies, action plans, programs, projects, budgets, and pro forma profit and loss statement and management controls.	sD4.5: Fill Shopping Cart
Methods, Procedures, Processes	Methods, procedures and processes required to produce distinct items, such as parts that retain their identity through the transformation process and are intended to be completed after receipt of a customer order, including custom products that are designed, developed, and produced in response to a specific customer request.	sM3.2: Schedule Production Activities sM3.1: Finalize Production Engineering
Monitoring		sEM.9: Manage Supply Chain Make Risk sER.9: Manage Supply Chain Return Risk sES.9: Manage Supply Chain Source Risk sED.9: Manage Supply Chain Deliver Risk sEP.9: Manage Supply Chain Plan Risk
MRO Disposition Request	Request disposition instructions for an MRO item from the Supplier.	sDR2.1: Authorize MRO Product Return sSR2.3: Request MRO Return Authorization

Input/Output	Definition	Process
MRO Parts Availability	The on-hand MRO inventory balance minus allocations, reservations, backorders, and (usually) quantities held for quality problems.	sEM.5: Manage Make Equipment and Facilities sES.4: Manage Product Inventory
MRO Product Return Capabilities	See "Product Return Capabilities"	sP5.2: Identify, Assess, and Aggregate Return Resources sER.2: Manage Performance of Return Processes sER.5: Manage Return Capital Assets sER.2: Manage Performance of Return Processes
MRO Products	Maintenance, Repair and Overhaul spare parts used to support of operations and maintenance.	sS1.2: Receive Product sS2.2: Receive Product sDR2.4: Transfer MRO Product
MRO Return Authorization Request	The process of a customer requesting authorization from a service provider, for the return of an MRO product. In addition to discussing the MRO issue, the customer and service provider would discuss enabling conditions such as return replacement or credit, packaging, handling, transportation and import / export requirements to facilitate the efficient return of the MRO product to the service provider. The customer may need to go through several return authorization iterations with multiple service providers before authorization is received.	sSR2.3: Request MRO Return Authorization sDR2.1: Authorize MRO Product Return
MRO Return Authorization Response	The process of a customer obtaining authorization, from a service provider, for the return of an MRO product	sDR2.1: Authorize MRO Product Return sSR2.3: Request MRO Return Authorization
On-demand Replenishment Requirements	Requirements for the triggering of material movement to a work center only when that work center is ready to begin the next job.	sD4.1: Generate Stocking Schedule
On-Order/Backorder	An unfilled customer order or commitment. A backorder is an immediate (or past due) demand against an item whose inventory is insufficient to satisfy the demand.	sD4.3: Pick Product from Backroom
Optional Payment	Payment at the time of order, maybe partial or in full.	sD3.2: Negotiate and Receive Contract sD1.2: Receive, Enter and Validate Order sD2.2: Receive, Configure, Enter and Validate Order

Inputs/Outputs

Input/Output	Definition	Process
Order Backlog	Orders that have been received and entered into the order processing system and are in a queue waiting to be processed and shipped.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sD2.3: Reserve Inventory and Determine Delivery Date sP1.1: Identify, Prioritize and Aggregate SC Requirements sD1.11: Load Vehicle & Generate Shipping Docs sD1.3: Reserve Inventory and Determine Delivery Date sD3.3: Enter Order, Commit Resources Launch Program
Order Information	The function encompasses receiving and entering all data necessary on orders, so the order can be finalized and entered into the order system.	sD3.3: Enter Order, Commit Resources Launch Program sM3.1: Finalize Production Engineering
Order Quote (CUSTOMER)	A statement of price, terms of sale, and description of goods or services offered by a supplier to a prospective purchaser; a bid. When given in response to an inquiry, it is usually considered an offer to sell.	sD2.1: Process Inquiry and Quote sD2.2: Receive, Configure, Enter and Validate Order
Order Rules	Rules for the function that encompasses receiving, entering, and promising orders from customers, distribution centers, and interplant operations.	sED.4: Manage Finished Goods Inventories sD2.2: Receive, Configure, Enter and Validate Order sD1.2: Receive, Enter and Validate Order sD3.2: Negotiate and Receive Contract sED.1: Manage Deliver Business Rules sED.5: Manage Deliver Capital Assets
Order Signal	Reserved inventory and/or planned capacity and delivery date for a specific order.	sD2.3: Reserve Inventory and Determine Delivery Date sP2.1: Identify, Prioritize and Aggregate Product Requirements sP3.1: Identify, Prioritize and Aggregate Production Requirements sD3.3: Enter Order, Commit Resources Launch Program
Outsource Plan	A plan that describes how a company will utilize third party business partners to provide products and services which the company chooses not to provide with internal capacity. Outsource Plans can vary in detail from simple policy statements to highly detailed plans with specifics about the third party business partners, specifications for products and services, performance expectations, and contract considerations.	sP1.2: Identify, Prioritize and Aggregate SC Resources sEP.5: Manage Integrated Supply Chain Capital Assets sEP.6: Manage Integrated Supply Chain Transportation sP5.2: Identify, Assess, and Aggregate Return Resources

Inputs/Outputs

Input/Output	Definition	Process
Parts and Services Consumed	The items and services utilized to manufacture a product.	sES.4: Manage Product Inventory sEM.5: Manage Make Equipment and Facilities sES.8: Manage Import/Export Requirements sES.5: Manage Capital Assets
Payment	Receipt of payment for goods and services per contract or purchase order.	sD3.15: Invoice sD2.15: Invoice sD1.15: Invoice
Payment Terms	The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.	sS3.7: Authorize Supplier Payment sS1.5: Authorize Supplier Payment sS2.5: Authorize Supplier Payment sES.10: Manage Supplier Agreements
Plan and Build Loads Information	Transportation modes are selected and efficient loads are built.	sD1.5: Build Loads sSR3.4: Schedule Excess Product Shipment sSR1.4: Schedule Defective Product Shipment sSR2.4: Schedule MRO Shipment
Planning Data	Execution information necessary to plan the balance of supply chain resources to demand requirements at both the highest aggregate and lowest SKU planning levels.	sP2.2: Identify, Assess and Aggregate Product Resources sP1.1: Identify, Prioritize and Aggregate SC Requirements sEM.7: Manage Production Network sEP.3: Manage Plan Data Collection sP5.2: Identify, Assess, and Aggregate Return Resources sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sP3.2: Identify, Assess and Aggregate Production Resources sP3.1: Identify, Prioritize and Aggregate Production Requirements sP1.2: Identify, Prioritize and Aggregate SC Resources sP5.1: Assess and Aggregate Return Requirements sP2.1: Identify, Prioritize and Aggregate Product Requirements sP4.2: Identify, Assess and Aggregate Delivery Resources

Inputs/Outputs

Input/Output	Definition	Process
Planning Decision Policies	Any company policies that affect how a planning process is defined, approved, and performed.	sP1.3: Balance Supply Chain Resources with SC Requirements sED.1: Manage Deliver Business Rules sEP.5: Manage Integrated Supply Chain Capital Assets sEP.1: Manage Business Rules for Plan Processes sP3.3: Balance Production Resources with Production Requirements sP5.3: Balance Return Resources with Return Requirements sEP.4: Manage Integrated Supply Chain Inventory sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements sP2.3: Balance Product Resources with Product Requirements sEP.6: Manage Integrated Supply Chain Transportation
Plan-o-gram Data	Data required to develop and build a Plan-O-Gram display to help minimize setup time by showing specific placement of all items, by product number, on the display.	sD4.4: Stock Shelf
Point of Sale Data (Daily)	The relief of inventory and computation of sales data at the time and place of the sales, generally (may be manual) through the use of bar-coding, or magnetic media and equipment.	sD4.6: Checkout sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Preventative Maintenance and Calibration Schedule	Planned and scheduled activities, including adjustments, replacements, and basic cleanliness, that forestall machine and facility breakdowns. Also, the established frequency to change and maintain parts, based on failure consequences, with frequency set per part or machine type. (Well cared for equipment and facilities will last longer and cause fewer problems.)	sM2.1: Schedule Production Activities sM3.2: Schedule Production Activities sEM.5: Manage Make Equipment and Facilities sM1.1: Schedule Production Activities
Process Procedures	A planned series of actions or operations that advances returns from one stage to another, or established procedures to manage and execute all activities in the process.	sER.2: Manage Performance of Return Processes sER.1: Manage Business Rules for Return Processes sP5.4: Establish and Communicate Return Plans sER.8: Manage Return Regulatory Requirements and Compliance

Input/Output	Definition	Process
Procurement Signal (Supplier)	Any signal that indicates when to produce or transport Items in a pull replenishment system, or the signal that sends the estimated need of parts or services to the supplier.	sS1.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries sS2.1: Schedule Product Deliveries sS3.2: Select Final Supplier (S) and Negotiate
Product	The end object of a transformation process that includes physical objects, information or services.	sD2.2: Receive Product s1.13: Receive and Verify Product by Customer sD2.13: Receive and Verify Product by Customer sD3.14: Install Product sS1.2: Receive Product sD3.13: Receive and Verify Product by Customer sD1.14: Install Product sD2.14: Install Product sS3.4: Receive Product
Product/Category Lifecycle	The time from initial research and development to the time at which the sales and support of the product to customers are withdrawn.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Product Availability	Availability of a product by location that is reserved, scheduled or available for sale, or the number of products ready to be or planned to be shipped to the specific customer or market at the specific time.	sP2.2: Identify, Assess and Aggregate Product Resources
Product Data (linked/ related SKU's)	The properties and characteristics of a product (e.g. the part number and a text description of the product) and the relationships to other items in the product family and linked / related SKU's.	sD4.5: Fill Shopping Cart
Product Design	The product design is the translation of a set of functional requirements into an operational product that meets both the enterprise and customer expectations.	sEM.1: Manage Production Rules
Product Design/Claims	The product design is the translation of a set of functional requirements into an operational product that meets both the enterprise and customer expectations. Claims are marketing information provided as to performance, etc. Claims from the users of the product indicate a need to change the product design	sEM.8: Manage Make Regulatory Environment

Inputs/Outputs

Input/Output	Definition	Process
Product Design/Quality	A product design approach that uses quality measures to capture the extent to which the design meets the needs of the target market (customer attributes), as well as its actual performance, aesthetics, and cost.	sEM.2: Manage Production Performance
Product Inventory Location	The physical storage location where product inventory is held in stock prior to use or shipment.	sS1.4: Transfer Product sES.4: Manage Product Inventory sS3.6: Transfer Product sS2.4: Transfer Product
Product Inventory Target Levels	The target for the total product inventory, including e.g. raw material, work in progress and finished goods.	sES.4: Manage Product Inventory sP2.2: Identify, Assess and Aggregate Product Resources
Production Capacity	The highest, sustainable output rate which can be achieved with the current product specifications, product mix, worker effort, plant, and equipment.	sEP.5: Manage Integrated Supply Chain Capital Assets sEM.1: Manage Production Rules sEM.2: Manage Production Performance
Production Orders Planned & Actual Reports	A statement of the output of a production facility for a specified period, comparing planned to actual production.	sEM.4: Manage In-Process Products (WIP) sEM.6: Manage Transportation (WIP)
Production Plans	A master production plan used to allocate capacity among manufacturing resources and schedule finite manufacturing activities or executing the performance of a service. Production Plan includes production capability.	sP1.2: Identify, Prioritize and Aggregate SC Resources sP3.4: Establish Production Plans sP5.1: Assess and Aggregate Return Requirements sP4.2: Identify, Assess and Aggregate Delivery Resources sM1.1: Schedule Production Activities sEM.2: Manage Production Performance sP5.2: Identify, Assess, and Aggregate Return Resources sD3.3: Enter Order, Commit Resources Launch Program sM3.6: Stage Finished Product sEM.5: Manage Make Equipment and Facilities sM2.1: Schedule Production Activities sM1.5: Stage Product sP2.1: Identify, Prioritize and Aggregate Product Requirements sEM.1: Manage Production Rules sD1.3: Reserve Inventory and Determine Delivery Date sM2.5: Stage Finished Product sM3.2: Schedule Production Activities sD2.3: Reserve Inventory and Determine Delivery Date

Input/Output	Definition	Process
Production Quality & Policies		sEM.2: Manage Production Performance
Production Quality and Policies	The operational techniques and planned and systematic activities used to fulfill requirements for quality in the production process, or the quality of the production, as defined by the company. For example, a percentage of parts produced without a need for adjustment or repair. The production policy indicates standard rules on how the production quality should be secured.	sEM.5: Manage Make Equipment and Facilities
Production Requirements	As a whole with constituent parts, all sources of demand in the creation of a product or service.	sP3.3: Balance Production Resources with Production Requirements
Production Resources	As a whole with constituent parts, all things that add value in the creation of a product or performance of a service.	P3.3: Balance Production Resources with Production Requirements sP3.2: Identify, Assess and Aggregate Production Resources
Production Rules	The rules directing or regulating the movement of goods through the entire manufacturing and repair cycle (parameters of production) from the requisitioning of raw material to the delivery of the finished products.	sEM.2: Manage Production Performance sEM.1: Manage Production Rules

Inputs/Outputs

Input/Output	Definition	Process
Production Schedule	A plan that authorizes the factory to manufacture or repair a certain quantity of a specific item.	sD1.8: Receive Product from Source or Make sM2.2: Issue Sourced/In-Process Product sM1.1: Schedule Production Activities sD3.9: Pick Product sM3.2: Schedule Production Activities sM2.1: Schedule Production Activities sP3.2: Identify, Assess and Aggregate Production Resources sM2.2: Issue Sourced/In-Process Product sD4.2: Receive Product at the Store sS1.1: Schedule Product Deliveries sD2.9: Pick Product sS3.3: Schedule Product Deliveries sD2.3: Reserve Inventory and Determine Delivery Date sM3.3: Issue Sourced/In-Process Product sD1.3: Reserve Inventory and Determine Delivery Date sS2.1: Schedule Product Deliveries sM1.2: Issue Material sD3.3: Enter Order, Commit Resources Launch Program
Production Status	Feedback on the production schedule allowing for corrective action to a production problem, or an indication of how far in the production process a specific part has progressed	sEM.7: Manage Production Network sEM.5: Manage Make Equipment and Facilities
Product Location Information	Attributes of the product's storage location.	sEM.6: Manage Transportation (WIP) sM1.2: Issue Material sM2.2: Issue Sourced/In-Process Product sM3.3: Issue Sourced/In-Process Product
Product Mix and Plans	The proportion of individual products that make up the total production or sales volume and plan that authorizes the factory to manufacture a certain quantity of a specific item, or the portfolio of products the company has to cover the targeted customer need and the plans of how to manage that portfolio.	sED.7: Manage Product Life Cycle sED.4: Manage Finished Goods Inventories
Product On Order	Product on order with a selected source.	sS2.1: Schedule Product Deliveries sES.10: Manage Supplier Agreements sP2.2: Identify, Assess and Aggregate Product Resources sS1.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries sS2.1: Schedule Product Deliveries

Input/Output	Definition	Process
Product Requirements	As a whole with constituent parts, all sources of demand for a product or service in the supply chain.	sP2.1: Identify, Prioritize and Aggregate Product Requirements sP2.3: Balance Product Resources with Product Requirements
Product Return Capabilities	The capability of a system or resources to produce a quantity output in a particular time period; and, any element or factor that constrains the system or resources from achieving a higher level of performance in respect to its goal. The ability the supply chain has to return products in a valid and accurate way.	sDR3.1: Authorize Excess Product Return sP5.4: Establish and Communicate Return Plans sDR1.1: Authorize Defective Product Return sDR2.1: Authorize MRO Product Return
Product Routings	Product routings represent the way products are made and are integrated with the Bill of Materials. Key elements of proper Routings include proper sequence of operations, work center identification, relevant tolerances, run times, lot size and setups. The equivalent concepts for services are the workflow processes and rules.	sP3.1: Identify, Prioritize and Aggregate Production Requirements sEP.7: Manage Planning Configuration sEP.4: Manage Integrated Supply Chain Inventory sEP.6: Manage Integrated Supply Chain Transportation sP2.1: Identify, Prioritize and Aggregate Product Requirements sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sP5.1: Assess and Aggregate Return Requirements sEP.5: Manage Integrated Supply Chain Capital Assets
Product Sources	As a whole with constituent parts, all material and other resources used to add value in the supply chain for a product or services.	sP2.3: Balance Product Resources with Product Requirements sP2.2: Identify, Assess and Aggregate Product Resources
Projected Delivery Requirements	The company's goal for the time to ship the product after the receipt of a customer's order. The policy is sometimes stated as "our quoted delivery time," or an estimate of the customer delivery requirements of a product or service, e.g. which kind of packaging, should the parts be shipped one by one or in bulks etc.	sEM.6: Manage Transportation (WIP) sED.6: Manage Transportation sEM.7: Manage Production Network
Projected Internal and External Capacity	An estimate of the amount of product or service a particular part of the business (internal capacity) or a third party business partner (external capacity) is capable of producing over a particular period of time when all factors that control the production processes are working optimally.	sEP.6: Manage Integrated Supply Chain Transportation sEP.5: Manage Integrated Supply Chain Capital Assets sP5.2: Identify, Assess, and Aggregate Return Resources

Inputs/Outputs

Input/Output	Definition	Process
Promotion/Event Plans	Promotion activities - other than advertising, publicity, and personal selling - that stimulate, interest, trial or purchase by final customers or others in the marketing channel.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Promotional Plan	The plan for a promotional product offering and how it is communicated to the customer and includes public relations, advertising, sales promotions, and other tools to persuade customers to purchase the product offering	sD4.5: Fill Shopping Cart
Promotion Event Calendar	Time phased promotion / event tasks where the product offering is communicated to the customer and includes public relations, advertising, sales promotions, and other tools to persuade customers to purchase the product offering during the year.	sD4.6: Checkout
Purchase History	The amount of purchased products for a certain time in history per specific intervals	sD2.2: Receive, Configure, Enter and Validate Order sD3.1: Obtain and Respond to RFP/RFQ sD1.2: Receive, Enter and Validate Order sED.3: Manage Deliver Information
Quality & Delivery Performance	The process of measuring actual supplier performance against internal and/or external standards, providing feedback to achieve and maintain the performance required to meet the customers' business and/or competitive needs. Or, the extent to which the supplier delivers according to quality specification (e.g. product quality, logistic quality) and to delivery specification (in time, correct packaging etc). Sometimes these two metrics are connected in one.	sES.3: Maintain Source Data

Input/Output	Definition	Process
Quality and Delivery Performance	The process of measuring actual supplier performance against internal and/or external standards, providing feedback to achieve and maintain the performance required to meet the customers' business and/or competitive needs.Or, the extent to which the supplier delivers according to quality specification (e.g. product quality, logistic quality) and to delivery specification (in time, correct packaging etc). Sometimes these two metrics are connected in one.	sES.2: Assess Supplier Performance
Rated Carrier Data	Contract rates and tariffs from carriers by commodity, lane, mode, etc. for shipments.	sD2.6: Route Shipments sD3.6: Route Shipments sD1.6: Route Shipments
Receipt Data	A collection of related receipt data records organized in a specific manner.	sER.4: Manage Return Inventory sDR1.3: Receive Defective Product sDR2.3: Receive MRO Product sDR3.3: Receive Excess Product sER.3: Manage Return Data Collection sER.2: Manage Performance of Return Processes
Receipt Discrepancy Notification	Notification of a discrepancy relating to a receipt, including: damage, packaging, quantity, etc.	sDR1.3: Receive Defective Product sDR3.3: Receive Excess Product sDR2.3: Receive MRO Product
Receipt Verification	Acknowledgement that the product received conforms to specified requirements and criteria.	sED.8: Manage Import/Export Requirements sES.2: Assess Supplier Performance sS1.3: Verify Product sS2.3: Verify Product sS3.6: Transfer Product sS2.2: Receive Product sES.1: Manage Sourcing Business Rules sS1.4: Transfer Product sES.6: Manage Incoming Product sS1.2: Receive Product sS1.3: Verify Product sS3.5: Verify Product sS2.3: Verify Product sS3.5: Verify Product sES.8: Manage Import/Export Requirements sS3.4: Receive Product sS2.4: Transfer Product
Regulatory Requirements	Requirements dictated by process standards set by external entities (i.e. government, trade officials, etc.).	sEP.8: Manage Plan Regulatory Requirements and Compliance sP5.2: Identify, Assess, and Aggregate Return Resources

Inputs/Outputs

Input/Output	Definition	Process
Replenishment Quantities	In a fixed-reorder quantity system of inventory control, the fixed quantity that should be ordered each time the available stock (on-hand plus on-order) falls to or below the reorder point.	sD4.3: Pick Product from Backroom
Replenishment Signal	Any signal that indicates when to produce or transport Items in a pull replenishment system.	sM3.3: Issue Sourced/In-Process Product sM1.2: Issue Material sD2.3: Reserve Inventory and Determine Delivery Date sD1.3: Reserve Inventory and Determine Delivery Date sS3.3: Schedule Product Deliveries sS3.6: Transfer Product sS2.4: Transfer Product sM2.2: Issue Sourced/In-Process Product sS1.1: Schedule Product Deliveries sD3.3: Enter Order, Commit Resources Launch Program sS1.4: Transfer Product sS2.1: Schedule Product Deliveries
Reports, Information, and Documents	Collecting data and organizing, arranging or presenting the data so that they yield an understanding not available from any single data element.	sEM.3: Manage Make Information
Resource Availability	The capability of a system or resource to produce a quantity of output in a particular time period, or the available resources at a point in time able to generate an output.	sD3.3: Enter Order, Commit Resources Launch Program sD4.1: Generate Stocking Schedule sP4.2: Identify, Assess and Aggregate Delivery Resources
Return Benchmark Data	Data relative to the return process utilized to compare the company's actual results to selected values identified as reference.	sER.2: Manage Performance of Return Processes
Return Defective Product		sSR1.1: Identify Defective Product Condition
Returned Defective Product	Product being returned that is in a defective condition.	sSR1.4: Schedule Defective Product Shipment sSR1.4: Schedule Defective Product Shipment sSR1.3: Request Defective Product Return Authorization sDR1.4: Transfer Defective Product sSR1.2: Disposition Defective Product sSR1.5: Return Defective Product sSR1.5: Return Defective Product sSR1.2: Disposition Defective Product sSR1.3: Request Defective Product Return Authorization sR1.3: Receive Defective Product

Inputs/Outputs

Input/Output	Definition	Process
Returned Excess Product	Product being returned as defined by the terms and conditions of a customer/supplier contract as available inventory and disposition excess not usable for sale.	sSR3.1: Identify Excess Product Condition sDR3.3: Receive Excess Product sDR3.4: Transfer Excess Product sSR3.5: Return Excess Product sSR3.2: Disposition Excess Product sDR3.3: Receive Excess Product sSR3.3: Request Excess Product Return Authorization sSR3.4: Schedule Excess Product Shipment sSR3.2: Disposition Excess Product sSR3.4: Schedule Excess Product Shipment
Returned MRO Product	Product being returned for maintenance, repair, or overhaul.	sSR2.3: Request MRO Return Authorization sDR2.3: Receive MRO Product sSR2.2: Disposition MRO Product sSR2.5: Return MRO Product sSR2.3: Request MRO Return Authorization sDR2.4: Transfer MRO Product sSR2.2: Disposition MRO Product sSR2.1: Identify MRO Product Condition sSR2.4: Schedule MRO Shipment sSR2.5: Return MRO Product
Returned Product Information	Data concerning the return and disposition of defective products, excess inventory and/or serviceable or obsolete products, or MRO product.	sEM.4: Manage In-Process Products (WIP)
Return Inventory Availability	Inventory relative to return process available for use.	sSR1.3: Request Defective Product Return Authorization sSR2.5: Return MRO Product sER.4: Manage Return Inventory sSR3.2: Disposition Excess Product sSR1.5: Return Defective Product sSR2.3: Request MRO Return Authorization sSR3.5: Return Excess Product sSR2.2: Disposition MRO Product sSR1.4: Schedule Defective Product Shipment sER.4: Manage Return Inventory sSR3.4: Schedule Excess Product Shipment sSR2.4: Schedule MRO Shipment sSR3.3: Request Excess Product Return Authorization sSR1.2: Disposition Defective Product

Inputs/Outputs

Input/Output	Definition	Process
Return Inventory for Transfer	Inventory relative to return process available for transfer to other destination.	sDR2.4: Transfer MRO Product sDR1.4: Transfer Defective Product sER.4: Manage Return Inventory sDR3.4: Transfer Excess Product
Return Inventory Targets	The goals and approach to the management of return inventories.	sP5.2: Identify, Assess, and Aggregate Return Resources sER.4: Manage Return Inventory
Return Inventory Transfer Data	The process of receipt and verification of the returned item against the return authorization and other documentation and prepares the item for transfer.	sS3.3: Schedule Product Deliveries sP5.2: Identify, Assess, and Aggregate Return Resources sDR3.3: Receive Excess Product sDR3.4: Transfer Excess Product sER.4: Manage Return Inventory sDR2.4: Transfer MRO Product sDR1.4: Transfer Defective Product sS2.1: Schedule Product Deliveries sS1.1: Schedule Product Deliveries
Return Network Configuration	The business rules that govern the flow of unserviceable material through the network, i.e. the network configuration.	sER.7: Manage Return Network Configuration sER.8: Manage Return Regulatory Requirements and Compliance
Return Performance	Performance measurement information for the Return Process (the actual value of measured for the criterion).	sER.2: Manage Performance of Return Processes sER.5: Manage Return Capital Assets sER.6: Manage Return Transportation
Return Plans	Courses of action over specified time periods that represent the projected appropriation of required return resources and or assets to meet the return process requirements.	sDR3.1: Authorize Excess Product Return sER.4: Manage Return Inventory sSR2.2: Disposition MRO Product sDR2.1: Authorize MRO Product Return sER.5: Manage Return Capital Assets sSR1.2: Disposition Defective Product sER.6: Manage Return Transportation sER.7: Manage Return Network Configuration sSR3.2: Disposition Excess Product sDR1.1: Authorize Defective Product Return sP5.4: Establish and Communicate Return Plans
Return Process Capabilities	The capability of a system or resources to produce a quantity output in a particular time period	sP5.2: Identify, Assess, and Aggregate Return Resources sEP.2: Manage Performance of Supply Chain
Return Process Workflow Definition and Policies	Definition and maintenance of the information flow about the Returns supply chain network for a group of similar or complimentary items through out their life cycle	sER.7: Manage Return Network Configuration sP5.2: Identify, Assess, and Aggregate Return Resources

Input/Output	Definition	Process
Return Product Authorization	Permission to accept an excess product return for the designated return center, after communicating with the customer.	sDR3.1: Authorize Excess Product Return sDR3.2: Schedule Excess Return Receipt
Return Product History	The return history of product including failure rates, failure causes, etc.	sER.3: Manage Return Data Collection sER.2: Manage Performance of Return Processes
Return Production Requirements	As a whole with constituent parts, all sources of demand in the creation of a product or service.	sP3.1: Identify, Prioritize and Aggregate Production Requirements sP5.4: Establish and Communicate Return Plans sP3.1: Identify, Prioritize and Aggregate Production Requirements
Return Product Location	The physical location where the returned product inventory is held prior to disposition	sSR1.2: Disposition Defective Product sER.4: Manage Return Inventory sSR3.2: Disposition Excess Product sER.4: Manage Return Inventory sSR2.2: Disposition MRO Product
Return Regulatory Requirements	Return requirements dictated by process standards set by external entities (i.e. government, trade officials, etc.).	sDR2.3: Receive MRO Product sP5.2: Identify, Assess, and Aggregate Return Resources sDR3.3: Receive Excess Product sP5.1: Assess and Aggregate Return Requirements sER.8: Manage Return Regulatory Requirements and Compliance sP1.2: Identify, Prioritize and Aggregate SC Resources sDR1.3: Receive Defective Product
Return Requirements	As a whole with constituent parts, all sources of demand for the return of a product.	sP5.1: Assess and Aggregate Return Requirements sP5.3: Balance Return Resources with Return Requirements
Return Resources	All resources that add value to, execute, or constrain the processes for the return of a product.	sP5.3: Balance Return Resources with Return Requirements sP5.2: Identify, Assess, and Aggregate Return Resources
Return Rules and Policies	Rules and Policies for conducting business, i.e. developing and maintaining customer and channel performance standards of return processes such as service levels, given service requirements by supply chain stakeholders/trading partners. Rules and policies align the Return process with the organization's business strategy, goals and objectives.	sER.1: Manage Business Rules for Return Processes sP5.4: Establish and Communicate Return Plans

Inputs/Outputs

Input/Output	Definition	Process
Return Schedule Instructions	A list of operations and procedures for scheduling the return of product.	sDR2.3: Receive MRO Product sDR1.2: Schedule Defective Return Receipt sDR3.3: Receive Excess Product sDR3.2: Schedule Excess Return Receipt sSR2.3: Request MRO Return Authorization sDR2.2: Schedule MRO Return Receipt sDR1.3: Receive Defective Product sSR1.3: Request Defective Product Return Authorization sSR3.3: Request Excess Product Return Authorization
Returns Data	The properties, characteristics and information relating to returns, including failure information, excess, obsolete, MRO, customer, etc.	sED.8: Manage Import/Export Requirements sED.4: Manage Finished Goods Inventories
Return Transportation Guidelines, Policies, & Agreements	Guidelines, policies and agreements for the transportation activities around return process.	sDR1.3: Receive Defective Product sDR3.3: Receive Excess Product sER.6: Manage Return Transportation sDR2.3: Receive MRO Product
Return Transportation Guidelines, Policies, and Agreements	Guidelines, policies and agreements for the transportation activities around return process.	sP5.2: Identify, Assess, and Aggregate Return Resources
Revised Aggregate Forecast and Projections	An update to the aggregate Supply-Chain Forecasts of Demand by Product Family supporting the Market/Channel Plans. Corresponding Projections, supporting Make, Source, Deliver, Inventory and Response Time Plans through the Supply-Chain are produced from these Forecasts Together, they represent balanced Supply and Demand.	sEP.10: Align Supply Chain Unit Plan with Financial Plan sP1.1: Identify, Prioritize and Aggregate SC Requirements sP5.1: Assess and Aggregate Return Requirements
Revised Business Assumptions	An update to the expected cause and effect statements that are the base for the Revised Aggregate Forecast and Projections. These are reviewed periodically with actual results to verify the linkage of actual cause and effect.	sP5.1: Assess and Aggregate Return Requirements sP1.1: Identify, Prioritize and Aggregate SC Requirements sEP.5: Manage Integrated Supply Chain Capital Assets sED.7: Manage Product Life Cycle sEP.10: Align Supply Chain Unit Plan with Financial Plan

Input/Output	Definition	Process
Revised Capital Plan	A revision to plan for capital expenditures necessitated by either changes in specific business plans or factors and assumptions affecting a business plan.	sEP.6: Manage Integrated Supply Chain Transportation sEP.5: Manage Integrated Supply Chain Capital Assets sP5.2: Identify, Assess, and Aggregate Return Resources sP1.2: Identify, Prioritize and Aggregate SC Resources
RFQ/RFP	Request for Quote - A document used to solicit vendor responses when a product has been selected and price quotations are needed from several vendors. Request for Proposal - A document used to solicit vendor responses when the functional requirements and features are known but no specific product is in mind.	sD3.1: Obtain and Respond to RFP/RFQ
Risk Management Program for Process Area		sES.9: Manage Supply Chain Source Risk sED.9: Manage Supply Chain Deliver Risk sEM.9: Manage Supply Chain Make Risk sEP.9: Manage Supply Chain Plan Risk sER.9: Manage Supply Chain Return Risk
Routing Guide	Information used to select modes, transportation lanes, available carriers, etc. Listing or routes, carriers & rates.	sD3.6: Route Shipments sD2.6: Route Shipments sD1.6: Route Shipments
Satisfied Customer	Customers who are satisfied with the product or service delivered by the suppliers, including the aspects such as time, quality, cost, etc.	sD4.6: Checkout
Scheduled Defective Product Return	Planned or scheduled returning of material deemed defective for some certain time or times	sSR1.5: Return Defective Product sSR1.4: Schedule Defective Product Shipment
Scheduled Deliveries	The required or agreed time or rate of delivery of goods or services purchased for a future period.	sD3.5: Build Loads sD1.7: Select Carriers and Rate Shipments sD2.6: Route Shipments sD1.9: Pick Product
Scheduled Excess Product Return	Planned or scheduled returning of material deemed in excess of current requirements for some certain time or times.	sSR3.4: Schedule Excess Product Shipment sSR3.5: Return Excess Product
Scheduled Installation	The process of evaluating the design and build schedules relative to customer requested installation date to determine installation schedule.	sD3.5: Build Loads sD3.4: Schedule Installation
Scheduled MRO Return	Planned or scheduled act of installing something for some certain time or times.	sSR2.5: Return MRO Product sSR2.4: Schedule MRO Shipment

Inputs/Outputs

Input/Output	Definition	Process
Scheduled Receipts	Product due to arrive.	sS3.3: Schedule Product Deliveries sD1.8: Receive Product from Source or Make sM2.1: Schedule Production Activities sM3.2: Schedule Production Activities sM1.1: Schedule Production Activities sD4.2: Receive Product at the Store sS3.4: Receive Product sS1.1: Schedule Product Deliveries sS1.2: Receive Product sS2.1: Schedule Product Deliveries
Scrap Authorization	Permission to scrap material or item outside of specifications and possessing characteristics that make rework impractical.	sED.8: Manage Import/Export Requirements sED.4: Manage Finished Goods Inventories
Service Levels	Performance targets in service related measures (i.e. delivery performance, lead times, etc.) compared to the established service requirements. Service levels are established by balancing requirements against operational strategy.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sEP.1: Manage Business Rules for Plan Processes
Service Requirements	A set of minimum acceptable values that describe service requirements of a particular industry, channel, and/or customer segment.	sEP.1: Manage Business Rules for Plan Processes
Shipment Documents	Legal documentation of the contents of a shipment (e.g. way bill, bill of lading, export papers, etc....).	sSR1.5: Return Defective Product sSR3.5: Return Excess Product
Shipment Routes	Routes for shipping by consolidating loads.	sD2.7: Select Carriers and Rate Shipments sD1.7: Select Carriers and Rate Shipments sD1.6: Route Shipments sD2.6: Route Shipments
Shipments	Transactions related to sending the product to the customer.	sD1.3: Reserve Inventory and Determine Delivery Date sP1.1: Identify, Prioritize and Aggregate SC Requirements sD1.11: Load Vehicle & Generate Shipping Docs
Shipping Documents	Legal documentation of the contents of a shipment (e.g. way bill, bill of lading, export papers, etc....).	sD2.11: Load Product & Generate Shipping Documentation sSR2.5: Return MRO Product sD3.11: Load Product & Generate Shipping Documents sD1.11: Load Vehicle & Generate Shipping Docs

Input/Output	Definition	Process
Shipping Export Parameters and Documentation	Shipping and documentation requirements established by a government which must be met before allowing the shipping or delivery of a product across national boundaries.	sD3.11: Load Product & Generate Shipping Documents sD1.11: Load Vehicle & Generate Shipping Docs sED.8: Manage Import/Export Requirements sD2.11: Load Product & Generate Shipping Documentation
Shipping History	The transaction history of the physical shipment of an item to another internal location or to a customer.	sD2.11: Load Product & Generate Shipping Documentation sD1.11: Load Vehicle & Generate Shipping Docs sD3.11: Load Product & Generate Shipping Documents sED.8: Manage Import/Export Requirements
Shipping Parameters and Documentation	Shipping parameters, such as weight, size, cube and route decide carrier and cost. Legal documentation of the contents of a shipment (e.g. way bill, bill of lading, export papers, etc.) are required.	sD2.11: Load Product & Generate Shipping Documentation sD1.11: Load Vehicle & Generate Shipping Docs sED.6: Manage Transportation sD3.11: Load Product & Generate Shipping Documents
Shipping Preferences (Customer)	Customer preferences including shipping, status, and delivery requirements, etc., and customer profile, which includes address data, credit and purchase histories,	sD2.2: Receive, Configure, Enter and Validate Order sD1.2: Receive, Enter and Validate Order sD3.1: Obtain and Respond to RFP/RFQ sED.3: Manage Deliver Information
Shipping Schedules (internal or 3PL)	Scheduling of direct deliveries of material to a specified location on a plant floor near the operation where it is to be used.	sD4.1: Generate Stocking Schedule
Ship-to Data	Data about the destination of a return delivery.	sSR1.3: Request Defective Product Return Authorization sDR3.1: Authorize Excess Product Return sSR1.4: Schedule Defective Product Shipment sSR3.4: Schedule Excess Product Shipment sSR2.3: Request MRO Return Authorization sSR2.4: Schedule MRO Shipment sDR1.1: Authorize Defective Product Return sDR2.1: Authorize MRO Product Return sSR3.3: Request Excess Product Return Authorization

Inputs/Outputs

Input/Output	Definition	Process
Source Execution Data	Data which will provide measurement of actual supplier performance against internal and or external standards to provide feedback to achieve and maintain the performance required to meet the customer's needs.	sS2.1: Schedule Product Deliveries sM2.2: Issue Sourced/In-Process Product
Source Return Requirements	All sources of demand in the Source Return of a product or service.	sP5.4: Establish and Communicate Return Plans sP2.1: Identify, Prioritize and Aggregate Product Requirements
Sourcing Plans	An aggregate material requirements plan used to schedule material deliveries to meet production plan.	sS3.1: Identify Sources of Supply sD2.3: Reserve Inventory and Determine Delivery Date sDR2.4: Transfer MRO Product sES.3: Maintain Source Data sES.4: Manage Product Inventory sD1.3: Reserve Inventory and Determine Delivery Date sS1.1: Schedule Product Deliveries sP3.2: Identify, Assess and Aggregate Production Resources sS2.1: Schedule Product Deliveries sDR1.4: Transfer Defective Product sP2.4: Establish Sourcing Plans sDR3.4: Transfer Excess Product P4.2: Identify, Assess and Aggregate Delivery Resources sP5.1: Assess and Aggregate Return Requirements sS3.3: Schedule Product Deliveries sD3.3: Enter Order, Commit Resources Launch Program sP5.2: Identify, Assess, and Aggregate Return Resources sP1.2: Identify, Prioritize and Aggregate SC Resources Function allocation diagram
Standard Practices/Rules	Industry established common practices, rules, and methods of doing business.	sED.6: Manage Transportation
Stocking Requirements	The activities and techniques of determining the desired levels of items, whether raw materials, work in process, or finished products. Demand for inventory may be dependant or independent. Inventory functions are anticipation, hedge, cycle (lot size), fluctuation (safety, buffer or reserve), transportation (pipeline), and service parts.	sD4.1: Generate Stocking Schedule sP4.4: Establish Delivery Plans

Input/Output	Definition	Process
Stocking Schedule	A timetable for the planned movement of material from a bulk storage area to an order pick storage area.	sD4.4: Stock Shelf sD4.1: Generate Stocking Schedule
Stock-out History	History of a lack of materials, components, or finished goods that are ordered.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Store Allocation Instructions	A list of operations and procedures for allocating storage needs for items in inventory.	sD4.1: Generate Stocking Schedule
Store Shelf Inventory Counts	The determination of inventory quantity by actual count. Physical inventories can be taken on a continuous, periodic or annual basis.	sD4.4: Stock Shelf sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Strategic Plan	A longer range, high-level plan that describes how a company intends to conduct business. Improve its market and competitive position, and increase its earnings performance.	sEP.1: Manage Business Rules for Plan Processes sEP.10: Align Supply Chain Unit Plan with Financial Plan
Successful Installation / Live System	The installation of product is completed at the customer site, and the product is fully functional.	sD4.7: Deliver and/or Install
Supplier Agreement	An agreement between supplier and purchaser to perform or not to perform specific acts or services or to deliver merchandise, such as purchase order or supplier contract.	sES.5: Manage Capital Assets sEM.6: Manage Transportation (WIP) sES.10: Manage Supplier Agreements sS3.3: Schedule Product Deliveries sS3.2: Select Final Supplier (S) and Negotiate sES.7: Manage Supplier Network sES.10: Manage Supplier Agreements
Supplier Data	Data or information about the supplier. This data can be organizational, product, information, financial. Structured supplier data is needed to set up and implement ERP or similar systems.	sES.2: Assess Supplier Performance sES.10: Manage Supplier Agreements sS3.2: Select Final Supplier (S) and Negotiate sES.1: Manage Sourcing Business Rules sES.7: Manage Supplier Network sS3.1: Identify Sources of Supply sES.3: Maintain Source Data
Supplier Performance	The results of measuring the actual supplier performance on cost, quality, engineering, purchasing, and so on, based on an agreed set of measurements.	sS1.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries sES.2: Assess Supplier Performance sS2.1: Schedule Product Deliveries sES.7: Manage Supplier Network
Supply Chain Execution Data	Information necessary to plan the balance of supply chain resources to demand requirements at both the highest aggregate and lowest SKU planning levels.	sEP.3: Manage Plan Data Collection

Inputs/Outputs

Input/Output	Definition	Process
Supply Chain Performance Improvement Plan	A plan that describes goals and objectives for a supply chain and the steps that will be taken to reach those goals and objectives from the current performance levels.	sP5.3: Balance Return Resources with Return Requirements sP1.3: Balance Supply Chain Resources with SC Requirements sEP.2: Manage Performance of Supply Chain
Supply-Chain Performance Metrics	Standard measures that indicate how well a supply chain performs within certain categories of performance known as Performance Attributes, e.g. delivery reliability, flexibility and responsiveness, cost, and asset management.	sED.2: Assess Delivery Performance sES.4: Manage Product Inventory sED.1: Manage Deliver Business Rules sEP.2: Manage Performance of Supply Chain sED.5: Manage Deliver Capital Assets sEM.2: Manage Production Performance sER.2: Manage Performance of Return Processes
Supply Chain Plans	Courses of action over specified time periods that represent a projected appropriation of total supply-chain resources to meet total supply-chain demand requirements.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sEM.7: Manage Production Network sP2.1: Identify, Prioritize and Aggregate Product Requirements sP5.1: Assess and Aggregate Return Requirements sP1.4: Establish & Communicate Supply-Chain Plans sP3.1: Identify, Prioritize and Aggregate Production Requirements
Supply Chain Requirements	Sources of demand for the integrated supply chain of a product or service at the appropriate level, horizon and interval.	sP1.3: Balance Supply Chain Resources with SC Requirements sP1.1: Identify, Prioritize and Aggregate SC Requirements
Supply Chain Resources	As a whole with constituent parts, all sources of supply that are required to add value in the supply chain of a product or service at the appropriate level, horizon and interval.	sP1.2: Identify, Prioritize and Aggregate SC Resources sP1.3: Balance Supply Chain Resources with SC Requirements
Systems Capability	The capability of a system to perform its expected function	sEM.3: Manage Make Information
Tariffs & Duties	Charges established by a government which must be met before allowing the shipping or delivery of a product across national boundaries.	sED.8: Manage Import/Export Requirements
Transferred Product	Product being transferred to the appropriate stocking location within the supply chain.	sS3.6: Transfer Product sS3.7: Authorize Supplier Payment sS2.5: Authorize Supplier Payment sS1.4: Transfer Product sS1.5: Authorize Supplier Payment sS2.4: Transfer Product

Input/Output	Definition	Process
Transportation Capacity	The capability of a transportation system to perform its function.	sEM.2: Manage Production Performance sEP.6: Manage Integrated Supply Chain Transportation sEM.1: Manage Production Rules
Validated Order	An order that has had the instructions / requirements validated i.e. the information that the order contains is accurate, consistent with previous information and does not violate business policies or rules. Note 1 - this does not make the order "committed" there may be other tasks to be performed before a commitment can be made. Note 2 - this order could be customer, internal, purchase or production.	sD1.2: Receive, Enter and Validate Order sD1.2: Receive, Enter and Validate Order sD1.3: Reserve Inventory and Determine Delivery Date
Validated Return Material Authorization	A validated and approved Return Product Authorization (RPA).	sSR1.3: Request Defective Product Return Authorization sSR3.3: Request Excess Product Return Authorization sSR3.4: Schedule Excess Product Shipment sSR1.4: Schedule Defective Product Shipment
Valid Returns Request	Requests for returns that are valid.	sDR1.1: Authorize Defective Product Return sDR2.1: Authorize MRO Product Return sDR2.2: Schedule MRO Return Receipt sDR1.2: Schedule Defective Return Receipt
Vendor/DC inventory availability	Vendor/DC inventory available to a customer to supply demands. (Where the customer has access to the supplier's inventory and the supplier has access to the customer's requirements and inventory or vendor managed inventory).	sD4.1: Generate Stocking Schedule
Vendor Merchandising / Co-op advertising agreements	The plan for a promotional product offering and how it is communicated to the customer and includes public relations, advertising, sales promotions, and other tools to persuade customers to purchase the product offering.	sD4.4: Stock Shelf
Warehouse Operating Constraints	Warehouse constraints are those storage items that impact on the supply chain efficiency, including material handling equipment and personnel, equipment maintenance, building maintenance, and security personnel.	sED.5: Manage Deliver Capital Assets

Inputs/Outputs

Input/Output	Definition	Process
Warranty Data	All data relevant to a warranty claim for a customer for replacement, repair or credit because the product received did not meet a commitment, either expressed or implied, concerning a certain fact regarding the product	sSR2.1: Identify MRO Product Condition sSR1.1: Identify Defective Product Condition sER.8: Manage Return Regulatory Requirements and Compliance
WIP Handling Rules, Move Information and Methods	The rules for handling WIP items in the production and repair process. These rules include the movement and accounting for in-process items between work locations, in inventory, and movement inventory.	sEM.6: Manage Transportation (WIP) sEM.4: Manage In-Process Products (WIP) sM3.3: Issue Sourced/In-Process Product sM1.2: Issue Material sM2.2: Issue Sourced/In-Process Product
WIP Inventory Location	Location of inventory that is specified as "work in progress". This can be intermediate storage in a manufacturing facility prior to final packaging or can be a class of materials waiting final transformation to finished products.	sS1.4: Transfer Product sS2.4: Transfer Product sS3.6: Transfer Product sEM.6: Manage Transportation (WIP)
WIP Location Rules	The process and rules for establishing and maintaining in-process item inventory ownership and stocking locations.	sM2.2: Issue Sourced/In-Process Product sD2.9: Pick Product sM3.3: Issue Sourced/In-Process Product sM1.2: Issue Material sEM.6: Manage Transportation (WIP)
WIP Move Information and Methods	The process of recording and tracking the movement of WIP items through the production and repair process. This process includes item stocking and accounting requirements.	sEM.6: Manage Transportation (WIP)
Year-to-Year for Like SKU/ Subclass	The sales or demand history that is analogous to the present situation for similar products, a SKU / Subclass.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements

Section 4

Best Practices

Introduction to Best Practices

A best 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 types of practices exist within any organization:

- **Leading or Emerging practices**
- **Best practices**
- **Common practices**
- **Poor practices.**

These practice categories go by other names as well. What's important to understand is that different practices have different performance expectations. The classification of a practice will vary by industry. For some industries a practice may be common, whereas the same practice may be considered a leading 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.

Leading practices

Leading practices introduce new technology, knowledge or radically different ways of organizing processes. Leading practices may yield a step change in performance by 'redefining the playing field' within an industry. Leading practices may not be easy to adopt because of proprietary technology, or special knowledge may prevent wider adoption. Leading practices generally have not been proven in a wide variety of environments and industries.

Risk: High, Results: High.

Best practices

Best practices are 'current', 'structured' and 'repeatable' practices that have had a proven and positive impact on supply chain performance.

- **Current:** Not emerging, not outmoded.
- **Structured:** Feature a clearly stated goal, scope, process, and procedure.
- **Proven:** Demonstrated in a working environment, and linked to key metrics.
- **Repeatable:** Proven in multiple organizations and industries.

SCOR best practices have been chosen by SCOR practitioners in diverse industries. It is understood that not all best practices will yield the same results for all industries or supply chains. *Risk: Moderate, Results: Moderate.*

Best Practices

Common practices

Common practices are how a wide range of companies have historically done business by default or happenstance. These well established practices do the job, but don't provide a significant cost or competitive advantage over other practices (except over bad practices).

Risk: Low, Results: Low.

Poor practices

Poor practices represent ways of doing business, which can be widespread, that have proven to result in poor supply chain performance as indicated by key metrics.

Risk: High, Results: Negative.

Available-to-Promise (ATP)

Available-to-Promise (ATP) provides an availability and feasibility check concerning a customer request or a customer order whereas three outputs can be distinguished:

1. the soonest delivery date concerning the customer request,
2. the confirmation of desired delivery date, item quantity, and item configuration
3. the selection of alternative, but deliverable product variants in case the desired delivery parameters can not be fulfilled.

ATP is applicable over multiple sites in a global environment. Essentially, it is based on the extrapolation of the available inventory in all relevant locations over time:

ATP is the uncommitted portion of a company's inventory and planned production maintained in the master schedule to support customer-order promising. The ATP quantity is the uncommitted inventory balance in the first period and is normally calculated for each period, in which an MPS (Master Production Schedule) receipt is scheduled.

SCOR Process(es)

sD1.3 (Reserve Resources and Determine Delivery Date)

Best Practice Need and Suitability Indicators

ATP is particularly suitable for environments where customers require on-time and fast deliveries.

Additional Comments

Three methods of ATP calculations are used: discrete ATP, cumulative ATP with look-ahead, and cumulative ATP without look-ahead.

Discrete available-to-promise is calculated based on beginning inventory, planned production according to the master production schedule (MPS) and customer commitments. For the first period, the available-to-promise is the sum of the beginning inventory plus the planned production for the first period minus customer commitments for the first period and all periods following the first period up to, but not including, the next period for which production has been scheduled in the MPS. For the following periods, there are two possibilities:

- If a master production quantity has been scheduled for the period the available-to-promise is the quantity scheduled minus all customer commitments for the period and for all following periods up to but not including, the next period for which a master production quantity has been scheduled.
- If no master production quantity has been scheduled for the period the available-to-promise is zero, even if deliveries in the period have been promised. The promised shipments often are shown as backlog (customer commitments) in the period with the most recent production (MPS).

Cumulative available-to-promise is a calculation based on the available-to-promise (ATP) figure in the master schedule. Two methods of computing the cumulative available-to-promise are used, with and without look-ahead calculation. The cumulative with look-ahead ATP equals the ATP from the previous period plus the MPS of the period minus the sum of the differences between the backlogs and MPSs of all future periods until, but not to include, the period where point production exceeds the backlogs. The cumulative without look-ahead procedure equals the ATP in the previous period plus the MPS, minus the backlog in the period being considered.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	improves on-time delivery resulting in a higher service level (to commit date).
Responsiveness	reduces cycle times of certain administrative processes (e.g. definition of delivery date, order placement)
Flexibility	allows determining whether flexibility is appropriate to cover future demand fluctuations and to prioritize activities accordingly.
Costs	None (except for less contract penalties caused by late deliveries)
Asset Management	Visibility of demand vs. production schedule and available inventory can result in better inventory planning and lower inventory levels.

Key Best Practice Success Factors

Technology Features	Available-to-promise requires implementation in an ERP-/SCM-/APS-software solution.
Other Success Factors	Appropriate data management guarantees exact ATP quantities.

Additional Resources

Cox, J. F.; Blackstone J. H. (2004): American Production and Inventory Control Society (APICS) Dictionary, 11th edition, APICS – The Educational Society for Resource Management, Alexandria, VA

Schönsleben, P. (2003): Integral Logistics Management – Planning & Control of Comprehensive Supply Chains, St. Lucie Press, Boca Raton, FL, p. 233-235

Carrier Agreements

Carrier agreements are agreements between a company and its domestic and global carriers (for both, inbound raw materials and outbound finished goods) specifying service levels, payment terms, and other conditions. Such agreements can be established as part of a larger initiative to decrease raw material and finished goods inventory, while improving customer service.

Contractual partnership requirements can include:

- Perfect Order Fulfilment (as a primary goal),
- equipment condition
- shipping condition
- pick-up and delivery times,
- documentation.

Carrier performance in these fields is measured with immediate feedback and monthly formal reports. By measuring all carriers on a regular basis, trends of performance can be seen. This provides the opportunity to replace carriers performing “poorly” with those performing “exceptionally”.

Furthermore, a transportation service agreement is signed with all domestic and global carriers. Contract line items specify on-time delivery, plus the payment requirements for services rendered.

SCOR Process(es)

sS1.2, sS2.2, sS3.2 (Receive Product), sES.2 (Assess Supplier Performance), ES.7 (Manage Supplier Network), sES.9 (Manage Supplier Agreements), sD1.11, sD2.11, sD3.11 (Load Vehicle & Generate Shipping Documentation)

Best Practice Need and Suitability Indicators

Any company receiving or shipping materials using common or contract carriers such as trucking, shipping, and airline companies. Also includes internal transportation providers (company owned transportation group).

Additional Comments

The top performance of carriers is due to a thorough knowledge of the industry and the requirements of a company, as well as the contract that is used with the carriers. Without a competent transportation manager, the contract, alone, would be of little value. The combination of trained, competent personnel and written agreements result in superior performance.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Better partnerships with and management of carriers typically results in improved on time deliveries.
Responsiveness	Carrier agreements often improve the ability to quickly book and execute transportation, reducing lead times.
Flexibility	Partnerships tend to work both ways, leading carriers to make additional capacity available to partners when needed, improving the ability to respond quickly to demand increases.
Costs	Carrier agreements provide a tool for both shipper and carrier to identify and take advantage of mutual cost savings.
Asset Management	More efficient use of transportation assets to move customer orders.

Key Best Practice Success Factors

Technology Features	From the carrier side, their tracking systems support performance measurement to a different degree (EDI, web-enabled carriers). Continuous on line tracking of shipment would be beneficial.
Other Success Factors	<p>Anyone interfacing with the carrier needs to be familiar with the carrier agreement specifications.</p> <p>Formal recognition of carriers, for example, they can be certified on basis of six months reliability/compliance to the agreement. Formal feedback on monthly performance and immediate feedback on failures to comply with specifications.</p>

Additional Resources

None Identified

Collaborative Planning, Forecasting and Replenishment (CPFR)

The CPFR reference model provides a general framework for the collaborative aspects of planning, forecasting and replenishment processes. The model is considered a “guideline” for trading partner collaboration, which should be tailored specially for the industry and company readiness and maturity.

CPFR defines eight collaboration tasks:

- Collaboration Arrangement is the process of setting the business goals for the relationship, defining the scope of collaboration and assigning roles, responsibilities, checkpoints and escalation procedures.
- The Joint Business Plan then identifies the significant events that affect supply and demand in the planning period, such as promotions, inventory policy changes, store openings/closings, and product introductions.
- Sales Forecasting projects consumer demand at the point of sale.
- Order Planning/Forecasting determines future product ordering and delivery requirements based upon the sales forecast, inventory positions, transit lead times, and other factors.
- Order Generation transitions forecasts to firm demand.
- Order Fulfillment is the process of producing, shipping, delivering, and stocking products for consumer purchase.
- Exception Management is the active monitoring of planning and operations for out-of-bounds conditions.
- Performance Assessment calculates key metrics to evaluate the achievement of business goals, uncover trends or develop alternative strategies.

Based on this general framework, CPFR discusses collaboration scenarios (like replenishment collaboration or collaborative assortment planning), collaboration roles (who of the two partners involved is responsible for collaboration tasks), and organizational implications within partner companies.

The CPFR industry standard is sponsored by VICS, the Voluntary Inter-industry Standards body and the Uniform Code Council, UCC. The standard has also been adopted by the Global Commerce Initiative, GCI.

SCOR Process(es)

sP1 (Plan Supply Chain)

Best Practice Need and Suitability Indicators

Companies that heavily rely on demand forecast accuracy and high volume replenishment are primary beneficiaries of the standard.

Additional Comments

CPFR has primarily been adopted by the retail and consumer package goods industry. Wal-Mart was the founding company of the process and recently announced adoption by 1,200 of its suppliers. The process has also been adopted by the grocery industry as well as the chain drug store industry.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact	
Reliability	Better Store in stock	2% - 8%
	Better customer service	2% - 8%
Responsiveness	Faster Replenishment Cycle Times 12% - 30%	
Flexibility	Forecast improvement	20% - 40%
Costs	Lower Logistics Cost	3% - 4%
Asset Management	Inventory Reduction	10% - 40% (AMR)

Key Best Practice Success Factors

Technology Features	VICS CPFR interoperability technology standards documented and published by the CPFR Working Group. Standards support EDI 830, EDI 852, and XML Interoperability. Standards published for data modeling.	
Other Success Factors	Careful selection of trading partners. Having a joint front-end agreement to refer back to when the project gets off track.	

Additional Resources

www.cpfr.org

is the official website for the VICS CPFR Working group. This site contains multiple publications on CPFR as well as the actual CPFR process mapping guidelines, data model formats, and CPFR presentations.

Suleski, Janet (2001): Beyond CPFR: Retail Collaboration Comes of Age, AMR Research, April 1, 2001.

www.globalscorecard.net

The Global Scorecard. This site provides a Capability Assessment Tool designed to give you a detailed understanding of your ECR (Efficient Consumer Response) capability and highlight specific improvement opportunities for your company. ECR was an early foundation for CPFR.

www.drummondgroup.com

The Drummond Group on CPFR interoperability has certified technology companies. Test results are available on their web site.

Co-Located Procurement Representatives

Regionalized Procurement Representatives are positioned in local markets to support corporate / procurement goals. Companies realize support is needed when cost and delivery objectives are not consistent with organizational goals. This leading practice involves identifying local procurement personnel to assist in creating a supply base to meet internal and external product requirements. These local representatives will perform all procurement related activities for the organization. Co-located procurement personnel bring the knowledge of the local supply base, understand their organizations demand and supply signals, and communication capability to work with company global commodity leadership.

For companies expanding their sourcing scope and distance, having personnel local to the market is a crucial element to maintaining supply chain performance. Local personnel are used to support the understanding of the demand and supply signals, production and logistics decisions. Companies that have sourced globally, but have not added local resources find challenges that diminish supply chain response time. Listed are some of the major factors: 1.) Communication (time, language, cultural) 2.) Lead time, 3.) Hidden Costs (taxes, tariffs, etc.), 4.) Quality Returns and Repairs, 5.) Political and Geography Risks, 6.) Units of Measure.

Cost is the huge driver in this Best Practice. For example, decisions affecting the supply chain can be made more accurately and in a timelier manner by experts in the field who can experience the day-to-day activities.

SCOR Process(es)

sP1 (Plan Supply Chain)

Best Practice Need and Suitability Indicators

The best practice is most of all suitable for companies that source a large portion of their procurement volume in low-wage countries with a different culture.

Additional Comments

Regular meetings at least once a year among peers should be organized to share priorities and to align processes and reapplication opportunities.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Increase Order Fill Rates
Responsiveness	Reduction in Product Lead-Time Improved Supply Chain Response Time Improved Source/Make Cycle Time
Flexibility	Improved Production Plan Achievement Reduced Inventory Obsolescence
Costs	Impacts Purchase Order Costs Reduced Quality Returns
Asset Management	Increase Capacity Utilization Decrease Inventory Obsolescence

Key Best Practice Success Factors

Technology Features	Accessibility, accuracy, timeliness and visibility of enterprise-wide procurement information. Commercial software (of varying degrees of sophistication) is available to support the procurement and planning processes.
Other Success Factors	None identified

Additional Resources

None Identified

Convergence of SCOR, Six Sigma and Lean Methodology

SCOR, a cross-industry top-down standardized process analysis model, enables the efficient and effective end-to-end evaluation of supply chains. By capturing operational baselines and comparing to industry peers and competitors, SCOR level one metrics provide a balanced measure of performance linked to the bottom line. Metrics and Best Practices steer teams to proven solutions, and the building block design provides a common language for both internal and external elements of a supply chain. SCOR therefore serves as a strategic project identification and prioritization engine for Lean and Six Sigma teams and provides the means to measure business impact.

The strength of Six Sigma and Lean is producing results. These powerful methodologies can be used to gain efficiency and construct valuable processes because these disciplines, by their nature, look down at finite areas, cells, or processes to improve. They cannot look upward at organizational goals and select the best project on which to work.

SCOR also helps introduce the concepts of Six Sigma and Lean to transactional (non manufacturing) areas not normally associated with productivity or quality initiatives. With its cross functional makeup a SCOR project team will focus on reducing variability and eliminate waste in areas such as accounting, customer service, and sales.

SCOR Process(es)

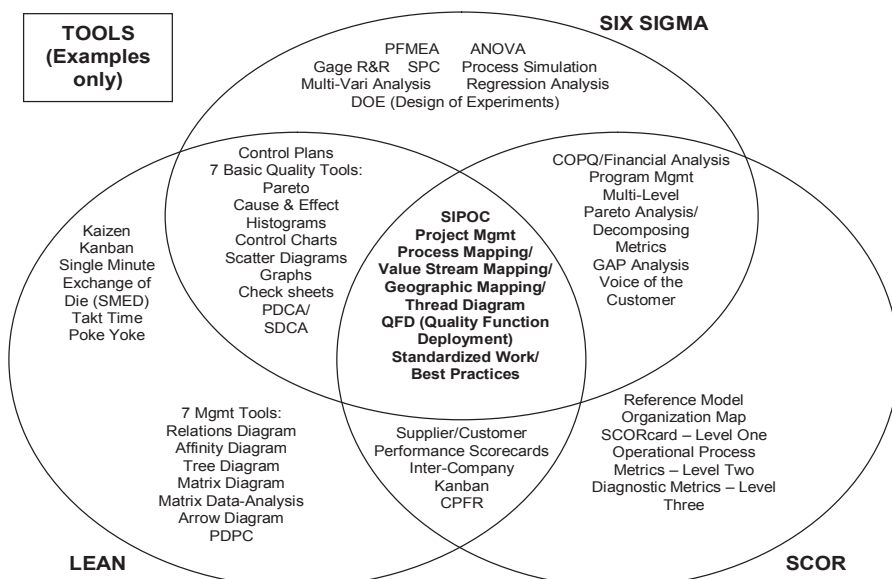
None Identified

Best Practice Need and Suitability Indicators

Need to prioritize lean and six sigma project according to their effects on organizational goals.

Additional Comments

This Venn Diagram highlights tools of each methodology:



Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Convergence of SCOR, Six Sigma and Lean Methodology (with SCOR as a strategic project identification and prioritization engine) enables organizations to improve the <i>right</i> performance attributes, which can be any set of SCOR level one metrics.
Responsiveness	
Flexibility	
Costs	
Asset Management	See other SCOR Best Practices and especially the Best Practices “Six Sigma” and “Lean Methodology” for possible impacts.

Key Best Practice Success Factors

Technology Features	None Identified
Other Success Factors	None Identified

Additional Resources

There is a Supply Chain Council Special Interest Group on this Best Practice. Please contact the group, if you would like to contribute to the convergence of SCOR, Six Sigma and Lean Methodology.

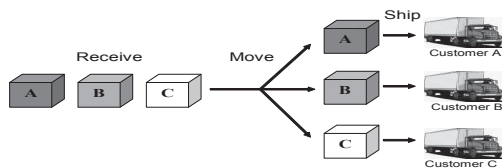
Cross Docking

Cross docking is used in many distribution centers (DC) to increase inventory velocity while maintaining shipping efficiency. In a traditional DC, the receiving process is disjointed from the shipping process and storage acts as an intermediary between the two processes. Cross docking actively links the receiving and shipping processes. In a DC, both cross docking (no storage) and traditional (with storage) operations might take place.

Cross docking minimizes the need to put incoming inventory into storage and the number of “touches” for each order. To accomplish this, the receiving activity is linked with open order status. Each inbound shipment has a planned outbound already scheduled. When an item is received, the system will look to the open order file to find its outgoing order. The item is moved from receiving directly to the order staging area, order pick area, or into an outbound vehicle.

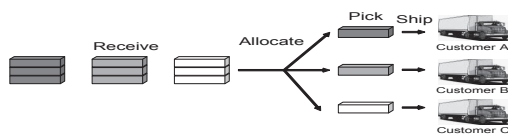
Three common types of cross docking are:

1. Trans-shipment: The order received is already packaged for delivery to the customer



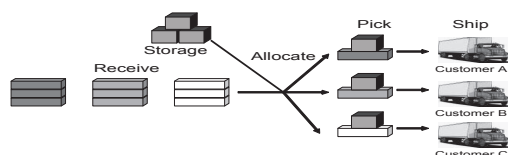
The Pennsylvania State University

2. Flow-through: Some sortation or break bulk is needed when the order is received



The Pennsylvania State University

3. Merge-in-transit: Current inventory in storage at the DC is added to the incoming order (see separate Best Practice).



The Pennsylvania State University

(Courtesy: Robert Novack, Penn State University, University Park)

SCOR Process(es)

sD1.8 (Receive Product from Source or Make), sD1.11 (Load Vehicle & Generate Shipping Documentation), sD1.12 (Ship Product)

Best Practice Need and Suitability Indicators

- Small shipment sizes (economies of scale through bundling shipments)
- Constrained distribution center capacity
- Perishability of products

Additional Comments

Suppliers usually need to make some type of investment (customized bar codes, special overpacks, or unique pallet patterns) to participate in cross-docking.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Reduces transportation costs (compared to transportation without cross-dock), because de-consolidation at cross-dock for multiple receivers allows shippers to deliver larger shipments
Asset Management	Reduces average inventory level and (as a consequence) working capital invested in inventory

Key Best Practice Success Factors

Technology Features Cross docking requires the use of a Warehouse Management System (WMS), which needs to interface with the order management system. Bar codes and RF scanners will allow the receiving function at the DC to become more productive.

The use of EDI messages, especially of ASN's (Advance Ship Notices) is highly beneficial. The shipper sends an ASN to the receiver as a notice that a shipment has been sent, allowing the receiving facility to more productively schedule order picking and outbound deliveries.

Other Success Factors None Identified

Additional Resources

None Identified

Drum-Buffer-Rope Scheduling Technique

Drum-Buffer-Rope (DBR, also referred to as Synchronous Manufacturing, or Constraint Management) is, in the Theory of Constraints (TOC), a technique used to manage resources to maximize throughput.

The Drum is the system's constraint (or bottleneck) that sets the pace for the entire organization. Such a bottleneck determines the final output of the system regardless of the excess capacity that might be available on the other resources. (In DBR terminology, the drum is also the schedule of the constraint.)

The Drum Buffer is a time offset (raw material will be released earlier than expected by the conventional lead time) that helps exploit the drum's capacity. Placing the buffer in front of the drum we reduce/absorb the impact of uncertainty along the production chain from the gating operations all the way to the constraint. The drum buffer can be seen as a powerful tool in helping us prevent the drum from starving.

The Rope is the material release schedule tied to the drum. With the rope we make sure that no material is released to the shop floor without the "prior approval" of the drum. The shop floor has a virtual rope tying the drum to the gating operations, each time the drum finishes a lot it will pull this rope to ask for more material to be released. This powerful concept (global management vs. localized approach) has an immediate impact on both lead time and WIP. Release only what is needed when it is needed!

SCOR Process(es)

sM1.1 (Schedule Production Activities), sM2.1 (Schedule Production Activities), sM3.2 (Schedule Production Activities)

Best Practice Need and Suitability Indicators

- High Work-in-progress (WIP) with deteriorating throughput
- Unpredictable manufacturing lead times (e.g. due to many prioritized production orders)
- Mature serial or mass production running at a fixed rate
- The technique is mainly suitable for machine-limited capacities.

Additional Comments

In the application of Drum-Buffer-Rope (DBR), the effectiveness of the pace setting operation (drum) is critical for maximizing throughput. The *Overall Equipment Effectiveness* (OEE) is the single metric that reflects that effectiveness. OEE is the result of multiplying

- *Availability* (up-time)
Run time divided by scheduled time (also 1 minus downtime)
- *Quality Rate* (first pass yield)
First-pass good units produced divided by total units produced
- *Performance Efficiency*
Theoretical cycle time by the actual cycle time. Theoretical cycle time should be that, which was promised by the production equipment's manufacturer. (In practice theoretical cycle time often is "downgraded" by industrial engineers applying factors such as personal fatigue and delay to derive a "standard cycle time", which is used to cost the product and provide planning an attainable capacity quantity.)

Additional Comments cont.

The difference between the OEE value and 1.0 indicates the percentage of production lost to ineffective operations. Examining the components of OEE will enable root cause analysis and direct corrective action.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Increases perfect order fulfillment, as manufacturing lead time gets more predictable
Responsiveness	Increases with decreasing manufacturing lead time
Flexibility	None Identified
Costs	Higher equipment effectiveness reduces cost of goods sold
Asset Management	Reduces WIP, leads to a higher equipment effectiveness

Key Best Practice Success Factors

Technology Features	None Identified
Other Success Factors	None Identified

Additional Resources

Cox, J. F.; Blackstone J. H. (2004): American Production and Inventory Control Society (APICS) Dictionary, 11th edition, APICS – The Educational Society for Resource Management, Alexandria, VA, USA

Goldratt, E. M., Cox, J. (1992): *The Goal – A Process of Ongoing Improvement*“, North River Press, Norwich, CT, USA

Spencer, M. S.; Cox, J. F. (1997): *The Constraints Management Handbook*, The St. Lucie Press/APICS Series on Constraints Management.

Umble, M.; Mokshagundam L. S. (1995): *Synchronous Manufacturing – Principles for World Class Excellence*, Spectrum Publishing Company.

Hansen, R. C. (2002): *Overall Equipment Effectiveness*, Industrial Press, New York, NY, USA.

Mondher, B.-H.: *Synchronous Manufacturing Quick Reference Guide*, Supply Chain Strategy and Solutions, BearingPoint, Inc.

Lean Methodology

“Lean” is a term coined in 1990 in the book “The Machine that Changed the World” by MIT researchers to describe the effectiveness and efficiency of the Toyota Production System in comparison to the traditional mass production approach to manufacturing. “Lean” practices actually date back to the early 1900’s when Sakichi Toyoda introduced jidoka (autonomation) into his loom operations. The modern understanding of “lean” comes from the Toyota Production System developed by Taiichi Ohno, which was inspired by Henry Ford’s River Rouge moving assembly line. “Lean” thinking is a focus on creating process “flow” through the reduction of waste. The waste reduction in production environments is typically targeted at the seven wastes: overproduction, waiting, transportation, inappropriate processes, inventory levels, unnecessary motion, and defects. Lean Thinking is applicable to all processes.

The typical enabler for lean improvement is through the use of Value Stream Mapping (VSM). VSM is the process of walking and drawing the process steps (material and information) for one product family from beginning to end, typically within a single facility, to create a current state map. Current state maps are designed to highlight the process flow of an item through the value stream. Following the current state map, a future state map is created. Future state maps are then developed to identify process improvements that eliminate waste. Finally, a detailed implementation plan is developed to transition from the current state to the future state, typically within an 8-12 month period. VSM can also be applied similarly across suppliers to create supply chain value stream maps.

While lean excels at improving process efficiency, there are some limitations to lean application. Lean implementations are typically limited by the inability to systematically identify and prioritize lean projects, measure the effects of changes on the supply chain system’s bottom line, and align and communicate activities across organizations. See the Best Practice on “Convergence of SCOR, Six Sigma and Lean Methodology” to overcome this limitation.

SCOR Process(es)

affects any SCOR process

Best Practice Need and Suitability Indicators

- Need for process cycle efficiency improvements
- Need to reduce process cycle times
- Elimination of non-value added process steps
- Need to build a culture of lean thinking throughout

Additional Comments

Lean is a methodology and way of thinking to transform organizations into new levels of efficiency, supported by a toolset for executing improvement projects that reduce process cycle time and increase process cycle efficiencies. Execution is enabled through people, and must become the way work is done within the organization. Application of lean tools is based on the effective use of value stream mapping. This methodology relies heavily on the ability to record all steps throughout processes and to determine value added versus non-value added activities. Lean is a methodology supported by a toolset that is generally limited by the inability to strategically select projects that provide the greatest value to the overall organization.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	enables organizations to determine how current process steps and cycle efficiencies affect overall supply chain reliability. Details can be displayed through value stream mapping.
Responsiveness	Process cycle-time decreases (typically by around 70%) through eliminating non-value added process steps. Lean organizations have the worker flexibility and adaptability to respond to surges and shocks in production.
Flexibility	Lean creates process flow and allows for quick changeover between functions, tools, and processes. Lean facilities typically have considerable cross training, which creates highly flexible teams of people and organizational layouts.
Costs	Cost reduction is a typical impact of lean as non-value added processes are removed and efficiency increases. Response times are also reduced which result in faster cash flow cycles.
Asset Management	Lean typically reduces inventory levels and ensures the efficient use of assets with regard to customer demand. Suppliers are likewise encouraged to improve cycle efficiencies to increase their available inventory for customers to pull from.

Key Best Practice Success Factors

Technology Features	Lean is people-oriented and can be successfully employed with minimal technological requirements. Some technology (e.g. a data warehouse with data extracted from an ERP source system) could potentially support an organization's application of lean.
Other Success Factors	The successful transformation to lean is marked by the change in the way people address their work. Lean thinking must become a part of how work is done within an organization to have sustainable continuous improvement.

Additional Resources

Womack, J. P., Jones, D. T. (1996): *Lean Thinking – Banish Waste and Create Wealth in Your Corporation*, Simon & Schuster, New York, NY

Suzaki, K. (1987): *The New Manufacturing Challenge – Techniques for Continuous Improvement*, Simon & Schuster, New York, NY

Keyte, B., Locher, D. (2004): *The Complete Lean Enterprise – Value Stream Mapping for Administrative and Office Processes*, Productivity Press, New York, NY

Liker, J. (2004): *The Toyota Way – 14 Management Principles From The World’s Greatest Manufacturer*, McGraw-Hill, New York, NY

Marchwinski, C., Shook, J., (2004): *Lean Lexicon – A Graphical Glossary for Lean Thinkers*, Lean Enterprise Institute, Brookline, MA

<http://www.lean.org> (Lean Enterprise Institute), <http://www.lean.mit.edu> (Lean Aerospace Initiative), <http://www.superfactory.com> (Superfactory)

Merge-in-Transit

Merge-in-transit is a practice to combine items from multiple sources into a single customer shipment. This includes items on stock in the distribution center, from which the shipment is sent, items on stock in other distribution centers, items on stock elsewhere (e.g. at a plant or a supplier) as well as make-to-order items. The items to be merged are cross-docked from inbound receipt to outbound shipping (see Best Practice on Cross-Docking, type three). Merging is usually performed in a shipper's distribution center (DC) or in a carrier's terminal.

Merge-in-transit allows the shipper to reduce its inventory levels on selected items in its DC's while still maintaining complete order integrity and reliable delivery. The practice increases overall delivery times, though. To keep delivery reliability to customers, supply chain information systems are required, which integrate among the shipper, its suppliers, and its carriers.

For make-to-order (MTO) products, the order lead time should be greater than the manufacturing lead time. Otherwise, the products should be manufactured and stocked prior to the shipment. The point is emphasized here to ensure that the proper business policy is adopted around defining MTO versus MTS (make-to-stock) products.

SCOR Process(es)

sD1.8 (Receive Product from Source or Make), sD1.9 (Pick Product)

Best Practice Need and Suitability Indicators

- Customer orders require commingling of products from different sources into a single shipment
- Order lead time is sufficient to allow collect products from their source locations

Additional Comments

Merge-in-transit is a "Place Postponement" (see Best Practice on Postponement) for parts of the supply chain.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Delivery reliability is at risk, information technology is required to keep it.
Responsiveness	Delivery time and as a consequence order fulfillment time increases
Flexibility	Allows flexibility in a make-to-order manufacturing environment, if manufacturing lead time is shorter than order lead time. DC flexibility improves because of ability to cross-dock selected inbound items.
Costs	None Identified
Asset Management	Inventory level (and as a consequence working capital) is lower, as products are kept on stock in fewer locations.

Key Best Practice Success Factors

Technology Features	This practice will require the use of some type of warehouse management system (WMS), bar code or RF scanner technology, and EDI (or some other technology that would allow the transmission of data between supply chain partners). It might also require the integration of MRP or other scheduling technology with the WMS. All will need to interface with the order management system.
Other Success Factors	<p>Agreements with suppliers and carriers on:</p> <ul style="list-style-type: none"> • Delivery time requirements • Inventory policies at the supplier locations and DC's • Packaging items to produce the combined shipment, including generation of packing slips and other documentation are required. <p>All involved parties must agree on the types and timing of information exchange. Since DC's will have lower inventory levels as a result of using this practice, extended stock-outs at suppliers or unreliable delivery times by carriers would negatively impact the customer delivery experience.</p>

Additional Resources

None Identified

Postponement

Postponement (delayed differentiation) is a supply chain concept where a product is kept as long as possible in a generic state. Differentiation of the generic product into a specific end-product is shifted closer to the consumer by postponing identity changes, such as assembly or packaging, to the last possible supply chain location.

This allows keeping safety stock of one generic product instead of multiple specific end-products. Especially in cases where the split of demand into specific end-products is uncertain, postponement with its risk pooling effect leads to less safety stock required and to a lower risk of obsolescence of end-products. Furthermore, as less value has been added to the generic product than to the specific end-product, less capital is bound in each stocked unit.

There are three ways to implement postponement:

- **Product postponement**
A modular structure of the product allows late differentiation, e.g. adding country-specific power plugs shortly before shipment.
- **Place postponement**
Safety stock is kept in one central warehouse instead of regional warehouses.
- **Time postponement**
Processes which let the product become differentiated (e.g. coloring, flashing an EPROM with software) take place as late as possible.

SCOR Process(es)

sS1 (Source Stocked Product) , sM1 (Make to Stock), sD1 (Deliver Stocked Product)

Best Practice Need and Suitability Indicators

- Significant number of variants of an end product with an uncertain split of demand on variants.
- Delivery time requested by customers must allow value-adding steps after receipt of customer orders (or reliable demand forecast).

Additional Comments

Product postponement leads to economies of scale in procurement and production as well, since the generic product will be produced in larger amounts than its variants.

Impact on Supply Chain Performance Attributes/Metrics	
Attribute	Experienced Impact
Reliability	With the same safety stock, fill rate will typically increase.
Responsiveness	Order fulfillment cycle time increases, if value-adding steps are carried out after receipt of a customer order (see need indicators)
Flexibility	Increases, because a wide range of specific end-products can be derived from the stocked generic product.
Costs	None Identified (except from economies of scale, see additional comment)
Asset Management	A lower safety stock level (without effect on fill rate) reduces fixed assets.
Key Best Practice Success Factors	
Technology Features	None Identified
Other Success Factors	For product postponement, an intelligent, modular product structure is a pre-requisite, so that logistics and/or supply chain management have to be involved in the product development process. To support the development process, logistics/supply chain management has to provide a clear estimation of the effects of product design (especially the number of variants) on production and logistics costs.
Additional Resources	
Cox, J. F.; Blackstone J. H. (2004): American Production and Inventory Control Society (APICS) Dictionary, 11th edition, APICS – The Educational Society for Resource Management, Alexandria, VA, USA	
Simchi-Levi, D.; Kaminsky, P.; Simchi-Levi, E. (1999): Designing and Managing the Supply Chain: Concepts, Strategies, and Cases, McGraw-Hill/Irwin, p. 56	

Sales and Operations Planning (S&OP)

Sales and operations planning (S&OP) is a process to develop tactical plans that provide management the ability to strategically direct its businesses by integrating customer-focused marketing plans for new and existing products with the management of the supply chain.

The process brings together all the plans for the business (sales, distribution, inventory, production, procurement) into one integrated set of plans. This set of plans typically covers – at an aggregate (product family) level – a period of 8 to 18 months with monthly periods and further years with half-year periods. S&OP is revised on a regular basis, most commonly monthly, but at least twice a year.

The process must reconcile all supply, demand, and new-product plans at both the detail and aggregate levels and tie to the business plan. It is the definitive statement of the company's plans for the near to intermediate term, covering a horizon sufficient to plan for resources and to support the annual business planning process.

Typically, Sales and Operations Planning includes four key monthly meetings:

1. Demand review (to align the sales forecasts for the next months)
2. Rough cut capacity planning review (to determine the available facilities and assess the feasibility of the production plans)
3. Pre-top Management review (to agree upon points to be escalated to top management)
4. Top Management review (to get plans authorized, issues fixed and financial plans committed).

SCOR Process(es)

sP1 (Plan Supply Chain)

Best Practice Need and Suitability Indicators

- Variability or misbalance in demand and/or supply, need to balance supply and demand across the supply chain.
- Conflicting measures and behavior in various departments
- Inventory unbalanced across the supply chain
- Asset Utilization below industry norms
- Especially important if operations are to a large extent planned to forecasts

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics	
Attribute	Experienced Impact
Reliability	Effective S&OP plans will allocate resources such that inventory is in place at the correct locations at the correct time so that when customer orders come in they can be fulfilled within normal procedures/processes
Responsiveness	S&OP points out where the supply chain has lead-time issues. It raises the visibility of lead-time problems.
Flexibility	The S&OP process makes potential issues visible early, so that changes can be made to accommodate the dynamics of the supply chain.
Costs	In particular, S&OP helps reduce the number and impact of expedites and “rush production orders” – both of which have a negative impact on supply chain costs.
Asset Management	S&OP allows an enterprise to operate much closer to target production and inventory plans, and thus leads to lower inventory levels and more efficient use of assets.
Key Best Practice Success Factors	
Technology Features	S&OP is essentially a PEOPLE process that can be achieved with minimal technology support. In some cases, Excel spreadsheets are adequate. Accessibility, accuracy and timeliness of aggregate enterprise-wide data are critical, though. Ideally strategic external data (e.g. customer forecasts, co-packer capacity/costs) would be an important asset to the S&OP process.
Other Success Factors	Managers should have visibility to the plans of all departments. They should also understand the impact of their deviations from plan on the other departments and the enterprise as a whole. Performance to plan should be measured. Top Management sponsorship and involvement is essential for the success of S&OP.
Additional Resources	

Civerolo, J.; Rice, D.: Sales and Operations Planning Handbook, Gray Research.

Six Sigma

Six Sigma is based on a philosophy of driving for near perfect process performance (3.4 defects per million opportunities for a defect) in order to satisfy customer needs and improve financial performance. Individuals can be trained in the various roles of Six Sigma, including Deployment Champions, Black, Green, and Yellow Belts. These practitioners then lead project teams made up of people from the operation through the use of the methodology to define and solve problems.

Six Sigma improvements are enabled through a rigorous methodology referred to as DMAIC (named for the phases of Define, Measure, Analyze, Improve, and Control). The DMAIC methodology for problem solving utilizes both process and statistical analyses to improve product/process quality and drive reduction of defects and variation. The methodology generally provides a systematic way to define the problem being addressed from both a process and financial impact perspective, identify potential factors impacting performance, narrow to the critical few root causes of defects or variation, and then establish procedures to implement sustained performance improvements.

A couple of apparent limitations with Six Sigma are the lack of alignment of priorities, understanding the interdependency between projects, i.e., incremental process improvements versus process redesign, and the lack of methods to develop future projects once the “initial hit lists” (pet-pains) become exhausted. See the Best Practice on “Convergence of SCOR, Six Sigma and Lean” to overcome this limitation.

SCOR Process(es)

affects any SCOR process

Best Practice Need and Suitability Indicators

- Need for significant improvements for Product Quality or defect reduction
- Need to reduce process variability

Additional Comments

Six Sigma provides a standard toolset for executing improvement projects to increase product quality and reduce defects and process variability. Execution is enabled based on the Six Sigma steps of Define, Measure, Analyze, Improve, and Control (DMAIC). Relies heavily on statistical data gathering and root cause analysis. Six Sigma is a toolset and generally lacks an organized method for project identification. Training in this methodology generally requires a costly investment.

Impact on Supply Chain Performance Attributes/Metrics	
Attribute	Experienced Impact
Reliability	Suppliers and customers focusing on defect and variability reductions will increase product quality product and perfect order fulfillment as a consequence.
Responsiveness	Improve order fulfillment cycle time by reducing number of defective products produced, held in inventory or shipped and returned for warranty. Very important for new Product development deliveries.
Flexibility	None Identified
Costs	Reduces cost as process variability is minimized or removed. Reduces product return due to defects.
Asset Management	None Identified
Key Best Practice Success Factors	
Technology Features	A data warehouse (with data extracted from ERP source system) and electronic exchange of quality data with suppliers is useful.
Other Success Factors	Teams should be set up with strong participation of the people directly working in the examined process. Six Sigma implementation should start with a small, controllable scope. Incremental learning prepares the organization for larger projects.
Additional Resources	
Tennant, Geoff (2000), "Six Sigma: SPC and TQM in Manufacturing and Services"	
Pande, Peter S., Neuman, Robert P., Cavanagh, Roland R. (2000), "The Six Sigma Way: How GE, Motorola, and Other Top Companies are Honing Their Performance"	
Pande, Peter S., Holpp, Lawrence (2001), "What Is Six Sigma?"	
Snee, Ronald D., Hoerl, Roger (2002), "Leading Six Sigma: A Step-By-Step Guide Based on Experience with GE and Other Six SIGMA Companies"	
Eckes, George (2003), "Six Sigma for Everyone"	
http://www.isspp.com/ International Society of Six Sigma Professionals (ISSPP)	

Statistical Test Count

The Statistical Test Count (STC) process is a method of validating inventory on-hand values by physically counting and reconciling a statistical sample of the entire inventory population. This sample is then extrapolated, which provides an indicative measure of entire inventory population. Furthermore, with extrapolation the net and gross percentage of error is determined.

One of the primary benefits of this process is a significant reduction in the time and manpower required to perform an audit – control over data gained with STC meets or exceeds all requirements of both internal and external auditors. In contrast to physical inventory and cycle count methods STC creates virtually no disruption to receiving/ shipping. Interim reporting allows for monitoring of early results.

STC provides a snapshot of piece count and inventory value accuracy level. Measurable results on both are achieved that can be benchmarked year-to-year, facility-to-facility, and network-to-network. Benchmarking is a proactive driver for inventory accuracy improvement.

SCOR Process(es)

sES.4 (Manage Product Inventory), sES.5 (Manage Capital Assets), sED.4 (Manage Finished Product Inventories), sED.5 (Manage Deliver Capital Assets)

Best Practice Need and Suitability Indicators

Statistical Test Count is particularly beneficial in high SKU count environments.

Additional Comments

The Statistical Test Count process is based on validated statistical theorems that meet independent auditor annual inventory validation requirements.

Impact on Supply Chain Performance Attributes/Metrics	
Attribute	Experienced Impact
Reliability	Through constant measurement and root cause analysis, use of the STC process promotes greater inventory accuracy to support perfect order fulfillment.
Responsiveness	Unlike cycle count and physical inventory methods, STC does not impede daily operations and does not require warehouse shut-down.
Flexibility	The STC process requires a low volume of counts that can be executed during off-peak times as resource availability allows.
Costs	Significant cost avoidance as a result of decreased time and manpower to perform a physical audit – implementing STC typically delivers up to a 90% cost reduction over physical inventory/cycle count methods.
Asset Management	The diagnostic capabilities of Statistical Test Count identify opportunities to recover against previous inventory shrinkage (balance sheet implications).
Key Best Practice Success Factors	
Technology Features	<p>STC uses part cost and other SKU characteristics to select a statistical sample that is indicative of the entire inventory population. STC also uses confidence intervals and other statistical tools to manage application of the program over time.</p> <p>STC does not require high investments in technology. It can be implemented with common spreadsheet software, for example.</p>
Other Success Factors	<p>The STC process delivers the greatest value in an environment of strong process discipline and commitment to continuous improvement.</p> <p>Results of the STC process should be embedded in established process disciplines to address any unexpected deficiencies through adjusted sample size and root cause analysis.</p>
Additional Resources	

Statistical Test Count is currently not well documented in literature. The following books deal with inventory accuracy in general:

Wild, T. (2004): Improving Inventory Record Accuracy: Getting your stock information right.

Brooks, R.B.; Wilson, L.W. (1995): Inventory Record Accuracy: Unleashing the Power of Cycle Counting

Supplier Performance Assessment System

“Assess Supplier Performance” is the process of measuring actual supplier performance against internal and/or external standards, providing feedback to achieve and maintain the performance required to meet the customers’ business and/or competitive needs.

The supplier management program at a representative company has six elements:

1. Viability of supplier
Financial credit rating via D & B, Risk rating associate with overall financial health.
2. Supplier Capability
Quality of supplier deliveries in PPM for Engineering programs and Production parts
3. Dependability
On time delivery for Engineering programs and Production deliveries, number of stock outs, average days of stock out
4. Responsiveness
Part lead time, inventory turns
5. Competitiveness
YTD part cost savings, number of parts on pull processes (JIT), electronic data exchange
6. Technical ability
Global reach, Engineering ability, Technology roadmaps

Each month, the source data is extracted from an ERP software for each supplier. A report card is created and communicated to suppliers. Performance data is monitored by commodity managers with the expectation that supplier responds to any variance to goals or expected results.

This supplier performance data can be used to select suppliers for a preferred supplier program. Preferred suppliers are given preference for all new business awards and supporting Engineering development programs.

SCOR Process(es)

sES2 (Assess Supplier Performance)

Best Practice Need and Suitability Indicators

- Significant expenses for raw material and semi-finished products (compared to own value-add)
- Need to reduce number of suppliers

Additional Comments

Suppliers are an external extension of the manufacturing process. In today’s competitive environment, processes rely on dependable supply streams that react quickly to variability in demand.

Impact on Supply Chain Performance Attributes/Metrics	
Attribute	Experienced Impact
Reliability	Source data is from transactions logged in ERP system. No arguments concerning their data vs. our data. Variance to goals is trigger for supplier to present corrective actions. Supplier and customer can focus on performance vs. data integrity. Detail data on delivery and quality are used to identify chronic performance issues for improvement.
Responsiveness	Improve reaction time for demand inside of lead-time. Mind share is maintained due to monthly performance scorecard. Very important for New Product development deliveries.
Flexibility	Since new business is awarded to suppliers that perform well, suppliers are in a continuous improvement mode.
Costs	Not an event, but expected throughout the year.
Asset Management	Suppliers are encouraged to improve inventory turns by implementing pull systems for their parts.
Key Best Practice Success Factors	
Technology Features	A data warehouse (with data extracted from ERP source system) and electronic exchange of performance data with suppliers is useful.
Other Success Factors	Supplier Management Process, Supplier Survey and Evaluation process, and Supplier Performance Measurement process have to be defined; Source of data, and performance expectations need to be communicated to suppliers and stakeholders in the company (buyers, engineers). For critical suppliers, a qualification process is recommended to align the operational standards with the company's requirements.
Additional Resources	
None Identified	

Vendor Managed Inventory (VMI)

VMI is a concept for planning and control of inventory, in which the supplier has access to the customer's inventory data and is responsible for maintaining the inventory level required by the customer. Re-supply is performed by the vendor through regularly scheduled reviews of the on-site inventory. The on-site inventory is counted, damaged or outdated goods are removed, and the inventory is restocked to predefined levels.

The supplier takes responsibility for the operational management of the inventory within a mutually agreed framework of performance targets, which are constantly monitored and updated to create an environment of continuous improvement.

Different styles of VMI agreements exist.

- Re-supply need not be on a scheduled basis. It can be more flexible to occur within defined conditions, e.g. any day normal business hours.
- The customer can be included in the "approval" process: The supplier could propose a replenishment (quantity, date) and the customer has to approve the order.
- Often (but not necessarily) VMI is combined with consignment. The supplier owns items until they are taken from the VMI and used, i.e. items are to be paid when they are used.

SCOR Process(es)

sP1, sP2, sP4, sS1.1, sS2.1, sS3.3, sES.7, sD1, sD1.5, sD1.6, sD2.5, sD2.6, sD3.5, sD3.6

Best Practice Need and Suitability Indicators

Similar to conventional MRP planning of inventory, VMI implies manual planning and control tasks, but shifts these tasks to the supplier. This manual effort should be invested in such items, which are valuable and for which demand is unsteady or sporadic. For less valuable items with a continuous demand order point technique and kanban are more suitable.

Additional Comments

VMI works well, where demand and inventory data is readily available, systems are integrated, and economies of scale exist with large customers. Jointly Managed Information (JMI) is a derivation of VMI to use when and where VMI is not operationally or commercially practicable.

Jointly-Managed Information is the automated collection, management, and integration of POS and inventory data into supplier inventory/materials management algorithms, independent of physical movements into the retail channel. This achieves many of the same benefits as VMI when there exists a free flow of information among retail channel partners, without introducing what can be sensitive financial relations between the parties. Retail partners often cannot or will not allow a vendor to automatically replenish them.

Impact on Supply Chain Performance Attributes/Metrics	
Attribute	Experienced Impact
Reliability	VMI helps to assure the availability of items thereby helping to ensure better on-time delivery performance as well as greater fill rates.
Responsiveness	Less time is spent waiting for items, allowing the production to operate more smoothly and quickly. With visibility of the demand cycle, you can agree to an official lead time, which can be reduced, and be predictable. Kraft, for example, realized a 15-20% reduction in lead times.
Flexibility	The supplier gains flexibility, when to re-supply, and – as a consequence – when and how much to manufacture.
Costs	Inventory level decreases by up to 20% leading to lower inventory costs. The supplier gets a clear view of demand and flexibility (see above), so that he can achieve lower variable manufacturing costs
Asset Management	Transfer of ownership of inventory and payment terms vary depending on the VMI agreement. VMI has a focus on working capital, with the goal being both parties experiencing a working capital reduction. The effect will vary depending on the details of the VMI agreement.

Key Best Practice Success Factors

Technology Features	<p>Specific capabilities must be in place for VMI to succeed. These include:</p> <ul style="list-style-type: none"> • Forecasting capability • Replenishing capability • Load building/order creation (at supplier) • Reporting capability • Electronic commerce infrastructure
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The addition of technology such as ERP and SCM applications will enhance these capabilities and hence the success of the VMI initiative. Depending on the company size, the number of suppliers and the number of items partners, technology may even be a prerequisite. In most VMI programs, technology plays a major role. Adding technology increases the complexity and cost of implementation, though.

Access to data such as inventory levels, demand and demand forecasts is essential to a successful VMI program. VMI works very well in conjunction with CPFR – Collaborative Planning, Forecasting and Replenishment.

Other Success Factors	None Identified
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Additional Resources

http://www.cpfr.org/documents/ppt/VMI_vs._CPFR.ppt (VMI vs. CPFR)

Wave Picking

Wave picking is a practice used in many DC operations to increase labor picking productivity and reduce the labor cost per pick. In some DC's, orders are scheduled to be picked when they are received. In contrast to that, Wave picking consolidates orders into "waves" where multiple orders with similar characteristics are picked at one time. Orders can be consolidated by customer, geography, or any other criteria that makes sense for the DC operation. In an operation where freight consolidation for shipping is important, wave picking can help consolidate less-than-truckload (LTL) shipments into truckload (TL) shipments.

Many times wave picking is performed in conjunction with batch picking. Batch picking aggregates similar items across orders into a single pick. For example, assume that the DC has 15 orders each containing Item A. In a single order pick environment, the order picker would make 15 separate trips to the location containing Item A. In batch picking, the order picker would make 1 trip to the location of Item A and pick 15 units. Most wave picking attempts begin with small batch picking initiatives. The combination of batch and wave picking provides the most productivity.

Wave picking, in conjunction with batch picking, increases the total travel time for each order picker, but the total time per item picked is reduced. This also allows the DC more flexibility when scheduling its order picking crew. If multiple waves are picked during the day, care must be taken to balance the number of orders across each wave as equally as possible. Waves can be planned based upon the estimated time required to complete the wave. For example, if picker productivity is 120 units per hour and the shift consists of 10 pickers, the system can release work in 1 hour blocks to make management more efficient. This makes the operation more predictable and measurable.

Wave picking increases DC picking and shipping productivity substantially. If managed appropriately, customers should receive more consistent deliveries. Wave picking

SCOR Process(es)

sD1.9 (Pick Product)

Best Practice Need and Suitability Indicators

- Low distribution center (DC) labor productivity
- High DC order pick costs
- High transportation costs
- Ideally suited for environments where many customers place large numbers of similar orders.
- Demand is fairly stable throughout the operating period (also be used where seasonality temporarily increases volume in a DC).
- Not too practical in a pallet pick environment
- Works best with single line orders with the same SKU going to multiple customers.
- Frequently seen in the retail sector where a single DC has many shipping locations, each receiving a similar product mix.
- Automated picking and conveyor systems make this practice more efficient.

Additional Comments

Waves must match the business environment for which they are being planned. Direct-to-consumer businesses might schedule waves specific to days of delivery or might have a "clean-up" wave to catch all next day orders not waved throughout the day.

Impact on Supply Chain Performance Attributes/Metrics	
Attribute	Experienced Impact
Reliability	Wave picking can increase perfect order fulfillment since there are fewer opportunities to mis-pick product.
Responsiveness	Delivery times to customer might increase (consolidation of orders into waves requires holding them for a period of time before they are picked).
Flexibility	Increases, because a wide range of specific end-products can be derived from the stocked generic product.
Costs	None (except from economies of scale, see additional comment)
Asset Management	A lower safety stock level (without effect on fill rate) reduces fixed assets.
Key Best Practice Success Factors	
Technology Features	<p>Efficient wave picking requires some type of Warehouse Management System (WMS) software to prioritize orders and allocate them to an appropriate wave. This practice also requires some type of interface with the firm's order management system and its Transportation Management System (TMS).</p> <p>Batch picking is best accomplished with an integrated sortation device that takes the results of the batch pick and creates individual orders. This is more costly from a capital investment perspective but greatly reduces operating cost and increases the consistency of throughput.</p>
Other Success Factors	<p>Acceptable lead times must be defined between the DC and its customers. This will facilitate the allocation of orders into waves.</p> <p>Training of DC workers is necessary to implement the wave picking process. Also, training will be required for sortation as a result of the batch picking process.</p> <p>Most implementations begin with a small group of customers or geographic locations. Normally, these groups should provide some level of stable demand.</p>
Additional Resources	
None Identified	

Best Practice	Definition	Process
ABC Classification	None identified	sEP.7: Manage Planning Configuration
Ability to Track Component/ Sub-Component Manufacturing Country of Origin	Component/lot tracking (lot trace- ability)	sES.8: Manage Import/Export Requirements sED.8: Manage Import/Export Requirements
Accurate and Approved Process Plans, Routings, Specifications and Procedures	Electronic document management	sM1.4: Package
Accurate and Approved Process Plans/Specifications	Electronic document management	sM2.3: Produce and Test sM1.3: Produce and Test sM2.4: Package
Accurate and Approved Work Instructions/Process Plans	Electronic document management that maintains current Standard Operating Procedures (SOP)	sM1: Make-to-stock sM2: Make-to- Order
Accurate and Low Cost Batch Records for Regulatory Compliance	Electronic batch records	sM1.6: Release Product to Deliver sM2.6: Release Finished Product to Deliver sM3.7: Release Product to Deliver
Accurate and Low Cost Batch/Configuration Records for Warranty and Regulatory Tracking	Electronic batch recording/configuration	sM1.4: Package sM1: Make-to-stock sM2: Make-to- Order sM1.3: Produce and Test sM2.3: Produce and Test sM2.4: Package
Additional Capacity for Overflow Demand	Outsource manufacturing and work force augmentation providers connected to production schedules via the internet.	sM3.2: Schedule Production Activities sM2.1: Schedule Production Activities sM1.1: Schedule Production Activities
Advance Planning Engines Applied to Returns	Advanced math model “solvers” that optimize / minimize constraints, routing, restocking priorities and costs.	sP5.3: Balance Return Resources with Return Requirements
Advanced Ship Notices Allow for Tight Synchronization between Source and Make Processes	Blanket order support with scheduling interfaces to external supplier systems	sS1.1: Schedule Product Deliveries 3: Schedule Product Deliveries sS2.1: Schedule Product Deliveries
Advanced Shipping Notice	Integrated data sharing with repair facility.	sSR3.5: Return Excess Product sSR2.5: Return MRO Product sSR1.5: Return Defective Product

Best Practice	Definition	Process
Advanced Shipping Notices & UCC128 Container Labeling	Bar coding; EDI; integrated transportation/warehouse management	sD3.13: Receive and Verify Product by Customer sD1.13: Receive and Verify Product by Customer sD1.11: Load Vehicle & Generate Shipping Docs sD2.11: Load Product & Generate Shipping Documentation sD3.11: Load Product & Generate Shipping Documents sD2.13: Receive and Verify Product by Customer
Alignment of Strategic and Business Plans with Long-Term Capacity and Resource Planning	None identified	sEP5: Manage Integrated Supply Chain Capital Assets sEP6: Manage Integrated Supply Chain Transportation
All Functions and Organizations Understand Their Impact on Supply/ Demand Balancing, Including Sales, Marketing, Product Management, Manufacturing, Customer, Suppliers, Materials Management, and Product Development	None identified	sP1: Plan Supply Chain
All Key Participants in the Supply Chain, Including Strategic Partners, Have Full Visibility of the Demand/ Supply Plan	Supply Chain Event Management Systems	sP2: Plan Source
Allow Source Suppliers Full Visibility into the Current Return Situations and the Forecasted Return Activity	Shared supply chain forecasting and event management functionality with Source suppliers	sP5.2: Identify, Assess, and Aggregate Return Resources
Appointment Scheduling for Pickup and Delivery of Customer Shipments	Transportation Management System (TMS) Maintenance Management	sED.6: Manage Transportation sES.6: Manage Incoming Product sER.6: Manage Return Transportation
Arrange for Shipping Insurance in Case Of In-Transit Loss or Damage	Preventative management	sSR3.4: Schedule Excess Product Shipment
Assessing Export/Import Requirements during Time of Product Development/ Manufacture	Multi-country Export/Import documentation compliance	sES.8: Manage Import/Export Requirements (Source) sED.8: Manage Import/Export Requirements
Attribute-Based Process Planning	Computer aided process planning / recipe management	sEM.1: Manage Production Rules

Best Practice	Definition	Process
Authorize Each Operation to Assess the Quality of the Previous Operations	None identified	sM3.4: Produce and Test sM2.3: Produce and Test sM1.3: Produce and Test
Automated Configuration Management	Configuration	sD2.2: Receive, Configure, Enter and Validate Order sM3.1: Finalize Production Engineering
Automated Conformance Monitoring And Control	Internal automatic notification of conformance, including holding of product until requirements are met	sEM.8: Manage Make Regulatory Environment
Automated Conversion of Engineering Drawings into Product Specifications	None identified	sM3.1: Finalize Production Engineering
Automated Data Entry	Scanning with RFID/Bar-codes systems	sER.5: Manage Return Capital Assets sED.5: Manage Deliver Capital Assets
Automated Directed Picking	A pick list displayed on a handheld device that directs picks and relieves inventory from backroom locations	sD4.3: Pick Product from Backroom
Automated Disposition Instructions for Returns Based on Data Interchange with Strategic Providers	Advanced planning and scheduling capability coupled with decision support logic.	sER.5: Manage Return Capital Assets
Automated Documentation for International Shipments	Transportation Management System (TMS) Maintenance Management	sER.6: Manage Return Transportation sES.6: Manage Incoming Product sED.6: Manage Transportation
Automated Engineering Specifications	Automated Intelligence (Heuristic) - based engineering specifications system	sEM.1: Manage Production Rules
Automated Inventory Visibility and Planning System to Highlight Inventory in Excess of Requirements	Automated inventory planning package linked to real time demand data and inventory business rules.	sSR3.1: Identify Excess Product Condition
Automated Links To Existing CAD & CAM Information	Electronic hypertext or links to existing database of detail/parts/setup sketches/drawings	sEM.1: Manage Production Rules
Automated Notification of Laboratory Regarding Sample Availability	Interface between production system and LIMS	sM1.6: Release Product to Deliver sM2.6: Release Finished Product to Deliver sM3.7: Release Product to Deliver
Automated Pick List	System generated pick-lists based on picking / batching rules.	sD4.2: Receive Product at the Store sD4.1: Generate Stocking Schedule

Best Practice	Definition	Process
Automated Registry of Inventory Return Locations by Item to Speed Identification of Proper Return Location	None identified	sSR3.2: Disposition Excess Product
Automated Replenishment of Back Stock Based on Minimum Stocking Levels	None identified	sD4.3: Pick Product from Backroom
Automated Statistical Process Control (SPC)	None identified	sS2: Source Make-to-Order Product
Automated Update of Customer Excess Material Return Transaction History	- Use trend analysis to influence inventory level decisions. - Web-based alerts to identify update occurred and when pre-determined thresholds are exceeded.	sER.3: Manage Return Data Collection
Automated Update of Supplier Performance Information	None identified	sES.3: Maintain Source Data
Automatic Customer Payment	RFID, smart cart or customer self-service charges goods to card upon store departure.	sD4.6: Checkout
Automatic Generation / Configuration Of Tooling / Set-Up Instructions	Parametric driven (Group Technology - based) manufacturing design system	sEM.1: Manage Production Rules
Automatic Generation And Submission Of Conformance Documents	Software specific to industry regulations and standards (e.g. may be software to produce MSDS documents, or FDA requirements, etc.)	sEM.8: Manage Make Regulatory Environment
Automatic Identification	Bar Coding & Radio Frequency Communications	sD2.8: Receive Product from Source or Make sD3.8: Receive Product from Source or Make sD1.8: Receive Product from Source or Make
Automatic Label and Seal Verification	Automatic interface to inspection systems	sM2.4: Package sM1.4: Package sM3.5: Package
Automatic Link to Recipe Management, PLC Program, CNC Program Systems, Etc., to Deliver New Manufacturing Documentation	Seamless application interface to manufacturing planning documentation and CAM systems	sEM.1: Manage Production Rules

Best Practice	Definition	Process
Automatic Multi-level Credit Checking: Dollar Limits; Days Sales Outstanding; Margin Testing	Integrated Order/Financial Management	sD1.2: Receive, Enter and Validate Order sD2.2: Receive, Configure, Enter and Validate Order
Automatic Notification When to Begin and When to Complete	Workflow/Groupware	sEM.1: Manage Production Rules
Automatic Reservation of Inventory and Dynamic Sourcing of Product for Single Shipment to Customer	Integrated order management system that treats each order line as a separate order with integration to inventory source and status; Real-time inventory management	sD1.3: Reserve Inventory and Determine Delivery Date sD2.3: Reserve Inventory and Determine Delivery Date
Available-to-Promise (ATP)	See detailed description in beginning of this chapter	sD1.3: Reserve Inventory and Determine Delivery Date sD2.3: Reserve Inventory and Determine Delivery Date
Back Flush Material at Order Completion	Flexible back flush logic	sM1.2: Issue Material sM3.3: Issue Sourced/In-Process Product sM2.2: Issue Sourced/In-Process Product
Backhaul Trading Exchange	Pooling	sER.6: Manage Return Transportation sES.6: Manage Incoming Product sED.6: Manage Transportation
Bar Coding is Used to Minimize Handling Time and Maximize Data Accuracy	- Bar code interface for data collection devices.- Generate bar coded receiving documents.- Product serial number used as identifier.- RFID	sS3.5: Verify Product sS2.2: Receive Product sS1.3: Verify Product sDR3.3: Receive Excess Product sS1.2: Receive Product sDR1.3: Receive Defective Product sS2.3: Verify Product sDR2.3: Receive MRO Product sS3.4: Receive Product
Blanket Purchase Orders Cover Period Requirements	None identified	sP2.4: Establish Sourcing Plans
Build Load in Stop Sequence	Integrated inbound/outbound transportation planning (i.e. 1st truck destination loaded last, etc.).	sD1.5: Build Loads sD2.5: Build Loads sD3.5: Build Loads
Build Subassemblies to Forecast at Highest Generic Level in Bill of Material; Maintain Flexibility While Minimizing Cycle Time and Inventory Position	None identified	sM3.2: Schedule Production Activities

Best Practice	Definition	Process
Build Subassemblies/ Products to Forecast at Highest Generic Level to Minimize Make Cycle Time	None identified	sM2: Make-to- Order
Business Intelligence (BI)	A data warehouse / data mart is the source of all planning (master) data, business rules and transaction data. Analytical tools enable the ongoing maintenance and improvement of the business rules based on actual data.	sP1.3: Balance Supply Chain Resources with SC Requirements
Business Rules Are Clearly Communicated with the Customer	Convenient availability to business rules and return criteria.	sER.2: Manage Performance of Return Processes
Capability to Run "Simulated" Full-Stream Supply/Demand Balancing for "What-If" Scenarios	Supply chain modeling and visualization system	sP1: Plan Supply Chain sEP.6: Manage Integrated Supply Chain Transportation
Capability to Run Multiple "Simulated" Full-Stream Supply/Demand Balancing Against Long-Term Capacity Plans and Scenarios	Supply Chain modeling capabilities, i.e. Advanced Planning Systems.	sEP.5: Manage Integrated Supply Chain Capital Assets sEP.4: Manage Integrated Supply Chain Inventory
Capability Transfer to Customer	None identified	sS2.4: Transfer Product
Capability Transfer to Organization	None identified	sS1.4: Transfer Product sS3.6: Transfer Product
Capacity and Supply Constraints Are Balanced Against Demand during the Planning Cycle	None identified	sP2.2: Identify, Assess and Aggregate Product Resources sP2.1: Identify, Prioritize and Aggregate Product Requirements
Capture and Maintain Mode Specific Data	Transportation Management System (TMS) Maintenance Management	sES.6: Manage Incoming Product sER.6: Manage Return Transportation sED.6: Manage Transportation
Carrier Agreement	See detailed description in beginning of this chapter	sS3.4: Receive Product sD1.11: Load Vehicle & Generate Shipping Docs sES.2: Assess Supplier Performance sES.7: Manage Supplier Network sD3.11: Load Product & Generate Shipping Documents sES.10: Manage Supplier Agreements sS1.2: Receive Product sD2.11: Load Product & Generate Shipping Documentation

Best Practice	Definition	Process
Carrier Selection Based on Performance Criteria at Least Cost	Scheduling, carrier selection, and rating	sSR2.4: Schedule MRO Shipment sSR3.4: Schedule Excess Product Shipment sSR1.4: Schedule Defective Product Shipment
Carrier/Route Optimization Based on Continuous Movement and Consolidation/Pooling	Route scheduling, carrier selection, and rating	sD2.6: Route Shipments sD3.6: Route Shipments sD1.6: Route Shipments
Categorize 100% of Total Inventory (Active, Usable, Excess, Obsolete) for Appropriate Action	None identified	sP2.1: Identify, Prioritize and Aggregate Product Requirements sP2.2: Identify, Assess and Aggregate Product Resources
Cellular and Demand Pull Manufacturing	Support for cellular and demand pull manufacturing execution	sM2: Make-to- Order
Cellular Manufacturing	Manufacturing is broken into work cells	sM3.2: Schedule Production Activities sM3: Engineer-to-Order sM1: Make-to-stock
Change in the Demand Signal Instantaneously "Reconfigures" the Production and Supply Plans	Event-driven supply chain re-planning	sP1: Plan Supply Chain
Changeover Reduction / Continuous Improvement Program	Changeover process flow element identification, instructional directions to conduct changeover, and measurement tool, which can be used to prioritize and track results of improvement efforts. Software to identify operational constraints to the MAKE processes to assist in directing resources toward bottleneck functional areas.	sES.5: Manage Capital Assets sEM.5: Manage Make Equipment and Facilities
Clarify in Advance Hazardous Material Packaging, Labeling and Shipping Requirements	Overseas packaging, labeling and shipping regulatory requirements are given specific attention.	sER.8: Manage Return Regulatory Requirements and Compliance
Clarify in Advance If the Product to be Returned Requires Specific, Formal Authorization from the Service Provider per Federal, State or Local Regulation, Prior to Returning	Participants at all customer and service provider locations involved clearly understand all regulatory requirements at each step in the return process .	sER.8: Manage Return Regulatory Requirements and Compliance

Best Practice	Definition	Process
Clarify Point of Contact and Return Location	Electronic rules for business relationships and transactions.	sSR3.3: Request Excess Product Return Authorization SR1.3: Request Defective Product Return Authorization
Collaboration among Operations Strategy Team	Supply Chain Advanced Planning Systems, Supply Chain Integration Systems, Integration between supply chain advanced planning and ERP execution systems, Supply Chain Capacity Planning Systems	sP1.1: Identify, Prioritize and Aggregate SC Requirements sP1.4: Establish & Communicate Supply-Chain Plans
Collaborative Planning, Forecasting, Replenishment (CPFR)	See detailed description in beginning of this chapter	sP1: Plan Supply Chain
Collaborative Planning/ Scheduling	Interactive, on-line planning/scheduling systems. Capacity planning systems with accurate production capability data.	sEM.7: Manage Production Network
Collaborative Review and Agreement of Business Rules Prior to Contract Execution	Web based access to current spend data available from enterprise to part level	sES.1: Manage Sourcing Business Rules
Combine Consolidation Needs with Other Products/ Divisions/Companies	None identified	sD1.4: Consolidate Orders
Communicate with Customer before the Return to Establish What Types of Returns Are Acceptable<!>	None identified	sDR1.1: Authorize Defective Product Return sDR3.1: Authorize Excess Product Return sDR2.1: Authorize MRO Product Return
Comparative Analysis of Supplier Performance is Used in Sourcing Decisions	Software application with data analysis capability	sES.2: Assess Supplier Performance
Compare Local Customs Requirements to Your Process Procedures to Ensure All Requirements Are Accounted for Before Shipping	None Identified	sER.8: Manage Return Regulatory Requirements and Compliance
Complete Lot History	Inventory by lot of sourced/in-process or discrete order /usage reporting by lot or discrete order	sM2.2: Issue Sourced/In-Process Product sM1.2: Issue Material
Comprehensive History of Customer Interactions Including Order History, Claims, Problems, Etc.	None identified	sED.3: Manage Deliver Information

Best Practice	Definition	Process
Concurrent Engineering is Used to Tightly Link Sourcing into the Product Development Process Make/Buy Decision Process (Outsourcing vs. In Sourcing)	None identified	sS3.1: Identify Sources of Supply
Confirm All Documentation and Inspection Requirements Before Shipping	None Identified	sER.8: Manage Return Regulatory Requirements and Compliance
Confirm Asset Return Condition Codes Are Clearly Understood by All Employees, Especially Those Who Are New to the Process	None identified	sSR1.2: Disposition Defective Product
Confirm Changes in Condition Code Policies Are Promptly Communicated to All Employees and Supply-Chain Partners.	None identified	sSR1.2: Disposition Defective Product
Consideration of Supplier's Material Availability in Company's Supply Resources (Including Supplier's Production Plans & Capability, Inventory, and Delivery Plans)	Digital linkage to supplier quoting, planning, configuration and customer service applications	sP3.1: Identify, Prioritize and Aggregate Production Requirements
Consignment Agreements Are Used to Reduce Assets and Cycle Time While Increasing the Availability of Critical Items	Consignment inventory management	sS3.3: Schedule Product Deliveries sS2.1: Schedule Product Deliveries sS1.1: Schedule Product Deliveries
Consolidate Orders by Customer, Source, Traffic Lane, Carrier, Etc.	Integrated load planning and building with warehouse management	sD1.4: Consolidate Orders sD2.4: Consolidate Orders
Consolidate Shipments Through Cross Docking - Coordinate with Other Shipments	None Identified	sER.6: Manage Return Transportation
Consolidation of Carriers	Transportation modeling and rate analysis	sD2.6: Route Shipments sD3.6: Route Shipments sD1.6: Route Shipments
Consolidation of Inbound and Outbound Requirements	Integrated inbound/outbound transportation planning	sD2.5: Build Loads sD1.5: Build Loads sD3.5: Build Loads

Best Practice	Definition	Process
Consolidation of Return Carriers	Outbound logistics software to assist with route.	sSR3.4: Schedule Excess Product Shipment sSR1.4: Schedule Defective Product Shipment sSR2.4: Schedule MRO Shipment
Continuous Improvement	Historical trending, cause and effect analysis, and Key Performance Indicators Scheduling reviews of processes for possible improvements	sEM.3: Manage Make Information
Continuous Improvement and Development is Driven and Measured through the Performance Review Process	None identified	sES.2: Assess Supplier Performance
Continuous Improvement is Planned through Process Reviews and Customer Feedback	Avenue to receive customer comments.	sER.2: Manage Performance of Return Processes
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	sD2.2: Receive, Configure, Enter and Validate Order sD1.2: Receive, Enter and Validate Order
Cost Accounting System to Determine the Best Return Process to Follow from a Cost of Business Perspective	ABC costing system	sP5.3: Balance Return Resources with Return Requirements
Cost Reduction and or Cost Avoidance Are Opportunities Are Identified, Implemented and Measured on a Periodic Basis	None identified	sES.2: Assess Supplier Performance
Create and Maintain Multiple Suppliers and Multiple Supplier Sites to Record Information about Individuals and Companies from Whom You Want to Purchase Catalogue Goods and Services	None Identified	sES.7: Manage Supplier Network
Cross Training/Certification	HR/certification support	sM3.2: Schedule Production Activities sM2.1: Schedule Production Activities sM1.1: Schedule Production Activities

Best Practice	Definition	Process
Cross-Docking	See detailed description in beginning of this chapter	sD3.11: Load Product & Generate Shipping Documents sD1.8: Receive Product from Source or Make sD2.11: Load Product & Generate Shipping Documentation sD3.8: Receive Product from Source or Make sD3.12: Ship Product sD2.8: Receive Product from Source or Make sD1.12: Ship Product sD1.11: Load Vehicle & Generate Shipping Docs sD2.12: Ship Product
CRP & VMI Loads Optimized for Utilization	Integration with CRP/VMI vendor systems	sD3.5: Build Loads sD1.5: Build Loads sD2.5: Build Loads
CRP/VMI	Integrated Load Building; Routing & Scheduling with Advanced Ship Notice (ASN)	sD2.6: Route Shipments sD3.6: Route Shipments sD1.6: Route Shipments
Customer Access to Online Tracking of Order Status and Shipping Information	Internet-enabled package/shipment tracking	sED.3: Manage Deliver Information
Customer Initiated Package Tracking	WEB based Shared systems	sED.2: Assess Delivery Performance
Customer Profile Drive Recognition Upon Checkout	None identified	sD4.6: Checkout
Customer Relationship and Digital Linkages (XML, EDI, Etc.) Provide Accurate Visibility into Actual Demand via Customer Forecasts, Product Plans, Production Plans, and Inventory Positions	Tightly integrated supply chain or demand planning with point of sale and customer inventory systems	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Customer Relationship Management (CRM)	Software that provides customer input and keeps the customer informed about the planning of the production and delivery process by managing all contacts and communication with the customer thorough all channels including internet and traditional sales and customer service channels.	sP1.3: Balance Supply Chain Resources with SC Requirements

Best Practice	Definition	Process
Customer Sends Receiving Advanced Shipment Notification Prior to Shipment	Electronically link Return authorization, Return schedule and shipping documents. .	sDR2.3: Receive MRO Product sDR1.3: Receive Defective Product sDR3.3: Receive Excess Product
Customer Service Data Validation Including Geo-Coding	None identified	sED.3: Manage Deliver Information
Data Accessibility across the Enterprise for Visibility by Discrete Business Units	Web based access to various levels of enterprise data	sES.3: Maintain Source Data sER.3: Manage Return Data Collection
Defective Products Scheduling Identifies Next Destination (Source, Make, or Deliver) on Return Authorization	Utilize electronic links	sDR1.4: Transfer Defective Product
Defined Stocking Levels and Criteria	None identified	sD4.3: Pick Product from Backroom
Deliveries Are Balanced Throughout Each Working Day and Throughout the Week	None identified	sS1.2: Receive Product sS2.3: Verify Product sS1.3: Verify Product sS3.4: Receive Product sS3.5: Verify Product sS2.2: Receive Product
Delivery Schedules Are Collaboratively Developed with Customers	Web-based access to plant scheduling status, collaborative data-sharing environment.	sM2: Make-to- Order sM3: Engineer-to-Order
Demand Planning, Demand Flow Leadership	Software that provides multiple data models including the business rules and metrics for the entire supply chain planning process. Algorithms use the business rules and metrics as the drivers for the planning engine.	sP1.3: Balance Supply Chain Resources with SC Requirements
Demand Priorities Reflecting Strategic Customer Relationships as Business Policies Are Automatically Followed in Allocating Resources; First-In-First-Out (FIFO) is Utilized as the Default Scheduling Priority	Rules-based distribution planning system. Trading partner agreements	sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements
Demand Pull Mechanisms	Repetitive scheduling and sequencing	sM2.1: Schedule Production Activities sM3.2: Schedule Production Activities

Best Practice	Definition	Process
Demand-Pull Manufacturing, Including Active Reduction of Manufacturing Systems Time and WIP Through the Use of Demand-Pull Mechanisms and Visual Controls	Support of demand-pull mechanisms (Kanban, replenishment signals, etc.) based on rate schedules and user-defined minimum/maximum trigger points	sM2.1: Schedule Production Activities sM1.1: Schedule Production Activities sM3: Engineer-to-Order sM1: Make-to-stock
Demand-Pull Mechanisms; Kanban Replenishment Signals from Stockroom, Intermediate Products, or Subassembly Area	None identified	sM2.2: Issue Sourced/In-Process Product sM3.3: Issue Sourced/In-Process Product sM1.2: Issue Material
Design For Production	Table of manufacturing capacities or design envelops (capacities; envelop sizes; tank, vessel or batch sizes)	sEM.1: Manage Production Rules
Design/Upgrade Production Equipment to Maximize Flexibility and Avoid Line Stoppages	Machine productivity and downtime monitoring	sM2.3: Produce and Test sM2.4: Package sM1.3: Produce and Test sM1.4: Package sM3.5: Package sM3.2: Schedule Production Activities sM3.4: Produce and Test
Develop and Clarify Mutually Understood Cycle Times to Process Return Authorizations	Clarification as to who will pay in-bound and out-bound freight cost.	sSR3.3: Request Excess Product Return Authorization sSR1.3: Request Defective Product Return Authorization
Develop Local Receiving Process Close to Repair	Minimize time spent in product movement.	sDR2.3: Receive MRO Product sDR3.3: Receive Excess Product sDR1.3: Receive Defective Product
Develop Proactive Transit Damage Programs	None Identified	sER.6: Manage Return Transportation
Digital Linkage (EDI, XML, Etc.) is Used to Provide Real-Time Demand Information and Handle Routine Transactions	None identified	sP2.4: Establish Sourcing Plans
Digital Links (XML Based, EDI. Etc.) Among Supply Chain Members	Real-time exchange of supply chain information between supply chain members collaborative planning systems, Internet Trading Exchanges, B2B Integration and Application Server Systems	sP1.4: Establish & Communicate Supply-Chain Plans sP1.2: Identify, Prioritize and Aggregate SC Resources sP1.1: Identify, Prioritize and Aggregate SC Requirements

Best Practice	Definition	Process
Direct Connection to Customs Clearance	Electronic documentation submission via EDI and/or internet.	sES.8: Manage Import/Export Requirements sED.8: Manage Import/Export Requirements
Direct Ship from Factory to Customer/Channel	Share production status with customers and transportation providers via web-based tools. Auto-Tendering for direct ship utilizing EDI/XML protocols.	sM2.5: Stage Finished Product sM1.5: Stage Product sM3.6: Stage Finished Product
Direct Transfer of Documents to Recipient and Forwarder	Electronic documentation submission via EDI and/or internet.	sED.8: Manage Import/Export Requirements sES.8: Manage Import/Export Requirements
Direct Transfer of Documents to Recipient and Forwarder	Bi-directional Digital Links (XML, EDI, etc) or Internet procurement networks to customer service linkage	sP2: Plan Source sP4: Plan Deliver
Distinct and Consistent Linkages Exist to Ensure Disruptions and Opportunities in Material Resources Are Quickly and Accurately Communicated and Acted Upon	Multi-plant supply/demand planning and execution	sP3: Plan Make
Document Control	Control who can create, revise and access information	sEM.1: Manage Production Rules
Documents Generated Automatically During Shipment Preparation.	Electronic documentation submission via EDI and/or internet.	sES.8: Manage Import/Export Requirements sED.8: Manage Import/Export Requirements
Download P.O. & Advanced Ship Notices for Automated Receiving and Put Away	Integration with Procurement Systems & Electronic Commerce with Vendors	sD1.8: Receive Product from Source or Make sD3.8: Receive Product from Source or Make sD2.8: Receive Product from Source or Make
Drive Deliveries Directly to Stock or Point-Of-Use in Manufacturing to Reduce Costs and Cycle Time	Pay on receipt. Specify delivery location and time (to the minute).Specify delivery sequence	sS1.4: Transfer Product sS2.4: Transfer Product sS3.6: Transfer Product
Drive Returns Directly to Return Stock Point of Disposition to Reduce Cost and Cycle Time	Specify return disposition location and time.	sSR3.2: Disposition Excess Product sSR1.2: Disposition Defective Product
Drum-Buffer-Rope Scheduling Technique	See detailed description in beginning of this chapter	sM3.2: Schedule Production Activities sM2.1: Schedule Production Activities sM1.1: Schedule Production Activities

Best Practice	Definition	Process
Dunnage Control	System data field to specify where the part / product shipping container should be removed. Best practice is to remove the dunnage as soon as possible unless part / product damage will result. Reuse of intermediate WIP containers for finished goods.	sEM.4: Manage In-Process Products
Dynamic Deployment Based on Constraint Based Planning and Optimal Scheduling	Advanced planning and scheduling logic with constraint, cost, and resource optimization	sD2.3: Reserve Inventory and Determine Delivery Date
Dynamic Location Assignment Including Lot Control, Zoned Picking, Quality Assurance	Real time inventory control, stock locator, and rules based picking logic	sD3.8: Receive Product from Source or Make sD3.9: Pick Product sD2.9: Pick Product sD2.8: Receive Product from Source or Make sD1.9: Pick Product
Dynamic Location Assignment Including Lot Control, Zoned Put Away, Quality Assurance, ABC Frequency of Access	Real time inventory control, stock locator, and rules based put away logic	sD1.8: Receive Product from Source or Make
Dynamic Return Restocking Management	Dynamic prioritization of restocking plans in order to rapidly re-sell products that are in demand thus reducing new inventory demand.	sP5.3: Balance Return Resources with Return Requirements
Dynamic Simulation of Picking Requirements Optimized for Labor, Cost, and Time	Rules based picking logic and simulation	sD3.9: Pick Product sD2.9: Pick Product sD1.9: Pick Product
EDI Links between Manufacturing and Distributor to Achieve Visibility of Complete Finished Goods Inventory and Expected Shipments	None identified	sD1.3: Reserve Inventory and Determine Delivery Date
EDI Links Integrate Supplier Resource Information (Inventory, Capacity Availability, Etc.) with Own Resources	Inter-company resource planning with EDI/Internet communication	sP2: Plan Source
Efficient and Effective Benchmarking Process Leveraging Cross Industry Metrics and Definitions	None identified	sEP.2: Manage Performance of Supply Chain

Best Practice	Definition	Process
Efficient Consumer Response (ECR); Quick Response	Demand Planning, Deployment, Scheduling	sD1: Deliver Stocked Products
Electronic Catalogues/Malls	None identified	sD1: Deliver Stocked Products
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	sD1.2: Receive, Enter and Validate Order sD2.2: Receive, Configure, Enter and Validate Order
Electronic data collection of completion, quality, lot trace ability, scrap, and labor data	Reduce non-value added paperwork while still maintaining process metrics	sm3.5: Package
Electronic Data Interchange Can Be Used To Send Rfq's and Technical Information to and from Potential Suppliers to Determine Supplier Capability to Fulfill Requirements So that They May Be Added to Supplier Network	Electronic Data Interchange	sES.7: Manage Supplier Network sS3.2: Select Final Supplier (S) and Negotiate
Electronic Data Interchange is Used to Send Technical Information to and from Potential Suppliers	None identified	sS3.1: Identify Sources of Supply
Electronic Documentation and Imaging	Graphical display of drawings, diagrams, recipes/formulas, specifications, instructions, etc., to all users	sEM.1: Manage Production Rules
Electronic Generation and Download of Shipping Documents	None identified	sD2.11: Load Product & Generate Shipping Documentation sD1.11: Load Vehicle & Generate Shipping Docs sD3.11: Load Product & Generate Shipping Documents
Electronic Manifest and Electronic Billing	Transportation Management System (TMS) Maintenance Management	sER.6: Manage Return Transportation sES.6: Manage Incoming Product sED.6: Manage Transportation
Electronic Matching Between POS Data and Store Inventory (Shelves and Back Room)	Integrated Software Systems	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements

Best Practice	Definition	Process
Electronic Material Move Transactions	Automated process control and/or barcode data collection	sM3.3: Issue Sourced/In-Process Product sM2.2: Issue Sourced/In-Process Product sM3.6: Stage Finished Product sM1.2: Issue Material sM2.5: Stage Finished Product sM1.5: Stage Product
Electronic Reminders of Possible Scheduled Maintenance	Pull signals.	sER.1: Manage Business Rules for Return Processes
Electronic Sourcing and Negotiation	Business Rules for electronic sourcing process and hierarchy	sES.10: Manage Supplier Agreements sES.1: Manage Sourcing Business Rules
Electronic Transfer of Shipment Information to Finance	None identified	sD3.15: Invoice sD2.15: Invoice sD1.15: Invoice
Electronically Track Shipment from Customer to Service Provider	None Identified	sDR1.3: Receive Defective Product sDR3.3: Receive Excess Product sDR2.3: Receive MRO Product
Eliminate "Special Deals" Sales to Reduce Returns and Improve Forecast Accuracy (Reduces Uncertainty, Lowers Safety Stock Requirements, Cheaper to Administer)	None identified	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Enable Customer-Service Representatives to Complete the Bill Of Lading for the Customer Including Carrier Routing, Weight, Description and Class to Minimize Guesswork & Wrong Estimates	Clarification of policy if authorizations are not processed within the expected cycle time.	sSR1.3: Request Defective Product Return Authorization sSR3.3: Request Excess Product Return Authorization
Enable Real-Time Visibility into Backlog, Order Status, Shipments, Scheduled Material Receipts, Customer Credit History, and Current Inventory Positions	None identified	sD1.2: Receive, Enter and Validate Order sD2.2: Receive, Configure, Enter and Validate Order
Enterprise Level Policies/ Rules with Local Execution	Web based access to enterprise level business rules	sSR3.1: Identify Excess Product Condition sSR1.1: Identify Defective Product Condition sES.10: Manage Supplier Agreements sES.1: Manage Sourcing Business Rules

Best Practice	Definition	Process
Enterprise Level Spend Analysis	None identified	sES.10: Manage Supplier Agreements sES.1: Manage Sourcing Business Rules
Establish Designated Processes for Scheduling and Receiving Excess Inventory	None Identified	sDR3.2: Schedule Excess Return Receipt
Establishment of Criteria to Rank Suppliers	Utilize supplier delivery, quality, price performance as well as any other criteria such as terms and conditions	sES.7: Manage Supplier Network
Evaluate Supplier Network for Duplicates	Supplier Merge Programs for duplicates	sES.7: Manage Supplier Network
Evaluate the Benefits of Out-Sourcing the Excess Material Return Process	Enables customer to focus on core competencies.	sER.1: Manage Business Rules for Return Processes
Excess Products Scheduling Identifies Next Destination (Source, Make, or Deliver) on Return Authorization	Utilize electronic links	sDR3.4: Transfer Excess Product
Facility & Equipment Environmental / Safety Audit System	System software to list checklist items, report results of audit & forward actions to be taken	sEM.5: Manage Make Equipment and Facilities sES.5: Manage Capital Assets
Facility Master Plan	Automated Item Cubing and Weighting systems	sED.5: Manage Deliver Capital Assets
Factory Floor Electronic Decision Making Information System	Software to capture actual performance history / costs of operations with capability of predicting "best cost action plans" relating to maintaining equipment and facilities.	sEM.5: Manage Make Equipment and Facilities
First In - First Out	Part / WIP location by date received for those parts that must be stocked or staged in a holding area	sM.4: Manage In-Process Products (WIP)
Forecasts Are Replaced with Actual Customer Replenishment Signals and Orders Where Possible	B2B Integration and Application Server Systems	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Full Internal (And External If Source Suppliers Share in the Return Process Responsibilities) Visibility to Return Plans	Intranet and Extranet communications tools	sP5.4: Establish and Communicate Return Plans

Best Practice	Definition	Process
Full Visibility of Credit History by Shipping Personnel	None identified	sD3.11: Load Product & Generate Shipping Documents sD1.11: Load Vehicle & Generate Shipping Docs sD2.11: Load Product & Generate Shipping Documentation
Genealogy Tracking	Where-used listing of as-planned vs. as-built documentation	sEM.1: Manage Production Rules
Goals / Performance Plans	None identified	sD4.7: Deliver and/or Install
Ideal Stock Position Based on Days/Weeks of Supply	Pilot by Wal-Mart. IT	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Identification of Suppliers Who Will Participate in Kanban Programs	Electronic Kanban Support	sES.7: Manage Supplier Network
Identification of Suppliers Who Will Participate in Procurement Split (Two or More Suppliers Sharing Purchase Requirements) Programs	None identified	sES.7: Manage Supplier Network
Identification of Suppliers Who Will Participate in Vendor Managed Inventory (VMI) Programs	Supplier managed inventories with scheduling interfaces to external supplier systems to replenish	sES.7: Manage Supplier Network
Implement Employee Involvement Programs	None Identified	sM3.4: Produce and Test
Incorporates leading practices such as Efficient Consumer Response, Collaborative Planning, Forecasting, and Replenishment, Vendor Managed Inventory, and real time point of consumption reporting.	None Identified	sEP.7: Manage Planning Configuration
In-Process Product (WIP) Handling Rules	Tracking, genealogy	sEM.4: Manage In-Process Products (WIP)
Integrate Return Planning with Maintenance and Inventory Planning to Optimize the System	Both customer and Service Provider departments are alerted at the same time and viewing the same information.	sDR2.2: Schedule MRO Return Receipt sDR1.2: Schedule Defective Return Receipt

Best Practice	Definition	Process
Integrated Business and Supply-Chain Planning Processes Where Cross-Functional Input is Leveraged to Set Business Rules	Supply Chain performance dashboard capability.	sEP.1: Manage Business Rules for Plan Processes
Integrated Credit Checking	Interface to supplier's shipping system to financials	sD2.11: Load Product & Generate Shipping Documentation sD1.11: Load Vehicle & Generate Shipping Docs sD3.11: Load Product & Generate Shipping Documents
Integrated Demand and Supply Planning - Demand Planning, Supply Planning and especially the Supply Plan Execution Are no longer disconnected. All required planning and execution data is integrated and shared in between all functional areas within an organization.	Memory based planning systems provide one single data model and data mart (including the business rules) for the entire supply chain planning and execution process. Algorithms use the business rules as the driver for the planning engine.	sEP.3: Manage Plan Data Collection
Integrated Edit at Order Entry Time	Customer Master Record	sED.1: Manage Deliver Business Rules
Integrated Facility Management	None identified	sED.7: Manage Product Life Cycle
Integrated Order Management, Warehouse Management, and Transportation Management Systems View for analysis for all orders and shipments the following data: Logistics, Product, Cost, GL Charging	Transportation Management System (TMS) Maintenance Management	sES.6: Manage Incoming Product sED.6: Manage Transportation sER.6: Manage Return Transportation
Integrated Transportation Visibility	- Advanced shipping notices - Real time shipping tracking	sER.5: Manage Return Capital Assets
Internet Exchanges	Internet Exchanges are a hosted, business-to-business trading network. Exchanges are an open procurement network, accessible to any buyer and focused on new Internet-enabled purchasing models like spot buys or reverse, buyer-driven auctions. Exchanges will also support more traditional catalog-based sales.	sES.7: Manage Supplier Network

Best Practice	Definition	Process
Internet Ordering	None identified	sD1: Deliver Stocked Products
Internet Pooling (Electronic brokerage of shipments)	Internet Pooling (Electronic brokerage of shipments)	sED.6: Manage Transportation sER.6: Manage Return Transportation sES.6: Manage Incoming Product
Inventory Allocation Exception Process is Clearly Defined and Jointly Owned by Manufacturing and Sales	None identified	sD1.3: Reserve Inventory and Determine Delivery Date
Inventory is Planned at the Part Level, Based on Supply and Demand Variability	None identified	sP2.2: Identify, Assess and Aggregate Product Resources
Inventory Performance is Measured at the Dollar and Unit Levels	None identified	sP2.2: Identify, Assess and Aggregate Product Resources
Inventory targets Are Reviewed and Adjusted Frequently	Digital Linkages using XML standards (RosettaNet, eBXML, OAGI) to automatically query inventory levels.	sP3.3: Balance Production Resources with Production Requirements sP3.2: Identify, Assess and Aggregate Production Resources sP2.2: Identify, Assess and Aggregate Product Resources
Involve Your Other Supply-Chain Partners If Possible to Leverage Transportation throughout the Chain	Utilization of transportation management system (TMS) to manage returns. Maximization of TMS use, both intra and inter-company within the supply chain.	sR.6: Manage Return Transportation
Item/Shelf Scanning Upon Put-A-Way	Scan store shelves / bar codes to confirm put-a-way.	sD4.4: Stock Shelf
Items Are Relieved from Inventory When Item is Removed from Shelf	RFID, smart cart or customer self-service reduces system inventory upon item pick.	sD4.5: Fill Shopping Cart
JIT Environment	Schedule visibility, on-line communications between source and demand	sEM.7: Manage Production Network
Joint Service Agreements (JSA)	Collaborative Planning Systems	sS2: Source Make-to-Order Product sP1.2: Identify, Prioritize and Aggregate SC Resources sS3: Source Engineer-to-Order Product sS1: Source Stocked Product sP1.4: Establish & Communicate Supply-Chain Plans sP1.1: Identify, Prioritize and Aggregate SC Requirements

Best Practice	Definition	Process
Joint Service Agreements to Document Acceptable Service Levels in Terms of Installation Costs, Installation Cycle Time, Etc.	Collaborative planning tools with the Source suppliers.(This would be effective between customer and supplier, and between internal functions such as Field Service, Manufacturing, Marketing and Order Management)	sD2.14: Install Product sD1.14: Install Product
Joint Service Agreements with Source Suppliers to Share Responsibilities and Costs of Returns	Collaborative planning tools with the Source suppliers	sP5.2: Identify, Assess, and Aggregate Return Resources
Joint Service Agreements with Suppliers Define the Levels of "Flexibility" or Resource Upside Available Within Stated Lead Times and Agreed Upon Conditions	None identified	sP2: Plan Source
Just-In-Time Demand Flow Techniques	Demand-pull mechanisms	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test
Labor Scheduling that Matches Product Flow	Workforce management solution with flexible rules.	sD4.1: Generate Stocking Schedule sD4.2: Receive Product at the Store
Lead Times Updated Monthly	None identified	sP1.2: Identify, Prioritize and Aggregate SC Resources
Lean Manufacturing	Use a team based systematic approach to identifying and eliminating wasteful, or non-value adding activities within your manufacturing organization	sM1: Make-to-stock
Limit the Number of Carriers, Treat Them as Partners and Build a Strong Relationship with Each One Geared Toward Continually Improving Service and Lowering Cost	Utilization of transportation management system (TMS) to manage returns. Maximization of TMS use, both intra and inter-company within the supply chain.	sER.6: Manage Return Transportation
Link Individual Performance to Organizational and Divisional Goals	None identified	sM2: Make-to- Order sM1: Make-to-stock sM3.4: Produce and Test
Long Term Supplier Agreements/Partnerships	Electronic rules for business relationships and transactions: Vendor-managed Inventory Agreements, Fab & Hold Agreements, Just-In-Time Agreements.	sES.10: Manage Supplier Agreements sES.1: Manage Sourcing Business Rules

Best Practice	Definition	Process
Long-Term Return Agreements / Partnerships	None identified	sSR1.3: Request Defective Product Return Authorization sSR3.3: Request Excess Product Return Authorization
Loyalty Card Data	Use for comparison to previous sales activity/track new consumers, etc.	sD4.5: Fill Shopping Cart
Maintain Accurate Lot/Batch History Information	Electronic data collection of employee actions and sourced/in-process product lot used	sM2.3: Produce and Test sM3.4: Produce and Test sM1.3: Produce and Test
Maintain Data and System Integrity by Ensuring Production Data, Inventory Levels, and Schedule Requirements Are 99+% Accurate	Detailed production model that synchronizes PLAN and MAKE activities in real time.	sM1.1: Schedule Production Activities sM2.1: Schedule Production Activities
Maintaining Repository of Current Regulatory Requirements	Electronic subscription and publication of conformance documentation. Electronic Document Management System features.	sEM.8: Manage Make Regulatory Environment
Manage Information Across 100% of Shipments	Transportation Management System (TMS) Maintenance Management	sED.6: Manage Transportation sES.6: Manage Incoming Product sER.6: Manage Return Transportation
Master Production Scheduling Reflects Management of Capacity and/or Supply Constraints	None identified	sP2.1: Identify, Prioritize and Aggregate Product Requirements
Matching Shelf Stock to Expectations	A software based system that corrects shelf inventory levels based on actual product present (possible RFID solution). Identifies stock-outs from shrinkage or item misplacement.	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Maximize Data Integrity and System Accuracy by Ensuring 99%+ Accuracy of BOM Configuration, Inventory Levels, and Schedule Requirements	None identified	sM3.2: Schedule Production Activities
Measure Customer Service	Advanced Shipping Notices (ASN) Parcel and Container Routing and Rating Compliance Labeling Real time shipment tracking	sED.5: Manage Deliver Capital Assets
Measured and Compared with Same Activity Previous Period	DSS or portal tool that shows previous period performance and comparison for store management (whether it is a year ago, period ago, etc.).	sD4.5: Fill Shopping Cart

Best Practice	Definition	Process
Measurement of Carrier Performance for On-time Delivery and Completeness	Transportation Management System (TMS) Maintenance Management	sER.6: Manage Return Transportation sED.6: Manage Transportation sES.6: Manage Incoming Product
Measurement, Monitoring and Adjustment of Service or Product Installation	None identified	sD4.7: Deliver and/or Install
Measuring Process Metrics and Feedback to Operators	Electronic data collection of completion, quality, scrap, labor and equipment data and dissemination of information on factory floor	sm1.3: Produce and Test
Mechanical (Kanban) Pull Signals Are Used to Notify Suppliers of the Need to Deliver Product	Electronic Kanban support	sS2.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries sS1.1: Schedule Product Deliveries
Merge-in-Transit	See detailed description in beginning of this chapter	sD1.8: Receive Product from Source or Make sD1.9: Pick Product
Migrate From Build to Stock to Configure to Order; Build Subassemblies to Forecast at the Highest Generic Level in the Bill of Material/ Recipe/Formula	None identified	sm1: Make-to-stock
Minimize Capital Assets Required and Maintenance Costs	Outsourcing strategies including the use of Application Service Providers (ASPs), web-based maintenance/diagnostic assistance and MRO parts.	sEM.5: Manage Make Equipment and Facilities
Minimize Operator Induced Errors	Automatic download of production equipment with setup parameters Graphical display of setup, changeover, or layout	sm2.4: Package sm3.5: Package sm1.4: Package
Minimizing In-Process Product (WIP)	WIP Storage Management System Efficient Space Utilization Implementing Pull Systems	sEM.4: Manage In-Process Products (WIP)
Minimum Product Handling	Move high frequency used inventory close to point of use. For example, the system should provide the frequency of picks by part number so that high frequency picks can be moved to convenient locations or part pick quantities increased.	sEM.4: Manage In-Process Products (WIP)
MRO Scheduling Identifies Next Destination (Stores or Repair Station) on Return Authorization	Utilize electronic links	sDR2.4: Transfer MRO Product

Best Practice	Definition	Process
Multi-country Export/ Import documentation compliance	None identified	sED.8: Manage Import/Export Requirements
Multiple Locations Throughout Store	Planned and tracked via a plan-o-gram system; Location specific product labeling.	sD4.5: Fill Shopping Cart
New Items Introductions Are part of the Sales and Operations Planning Process at the General Management Business Team Level	None identified	sEP.7: Manage Planning Configuration
Note and Communicate Shelf Life Requirements Carefully Before Shipping	Hazardous material regulations are given specific attention.	sER.8: Manage Return Regulatory Requirements and Compliance
Notification of Existing/ Future Event or Promotions	None identified	sD4.6: Checkout
Obsolete Inventory is Reviewed at the Part Number Level	None identified	sP2.2: Identify, Assess and Aggregate sProduct Resources sP3.2: Identify, Assess and Aggregate Production Resources sD4.4: Stock Shelf
Off Peak Stocking	The majority of stocking is completed with minimal impact to or visibility from the customer.	sD4.4: Stock Shelf
On Demand Access of Supplier/Source Data	Web based access to current supplier/ source data	sES.3: Maintain Source Data
On Line Access and Notification of Tooling and Equipment Information	Delivery of tooling and equipment details drawings	sEM.1: Manage Production Rules
On Line Document Management and Automated Supplier Approval Processes Can Reduce the Cycle Time and Costs Associated With Managing Supplier Evaluations and Get Them into the Supplier Network Faster	ERP	sS3.2: Select Final Supplier (S) and Negotiate sES.7: Manage Supplier Network
On Line RFQ Processes Linked into the Document Management Process Reduces Cycle Time and Product Management Costs	None identified	sS3.2: Select Final Supplier (S) and Negotiate sS3.1: Identify Sources of Supply

Best Practice	Definition	Process
On-Demand Access of Production Information	Data Collection and Display Systems designed for efficient performance of value-added operations in production. This could include using PLC, Machine Interface, bar code, Radio Frequency Communication, Radio Frequency Identification, Magnetic Stripe, Smart Cards, etc., to enable data collection	sEM.3: Manage Make Information
On-Demand Access to Available to Promise (ATP), Production Schedules and Inventory Status by Internal Operations and Customers	None identified	sEM.3: Manage Make Information
On-Line Availability to Supplier Financials to Determine Potential Supplier Viability to be Added to Supplier Network	Internet web sites for financial evaluation	sES.7: Manage Supplier Network sS3.2: Select Final Supplier (S) and Negotiate
Online Real-Time Customer Entry and Edit	On-line Customer Service Module CRM (Customer resource Management) software is getting a big push in the E-Commerce/E-Business areas and generally provides a means to fulfill this requirement	sED.3: Manage Deliver Information
On-Line Rule Base	None identified	sED.1: Manage Deliver Business Rules
On-Line Visibility of All Supply-Chain Demand Requirements and Resources, both Currently Available and Committed (Pegged)	Enterprise resource planning system Customer relationship management system	sP1: Plan Supply Chain
Operations and Network Analysis	None identified	sED.7: Manage Product Life Cycle
Optimize Packing	No packing and unpacking time required. Recyclable or no containers where appropriate. No discarded material.	sEM.4: Manage In-Process Products (WIP)
Optimized Supply-Chain Processes, Optimized Supplier Count, Supplier and Part Rationalization	Web based access to preferred and recommended suppliers, supplier performance data & spend data stratified by commodity, business unit/site, supplier, part type, process type	sES.10: Manage Supplier Agreements sES.1: Manage Sourcing Business Rules

Best Practice	Definition	Process
Order Entry is Organized by Customer Segment Customers Receive Differentiated Service Based on Volume of Business Customer Team is Empowered to Fully Service Customer Requests, Including Formal Orders and Ad Hoc Requests Customers Have One Point of Contact for All Products	None identified	sD2.2: Receive, Configure, Enter and Validate Order
Organize to Enhance Flexibility: Few Job Classifications, Self-Directed Work Force, Flat Management Structure, Cross-Functional Work Teams	Support for modular skills inventory with links to training databases, compensations systems, and operator instructions	sM2: Make-to- Order sM3: Engineer-to-Order sM1: Make-to-stock
Outsource If Not a Core Competency	Use 4PL to manage and move.	sER.5: Manage Return Capital Assets
Packaging Operation is an Integral Part of the Overall Production Process	None identified	sM3.5: Package sM1.4: Package sM2.4: Package
Paperless Order Tracking and Customer Visibility of Orders	Electronic dispatch and data collection with external interface to internet.	sM3: Engineer-to-Order sM2: Make-to- Order sM1: Make-to-stock
Paperless Production Control	Electronic dispatch of operations	sM1.3: Produce and Test sM3.5: Package sM3.4: Produce and Test sM2.4: Package sM1.4: Package sM2.3: Produce and Test
Paperless Production Order and Inventory Tracking	Electronic dispatch and data collection. Allow customer access to production status and inventories using internet technologies and web site features.	sM1: Make-to-stock
Partnership with Outside Design Firms to Provide Skills and Capacity, as Needed	None identified	sD3.1: Obtain and Respond to RFP/RFQ
Pay on Receipt	Electronic Invoice Processing	sS2.5: Authorize Supplier Payment sS3.7: Authorize Supplier Payment sS1.5: Authorize Supplier Payment

Best Practice	Definition	Process
Performance Expectations and Business Rules Are Clearly Communicated Prior to the Initiation of Business with the Supplier	Web based access / availability to business rules and performance criteria	sES.2: Assess Supplier Performance
Performance Results that Are Compared to Benchmarks (i.e. Capacity, Scheduling) and Readily Available to Employees	Data warehouse, report writing, real time database and Executive Information systems that are easily accessible. Use of web-based technologies for dissemination of information.	sm1: Make-to-stock
Periodic Review of Metrics and Strategy with Comparisons to Industry Benchmarks	Real time view of data.	sED.4: Manage Finished Goods Inventories sER.4: Manage Return Inventory sES.4: Manage Product Inventory
Periodic Review of Standards	Process for establishing and maintaining review schedules	sEM.2: Manage Production Performance
Planning and Forecasting Outsourced Return process	Collaborative planning and forecasting with RETURN outsourcing partners (3PL, reverse drop shippers, etc.)	sP5: Plan Return
Planogram Flexibility for Seasonal/Promotional changes	None identified	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Plans that Violate Business Rules (e.g. Joint Service Agreements) Are Addressed Cross-Functionally, Considering Total Business Impacts (Revenue, Cost, Quality, Customer Service, Etc.)	None identified	sP4.4: Establish Delivery Plans
Plans Which Do Not Violate Business Rules Are Communicated Openly and Cross-Functionally for Execution	None identified	sP4.4: Establish Delivery Plans
Posted Performance Results	Data warehouse, report writing, real time data base and EI systems	sm3: Engineer-to-Order sm1: Make-to-stock sm2: Make-to- Order
Postponement	See detailed description in beginning of this chapter	sD1: Deliver Stocked Products sm2: Make-to- Order sm1: Make-to-stock sD2: Deliver Make-to-Order Product

Best Practice	Definition	Process
Postponement and Pre-Kitting Of Accessories into Modular Packages that Allow Flexibility While Maintaining Control	None identified	sM3.5: Package sM2.4: Package sM1.4: Package
Pre-Certify Supplier Capability to Send Return Products Correctly to Minimize the Need for Receipt Verification	- Push inspection to SOURCE - Receiving quality criteria connected to ISO 9000 practices	sDR3.3: Receive Excess Product sDR2.3: Receive MRO Product sDR1.3: Receive Defective Product
Pre-Defined Manufacturing Design Rules	Libraries of manufacturing capabilities or design envelopes	sEM.1: Manage Production Rules
Predictive Maintenance Monitoring (Heat, Noise, Lubrication Composition & Vibration)	Database for equipment to contain expected results of analysis, allow entry of test readings, and have capability of generating desired reports, which could highlight suggested actions based upon readings obtained, track maintenance completed, contain a help-file to be consulted	sEM.5: Manage Make Equipment and Facilities
Priority-Based Inventory Reservations, for Key Customers, with FIFO Allocation for All Others	None identified	sD1.3: Reserve Inventory and Determine Delivery Date
Proactive Education of Customers to Set Expectations and Encourage Close Working Relationships (Knowledge of Long-Lead Items, Visibility to Supply Resources, Agreement on Levels of Flexibility)	None identified	sP4: Plan Deliver
Produce Products to Unique Customer Requirements	Order entry specifications linked to manufacturing order	sM2.1: Schedule Production Activities sM1.1: Schedule Production Activities sM2: Make-to- Order
Product Data Management & Electronic Document Management Are Used to Manage Technical Documents and Requirements for Engineer to Order Product	None identified	sS3.1: Identify Sources of Supply
Product Design Collaboration with Customers	On-line design tools facilitated by internet connections.	sM3: Engineer-to-Order

Best Practice	Definition	Process
Production Level Loading	Capacity planning	sM1: Make-to-stock sM2: Make-to- Order
Production Reporting/ Status	Real time monitoring of production status and In-Process Product (WIP)	sEM.7: Manage Production Network
Proof of Performance (Promotion Management)	Scan store shelves / bar codes to confirm put-a-way. Scan using handheld and match with ad.	sD4.4: Stock Shelf
Provide Continuous Formal Training to Employees	Examples would be TQM, Six Sigma.	sM1.3: Produce and Test sM1: Make-to-stock sM3.4: Produce and Test sM2: Make-to- Order
Provide Product or Service Training to Employees or FAQ's Online	None identified	sD4.7: Deliver and/or Install
Provide Scheduling Output Back to Material and Labor Planning Systems	Allow dynamic re-synchronization of MAKE activities by tying in real time status information to scheduler	sM1.1: Schedule Production Activities
Provide Single Source of Information on the Customer (Single Group / Owner Responsible for Accuracy / Quality of Customer Data)	Secure E-Commerce Server and integrated Order Management System (OMS) Warehouse Management System (WMS) and Transportation Management System (TMS)	sED.3: Manage Deliver Information
Provide Visibility to and Quickly Escalate Delinquent Accounts for Resolution	Integrated accounts receivables	sD1.15: Invoice sD3.15: Invoice sD2.15: Invoice
Publish Return Policy	Easy access to return business rules.	sER.1: Manage Business Rules for Return Processes
Push Product on Trailer Arrival	System prioritization of items coming off trucks vs. picked from back room.	sD4.2: Receive Product at the Store sD4.1: Generate Stocking Schedule
Push-Based Forecasts Are Replaced with Customer Replenishment "Pull-Based" Signals	Standards Based (RosettaNet, eXML, OAGI, etc) B2B integration tools and systems	sP1.1: Identify, Prioritize and Aggregate SC Requirements
Quote Capability, without Reserving Inventory, Which Can Be Converted into an Order in a Single Step	None identified	sD1.1: Process Inquiry and Quote sD2.1: Process Inquiry and Quote
Quote Capability, without Reserving Inventory, Which Can be Converted into an Order, But Does Not Generate Build Signal or Reserve Inventory Capacity	None identified	sD2.1: Process Inquiry and Quote

Best Practice	Definition	Process
Rapid Reconfiguration of Return Capacity	Use of RETURN tracking and projection systems and flexible partner agreements that allow the rapid addition of RETURN capacity to match unexpected demand.	sP5.2: Identify, Assess, and Aggregate Return Resources
Rapid Replenishment, VMI, EDI	None identified	sD1: Deliver Stocked Products
Rapid, Dynamic Reconfiguration of Return Process to Meet Demand	The ability to reset and reconfigure the RETURN process capacity, routings, etc. by transmitting new requirements and directives using mathematical models, the Internet, outsourcing and flexible partnership agreements. Also requires integration with the CRM system for real time redirection of customer returns based upon cost and capacity.	sP5.4: Establish and Communicate Return Plans
Real Time Data on Current Status	Dynamic calculation of safety stock based on actual sales.	sER.4: Manage Return Inventory sES.4: Manage Product Inventory sED.4: Manage Finished Goods Inventories
Real Time Feedback from Production, Raw Materials, and Finished Goods Inventory and Test Activities	Allow dynamic re-synchronization of MAKE activities by tying in real time status information to scheduler.	sM1.1: Schedule Production Activities
Real Time Package Tracking	Tracking and tracing	sED.2: Assess Delivery Performance
Real Time Performance Measurement Reporting Systems	Systems to collect production information online generate reports upon request by operators, and track progress against schedule and standards.	sEM.2: Manage Production Performance
Real Time quality control techniques	Electronic collection of quality data and on-line SPC.	sM1.3: Produce and Test sM2.3: Produce and Test sM3.4: Produce and Test
Real Time Return Anticipation	Having real time data on return demand and including it in the plan and forecast. Requires a connection with customers, call centers or CRM system, possibly to the store level with retail returns. The return demand needs to be included in the production plan as soon as possible because upon repair it may be the next piece of serviceable inventory to satisfy demand.	sP5.1: Assess and Aggregate Return Requirements
Real Time Statistical Control Techniques	Electronic collection of defect data and on-line SPC.	sM2.3: Produce and Test sM1.3: Produce and Test sM3.4: Produce and Test

Best Practice	Definition	Process
Real-Time Optimized Shipment Method Selection (Air Parcel, Ground Parcel, LTL, etc.) Based on Customer Service Requirements	Transportation Management System (TMS) Maintenance Management	sED.6: Manage Transportation sER.6: Manage Return Transportation sES.6: Manage Incoming Product
Real-Time Shipment Tracking, (via internet)	Transportation Management System (TMS) Maintenance Management	sES.6: Manage Incoming Product sER.6: Manage Return Transportation sED.6: Manage Transportation
Re-Balancing of Full-Stream Supply/Demand on a Daily Basis, Including Source-Make-Deliver Resources and Requirements from "Customers' Customer to Suppliers' Supplier"	Enterprise-wide planning system customer Relationship Systems	sP1: Plan Supply Chain
Receivers on the Dock Communicate Directly with the Buyer to Efficiently Resolve Any Discrepancies	Buyer's name for every receipt is clearly visible on Receiver.	sDR2.3: Receive MRO Product sDR1.3: Receive Defective Product sDR3.3: Receive Excess Product
Receiving Equipment and Packaging Materials to Transfer Product Are Planned for In Advance and Readily Available When Needed	Include packaging materials in inventory management system and treat as any other inventory to minimize potential of stock-out.	sDR2.4: Transfer MRO Product sDR3.4: Transfer Excess Product sDR1.4: Transfer Defective Product
Reduce Chances of Operator Error	Automatic download of production equipment with batch recipes/part programs	sM2.3: Produce and Test sM1.3: Produce and Test
Reduce In-Process Product (WIP) Handling	Reduction of WIP handling through automation (i.e. AGVs and ASRS) and process improvement (i.e. reduction of handling steps, shorter move paths)	sEM.6: Manage Transportation (WIP)
Reduce Non-Value Added Activities, Including Queue, Move, and Set-Up Times	Use principals of Lean Manufacturing.	sM2.3: Produce and Test sM3.4: Produce and Test sM2.3: Produce and Test sM1.3: Produce and Test
Reduce Non-Value Added Paperwork While Still Measuring Process Metrics	Electronic data collection of completion, quality, lot tractability, scrap, and labor data	sM2.4: Package sM3.4: Produce and Test sM1.4: Package sM1.3: Produce and Test
Reliable Continuous Improvement Process and Methodology.	None identified	sEP.2: Manage Performance of Supply Chain

Best Practice	Definition	Process
Remote (Sales, Customers) Order Entry Capability	None identified	sD2.2: Receive, Configure, Enter and Validate Order sD1.2: Receive, Enter and Validate Order
Removal of Obsolete Capital Assets	Automated Calculation of ABC Velocity Movement	sES.5: Manage Capital Assets
Removal of Obsolete Stock	Automated Calculation of ABC Velocity Movement	sED.5: Manage Deliver Capital Assets
Re-Planning Process Exists in Multi-Levels of the Supply-Chain between Business Enterprises	Business to business Internet capability to share common data.	sEP.10: Align Supply Chain Unit Plan with Financial Plan
Re-Planning Process Links the Supply Chain Operation with the Business Strategy and the Marketing Strategy	None identified	sEP.10: Align Supply Chain Unit Plan with Financial Plan
Responsiveness and Flexibility Are Emphasized By Developing Expertise in Making Business Processes Re-Programmable, Re-Configurable and Continuously Changeable	Integrated process modeling and software reconfiguration tools	sP1: Plan Supply Chain
Return Process Electronically Tracks Transfer from Station to Station	Utilize Bar coding	sDR3.4: Transfer Excess Product sDR1.4: Transfer Defective Product sDR2.4: Transfer MRO Product
Review Batch Records by Exception	Electronic batch records linked to process plans/recipes and exceptions flagged	sM2.6: Release Finished Product to Deliver sM1.6: Release Product to Deliver sM3.7: Release Product to Deliver
Review Product Profitability	ABC and cost modeling.	sP1.2: Identify, Prioritize and Aggregate SC Resources
Review Transfer Cycle Time Trends and Determine If Equipment Capacity is Properly Balanced with Projected Usage	Periodic review of capital asset plan to determine if additional equipment, if needed, can be funded.	sDR1.4: Transfer Defective Product sDR2.4: Transfer MRO Product sDR3.4: Transfer Excess Product
RFID and Other Tagging	POG software/field force	sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Sales and Operations Agree to Limits of Short Term Flexibility	None identified	sP2.1: Identify, Prioritize and Aggregate Product Requirements
Sales and Operations Planning (S&OP)	See detailed description in beginning of this chapter	sP1: Plan Supply Chain

Best Practice	Definition	Process
Scan Displays for Promotion Conformance	None identified	sD4.4: Stock Shelf
Schedule Includes Preventative Maintenance Program	Interface between maintenance management system and scheduling system	sM1.1: Schedule Production Activities sM3.2: Schedule Production Activities sM2.1: Schedule Production Activities
Schedule Minimizes Changeover Costs between Products	Algorithms that manage set up times/ costs, cleaning times, and ideal job sequences (e.g., color sequencing light to dark)	sM2.1: Schedule Production Activities sM1.1: Schedule Production Activities sM3.2: Schedule Production Activities
Schedule Optimizes Use of Shared Resources Such as Tooling and Production Equipment	Scheduling utilizing optimization techniques Required production resources included in routing/process instructions	sM1.1: Schedule Production Activities sM3.2: Schedule Production Activities sM2.1: Schedule Production Activities
Schedule Reflects Current Plant Status (Equipment Availability, Other Jobs and Resource Availability) On Line	Schedule undated by on line reporting and status systems and re-sequence activities	sM3.2: Schedule Production Activities sM1.1: Schedule Production Activities sM2.1: Schedule Production Activities
Segregate In-Bound Carcass Return Cost from Other Transportation Costs	None Identified	sER.6: Manage Return Transportation
Select Carriers by Least Cost per Shipment and Rate Using Actual Rates Prior to Release to Billing	Rules based carrier selection and actual rate database	sD3.7: Select Carriers & Rate Shipments sD3.6: Route Shipments sD1.7: Select Carriers and Rate Shipments sD2.7: Select Carriers and Rate Shipments (
Service Provider Utilizes Web-Based Communicate to Identify New and Discontinued Repair Sites to Customers	Continuously updated authorized repair sites	sER.7: Manage Return Network Configuration
Set Up Electronic or Pre-authorized Returns	None identified	sDR1.1: Authorize Defective Product Return sDR3.1: Authorize Excess Product Return sDR2.1: Authorize MRO Product Return
Shipment Tracking	None identified	sD3.12: Ship Product sD1.12: Ship Product sD3.13: Receive and Verify Product by Customer sD2.13: Receive and Verify Product by Customer sD1.11: Load Vehicle & Generate Shipping Docs sD2.12: Ship Product

Best Practice	Definition	Process
Shipment Tracking and Tracing	Satellite communications, GPS, RFID	sSR3.5: Return Excess Product sSR1.5: Return Defective Product sD2.6: Route Shipments sD1.6: Route Shipments sD3.6: Route Shipments sSR2.5: Return MRO Product
Short Move Paths	Software that allows for input of the distance that particular parts/WIP need to be moved. This software then need to provide a report based on the cubic feet of material times distance moved by part number.	sEM.6: Manage Transportation (WIP)
Single Data Source for Decision Support and Business Rules	A data warehouse/data mart is the source of all planning (master) data, business rules and transaction data. Analyzing tools enable the ongoing maintenance and improvement of the business rules based on actual data.	sEP.3: Manage Plan Data Collection
Single Point of Contact for All Order Inquiries (Including Order Entry)	None identified	sD2.1: Process Inquiry and Quote sD1.1: Process Inquiry and Quote
SKU Rationalization	None identified	sEP.7: Manage Planning Configuration
Sound Project Management Process and Methodology	None identified	sEP.2: Manage Performance of Supply Chain
Specific Changes to the Plan Are Agreed to Cross-Functionally, According to Defined Business Rules	None identified	sP4.4: Establish Delivery Plans
Stage Product or Service Adoption	None identified	sD4.7: Deliver and/or Install
Staging Based on In-store Zones	Items are staged for re-stocking based on zones within the store. This minimizes restocking effort.	sD4.3: Pick Product from Backroom
Standard Inventory Policy to Determine Excess	None Identified	sER.1: Manage Business Rules for Return Processes
Standard Operating Procedures and Methodology	None identified	sED.7: Manage Product Life Cycle sED.5: Manage Deliver Capital Assets
Standards and Measurements Aligned to Maximize Supply Chain Performance	Internal/external benchmarking, industry standards, customer/supplier alignment agreements, visibility of key performance indicators	sEM.2: Manage Production Performance

Best Practice	Definition	Process
Statistical Test Count	See detailed description in beginning of this chapter	sER.4: Manage Return Inventory sEM.4: Manage In-Process Products (WIP) sED.4: Manage Finished Goods Inventories sES.4: Manage Product Inventory
Stocking is Completed in Zones	Each area of the store has its own stocking plan and items are routed specifically to that area.	sD4.4: Stock Shelf
Storage and Configuration Management for Release and Revision Control of Final Documents	Product data management (PDM) or Electronic Data Management (EDM) feature set	sEM.1: Manage Production Rules
Storage Location Zoning	Automated or Optimized Slotting (Storage Location) Systems	sED.5: Manage Deliver Capital Assets
Strategic Safety Stock of Selected Materials, Items, or Subassemblies to Decouple Sourced Product Issuance Cycle Time from Supplier Lead Time	Use of safety stock algorithms to minimize stock levels.	sM1.2: Issue Material sM2.2: Issue Sourced/In-Process Product sM3.3: Issue Sourced/In-Process Product
Strategic Sales and Operations Planning Process in Place and Managed at the Executive Level	None identified	sEP.10: Align Supply Chain Unit Plan with Financial Plan
Substitution	Trained staff or automated systems (Internet) that recommend up-sell, cross-sell, and/or substitution. See Up and cross selling	sD4.5: Fill Shopping Cart
Supplier "Cost of Nonconformance" Data is Collected, Analyzed and Used in Performance Reporting	Software application to automate data collection and reporting	sES.2: Assess Supplier Performance
Supplier and Material Rationalization	Web based access to supplier/source data	sES.3: Maintain Source Data
Supplier Certification Programs Are Used to Reduce (Skip Lot) or Eliminate Receiving Inspection	Skip lot/sampling inspection logic	sS3.4: Receive Product sS2.3: Verify Product sS2.2: Receive Product sS1.3: Verify Product sS3.5: Verify Product sS1.2: Receive Product

Best Practice	Definition	Process
Supplier Certification Programs Can Reduce the Cycle Time for Certifying Existing Suppliers to Provide New Technologies	None identified	sS3.2: Select Final Supplier (S) and Negotiate sES.7: Manage Supplier Network
Supplier certification programs can reduce the cycle time for initial certification of New Suppliers or Certifying Existing Suppliers that Wish to Provide New Technologies		sES.7: Manage Supplier Network
Supplier Delivers Directly to Point of Use	Electronic Tag tracking to Point of Use (POU) destination	sS1.3: Verify Product sS3.5: Verify Product sS2.3: Verify Product sS1.2: Receive Product sS2.2: Receive Product sS2.3: Verify Product
Supplier Delivers Directly to Point of Use - (Dock to Line or End Destination)	Electronic Tag tracking to Point of Use (POU) destination	sS3.4: Receive Product
Supplier Delivery to Production Process at Point of Use	EDI link to supplier's sales order and inventory systems	sM2.2: Issue Sourced/In-Process Product sM1.2: Issue Material sM3.3: Issue Sourced/In-Process Product
Supplier Development Programs Are Used to Get Local Suppliers to Invest in Developing New Technologies	None identified	sS3.1: Identify Sources of Supply
Supplier Managed Inventories with Scheduling Interfacs to External Supplier Systems	VMI agreements allow suppliers to manage (replenish) inventory	sS1.1: Schedule Product Deliveries
Supplier Managed Inventory of Parts	E.D.I. linkage of Inventory Information	sEM.5: Manage Make Equipment and Facilities
Supplier Performance Assessment System	See detailed description in beginning of this chapter	sES.2: Assess Supplier Performance
Supplier Replaces Defective Material at Customer's Facility with Good Product as Required	Electronic Tag tracking to Point of Use (POU) destination	sS2.3: Verify Product sS1.3: Verify Product sS3.5: Verify Product

Best Practice	Definition	Process
Suppliers Share Responsibility for Balancing Supply and Demand through Joint Service Agreements	None identified	sP2.3: Balance Product Resources with Product Requirements
Supply Chain Advance Planning System	Collaboration among Supply Chain partners extends outwards to customers, spanning the supply chain.Planning,Re-planning,Business Rules,Plan Changes	sP1.4: Establish & Communicate Supply-Chain Plans sP1.1: Identify, Prioritize and Aggregate SC Requirements
Supply Chain is Designed to Have Supply Flexibility Equal to Demand Volatility	None identified	sP1: Plan Supply Chain
Supply/Demand Process is Highly Integrated from Customer Data Gathering to Order Receipt, through Production to Supplier Request	Integrated supply chain planning system with interfaces to all supply/demand data sources through public and private digitally enabled supply networks.	sP1: Plan Supply Chain
Systematic Disposition Of Equipment	Rules for deciding appropriate disposition.	sEM.5: Manage Make Equipment and Facilities
Systems Support Accurate On-Line Visibility of Full-Stream Demand Requirements and Priorities	Advance Planning and Scheduling System, Supply Chain Event Management Software	sP1.1: Identify, Prioritize and Aggregate SC Requirements
Systems Support Accurate On-Line Visibility of Full-Stream Demand Requirements and Priorities as Well as Resource Utilization and Availability	Advance Planning and Scheduling System	sP1.4: Establish & Communicate Supply-Chain Plans
The Demand Plan is Updated Frequently to Reflect Actual Consumption or Customer Forecast Information	None identified	sP2.1: Identify, Prioritize and Aggregate Product Requirements
To Address Conditions which Cannot be Adequately Satisfied During the Current Planning Period, Each Functional Area Develops Prioritized Recommendations for the Subsequent Planning Period	None identified	sP4.4: Establish Delivery Plans

Best Practice	Definition	Process
Tools Support Balanced Decision Making (e.g., Trade-Off between Service Level and Inventory Investment)	Supply chain planning optimization system	sP1: Plan Supply Chain
Total Preventative Maintenance Program	Automatically generated TPM repair schedules integrated with MRP systems, electronic equipment repair history, parts listings, part stores inventory & reorder points, automatic store room parts purchases, Shop floor access to electronic data base of equipment line drawings, electrical wiring diagrams, parts listing reference guide and part cost lists.	sES.5: Manage Capital Assets sEM.5: Manage Make Equipment and Facilities
Transportation Modeling and Rate Analysis	None identified	sSR3.4: Schedule Excess Product Shipment sSR2.4: Schedule MRO Shipment sSR1.4: Schedule Defective Product Shipment
Two-Bin Floor Stock Located at Work Center for "B" And "C" Components - Controlled by Operators and Replenished When One Bin is Empty	None identified	sM3.3: Issue Sourced/In-Process Product
Unique Identifier Tag for Each Repairable Asset	Asset management software using bar code, RFI tag, etc.	sER.4: Manage Return Inventory
Unplanned Orders Are Accepted and Scheduled Only When There is No Detrimental Impact on Overall Product Delivery Plan	Digital Linkages using XML standards (RosettaNet, eBXML, OAGI) to automatically query production capacity and ATP and schedule unplanned orders.	sP3.4: Establish Production Plans sP4.1: Identify, Prioritize and Aggregate Delivery Requirements
Up and Cross Selling and/or Substitution	Trained staff or automated systems (Internet) that recommend up-sell, cross-sell, and/or substitution.	sD4.5: Fill Shopping Cart
Up-to-Date Shop Packet/ Specification for Each Unique Production Event/ Demand	Electronic Work Instructions	sM2.4: Package sM1.4: Package
Up-to-Date Shop Packet/ Specifications	Electronic work instructions	sM3.4: Produce and Test sM2.3: Produce and Test sM1.3: Produce and Test sM3.5: Package

Best Practice	Definition	Process
Use an Exchange System Where Customer is Issued a Serviceable Item Upon Submitting an Unserviceable Item	None identified	sDR2.1: Authorize MRO Product Return sDR1.1: Authorize Defective Product Return
Use Demand Planning	Demand Planning Systems to forecast returns, predict yield rates for reusable products or components, determine demand in a resale market, and project a revenue stream.	sP5: Plan Return
Use Historical Based Return Rate Forecasts	None identified	sP5.1: Assess and Aggregate Return Requirements
Use of CAD/CAE Applications to Simulate Design, Cost and Manufacturing Process	None identified	sD3.1: Obtain and Respond to RFP/RFQ
Use of Cross Functional Teams to Execute the Process of Developing Long-Term Capacity and Resource Plans	None identified	sEP.5: Manage Integrated Supply Chain Capital Assets sEP.6: Manage Integrated Supply Chain Transportation
Use of Platform Teams in the New Product Development Process	None identified	sEP.7: Manage Planning Configuration
Use of Speed Racks for Automated Material Handling	None identified	sD1.9: Pick Product sD2.9: Pick Product
Utilize Concurrent Engineering with Suppliers to Allow Them to Provide Engineering and Product Performance Test Data	None identified	sS3.2: Select Final Supplier (S) and Negotiate
Utilize Concurrent Engineering with Suppliers to Allow Them to Provide Engineering and Product Performance Test Data to Qualify as Part of Potential Supplier Network	Internet, EDI, FAX	sES.7: Manage Supplier Network
Utilize EDI and EFT for Payment to Speed Closing of Receivables and to Reduce Processing Costs	EDI transaction and network services	sD3.15: Invoice sD2.15: Invoice sD1.15: Invoice
Utilize EDI Transactions to Reduce Cycle Time and Costs	EDI interface for 830, 850, 856 & 862 transactions	sS1.1: Schedule Product Deliveries sS3.3: Schedule Product Deliveries sS2.1: Schedule Product Deliveries

Best Practice	Definition	Process
Utilize Enterprise Information Systems	Enter, Process, and Deliver information about the manufacturing process to management using information systems that span the enterprise	sEM.3: Manage Make Information
Utilize Internet-Based Freight Bidding Built Around Shared Shipping Volume Projections	None Identified	sER.6: Manage Return Transportation
Utilize Invoice-less Freight Payment	None Identified	sER.6: Manage Return Transportation
Utilize Real-World Cases in Employee Training	None Identified	sER.1: Manage Business Rules for Return Processes
Utilize Web-Based Collaboration between Asset Manager and Repair Sites Regarding Capacity and Scheduling	Total return asset visibility throughout the network	sER.7: Manage Return Network Configuration
Utilize Web-Based Collaboration between Customer and Service Provider on In-Bound Return Forecasts and Asset Tracking	Shared return forecasts	sER.7: Manage Return Network Configuration
Utilize Web-Based Collaboration to Identify Potential New Repair Sites Prior to Their Selection	Shared knowledge of resource availability and bottlenecks	sER.7: Manage Return Network Configuration
Value Pricing Based on "Cost to Serve"; EDLP; Cost Plus Pricing	Activity Based Costing; Integrated Order Management by Customer by Line Item	sD2.2: Receive, Configure, Enter and Validate Order sD1.2: Receive, Enter and Validate Order
Vendor Managed Inventory	See detailed description in beginning of this chapter	sS3.4: Receive Product sD1.5: Build Loads sEM.4: Manage In-Process Products (WIP) sP1: Plan Supply Chain sS2.2: Receive Product sS1.2: Receive Product sP4.1: Identify, Prioritize and Aggregate Delivery Requirements sD3.5: Build Loads sES.7: Manage Supplier Network sM1: Make-to-stock sS2.1: Schedule Product Deliveries sD2.6: Route Shipments sES.4: Manage Product Inventory

Best Practice	Definition	Process
View for Analysis for All Orders and Shipments the Following Data: Logistics, Product, Cost, GL Charging	Transportation Management System (TMS) Maintenance Management	sD.6: Manage Transportation
Wave picking	See detailed description in beginning of this chapter	sD1.9: Pick Product

Best Practice	Description/Definition	Process
Access to supplier environmental data	Access to supplier environmental management and compliance data	sES.3
Aggregate requirements	Aggregate requirements to minimize transportation requirements	sP4.1
Avoid returns beyond economic repair	Estimate damage to product and do not physically return product that is beyond economical repair or offers no diagnostic value	sDR1.1, sDR2.1
Balance environmental requirements	Balance environmental requirements as well as supply/demand requirements	sP1.3, sP3.3
Benchmark practices	Benchmark practices of other firms	sM1.3, sM2.3, sM3.4
Bulk Packaging	Package larger groups of items in a single package (bulk)	sM1.4, sM2.4, sM3.5
Bundle deliveries	Bundle deliveries of different products into single shipment when possible	sS1.1, sS2.1, sS3.3
Collaborate with supply chain partners	Supply chain partners collaborate to improve the environmental performance of the supply chain	sP1.4
Collaborative environmental management processes	Collaborative environmental management processes with suppliers, including EMS integration	sES.1
Communicate environmental requirements	Include environmental requirements in communications.	sP1.4
Consider environmental impacts	Consider environmental impacts when identifying requirements	sP1.1, sP1.2
Consider environmental production constraints	Environmental constraints are considered as part of production capacity	sP3.2
Considerations emissions in transportation decisions	Integrate environmental emissions considerations to transportation decisions. Feature: Implement Environmental Management System	sEP . 6
Consolidate shipments where possible	Consolidate shipments where possible	sDR2.2
Consolidate to minimize energy consumption	Consolidate to minimize fuel/energy consumption	sD1.4, sD2.4, sD3.5
Daily HAZMAT inspection	Daily inspection of any hazardous waste storage areas	sM1.7, sM2.7, sM3.8
Develop environmental performance standards.	Develop environmental performance standards.	sEM.2
Develop supplier partnerships	Develop a partnership with suppliers to help them implement and maintain environmentally sustainable business practices	sES.2
Enable customer direct shipments	Enable direct shipments between customers to reduce overall transportation and handling.	sSR.3, sDR.3

Best Practice	Description/Definition	Process
Energy-efficient buildings	Utilize energy-efficient lighting and heating systems throughout warehouse and production areas	sES.4
Energy-efficient HVAC systems	Utilize energy-efficient HVAC systems	sES.4
Ensure environmental documentation	Ensure all required environmental documentation is obtained	sM1.6
Environmental Management System (EMS)	Implement an Environmental Management System (EMS) to track and manage environmental performance and to track performance against regulatory requirements	sP1, sEP.8
Environmental performance standards.	Develop environmental performance standards.	sEP.1
Establish environmental partnerships	Establish environmental partnerships with suppliers	sS3.2
Establish environmental requirements	Establish supplier environmental requirements	sES.7
Establish spill controls	Establish spill controls for finished goods inventory storage	sD1.3, sD2.3
Factor environmental considerations into planning	Factor environmental considerations/restrictions into capacity planning	sEP.5
Identify and manage environmental impacts	Identify and manage environmental aspects and impacts of supply chain operations to mitigate the impacts	sP1
Identify green products	Identify products that are manufactured to minimize environmental impacts	sP2.2
Identify items to return	Identify MRO items that will need planned maintenance during the planning horizon	sP5.1
Identify recyclable/reusable materials	Identify recyclable/reusable materials	sP2.2
Identify take-back programs	Identify products in take-back programs that are near end of life	sP5.1
Implement pollution prevention program	Implement comprehensive pollution prevention program and include environmentally preferable purchasing.	sM1.3, sM2.3
Implement an EMS	Implement an EMS	sEM.2, sEM.8, sM1.3, sM2.3, sM3.4, sEM.1, sM3.7, sM1.6, sM2.6
Implement HAZMAT "pharmacy" system	Implement hazardous materials "pharmacy" system	sM1.6, sM2.6, sM3.7, sEM.5

Best Practice	Description/Definition	Process
Implement pollution prevention program	Implement rigorous pollution prevention program	sEM.8, sEM.4, sEM.6, sS1.4, sS2.4, sS3.6, sM1.2, sM2.2, sM2.7, sM3.3, sM3.8
Include environmental costs	Include environmental costs in inventory carrying costs	sD1.3, sD2.3
Include environmental requirements	Include environmental requirements in deliver rules	sED.1
Include product's environmental attributes	Include product's environmental attributes information	sEM.3
Include supplier environmental information	Include supplier environmental information in addition to product environmental information	sM1.6
Infrequent product delivery	Minimize need for frequent shipments by accurately determining product needs	sS1.1, sS2.1, sS3.3
Integrate environmental considerations	Integrate environmental considerations into the business rules.	sEP.1
Manage environmental performance	Manage environmental performance of the supply chain.	sEP.2
Manage foreign environmental requirements	Manage foreign environmental requirements	sED 8
Manage hazardous inventory	Manage hazardous inventory	sED.4
Material content classification	Material content classification (HAZMAT recycleable, etc.)	sEP.7
Maximize Container Loading	Re-design container shapes to minimize material used but retain amount of product stored	sM1.4, sM2.4, sM3.5
Maximize loads, minimize runs	Maximize load size; minimize transportation runs	sP4.3, sP4.4
Measure environmental impacts	Measure environmental impacts of the supply chain	sP1
Minimize energy use	Plans are created to minimize energy use	sP3.4
Minimize Make emissions	Plans are established to minimize emissions (e.g., release VOCs after dark)	sP3.4
Minimize packaging	Work with suppliers to minimize packaging requirements and use reusable packaging material	sP2.2, sP4.2
Minimize vehicle fuel use	Plan the use of high-efficiency, low-emissions, or alternative-fuel vehicles where possible	sP4
Monitor product compliance	Review product for compliance with environmental specifications, including product packaging	sS1.3, sS2.3, sS3.5

Best Practice	Description/Definition	Process
Monitor supplier environmental compliance	Determine supplier environmental compliance performance/Actively participate in regulation development	sEP.8
Plan for proper product disposal	Plan for proper product disposal	sED.7
Pollution prevention program	Implement comprehensive pollution prevention program and include environmentally preferable purchasing.	sM3.4
Product “take-back” programs	Select firms that offer product “take-back” programs	sS.3.2
Provide environmental training	Provide environmental training to all employees	sM2.3, sM3.4, sM1.3
Purchase environmentally friendly materials	Purchase environmentally friendly materials	sP2
Purchase previously used supplies	Purchase previously used supplies	sS3.1
Purchase recycled product	Purchase products from recyclers or remanufactures	sS3.1
Reduce Make environmental impacts	Identify processes that reduce environmental impacts of manufacturing	sP3
Retrieve packaging after installation	Retrieve packaging after installation for reuse	sD1.12, sD2.12, sD3.10, sM1.4, sM2.4, sM3.5
Reusable pallets	Utilize reusable pallets	sES.4
Route to minimize fuel consumption	Route to minimize fuel consumption	sD1.6, sD2.6
Schedule air emissions after sunset	Schedule air emission emitting activities after sunset	sM1.1, sM2.1, sM3.2
Schedule high energy consumption at night	Schedule electricity consuming (large amounts) activities from sunset to sunrise	sM1.1, sM2.1, sM3.2
Schedule to maximize transportation capacity	Schedule to maximize transportation capacity	sD3.4
Select carriers using retread tires	Select carriers using retread tires	sD1.7
Select carriers with EMS	Select carriers that have adopted an EMS or otherwise demonstrated environmental commitment	sD1.5, sD1.7, sD2.5, sD2.7, sD3.6
Select carriers with good records	Select carriers with good environmental records	sD1.5
Select complaint carriers	Select carriers that have not violated environmental laws	sD1.7
Select firms with EMS	Select firms that have implemented an EMS	sS3.2
Select ISO 14001 firms	Select firms that are ISO 14001 certified or similar	sS3.2
Select suppliers with EMS	Select suppliers with active EMS systems	sP2, sS1, sS2, sS3

Best Practice	Description/Definition	Process
Spill control	Spill control	sED.4
Storm water management plans	Implement storm water management and spill response plans	sES.4
Stormwater prevention plans	Stormwater prevention and spill control plans for waste accumulation areas	sM1.7
Supplier environmental performance criteria	Develop a set of environmental performance criteria for all suppliers	sES.2
Take-back program	Take-back program at end of product life	sED.7
Track foreign environmental requirements	Maintain and manage current foreign environmental regulations	sES.8
Track supplier environmental records	Processes to identify suppliers with good environmental records	sP2
Use multi-purpose packaging	Use multi-purpose packaging that can be used by customer	sM1.4, sM2.4, sM3.5
Use non-toxic solvents	Use non-toxic solvents for machinery cleaning	sEM.5
Use recyclable packaging	Use recyclable packaging	sM1.4, sM2.4, sM3.5
Use reusable packaging	Use reusable packaging where possible	sP4.2
Utilize alternative fuel vehicles	Utilize alternative fuel vehicles	sS1.4, sS2.4, sS3.6, sM1.2, sM2.2, sM3.3, sEM.6
Utilize energy-star (or similar) equipment	Utilize energy-star (or similar) equipment whenever possible	sEM.5
Utilize green purchasing practices	Utilize green purchasing practices	sS1, sS2, sS3
Utilize high efficiency vehicles	Utilize high fuel efficiency vehicles	sS1.4, sS2.4, sS3.6, sM1.2, sM2.2, sM3.3
Utilize maintenance free batteries	Utilize maintenance free batteries in warehouse/ short haul vehicles	sM2.2, sES.4
Utilize non-toxic materials	Utilize non-toxic solvents and cleaning materials	sEM.5
Utilize non-wood or recycled pallets	Utilize non-wood pallets or recycled pallets	sEM.6
Utilize off-peak shifts	Utilize off-peak shifts for production workers (e.g., shift 1 = 11:00–19:00)	sM1.1, sM1.2, sM3.2
Utilize retread tires	Utilize retread tires	sEM.6
Waste accumulation EMS	EMS covering waste accumulation processes	sM1.7, sM2.7, sM3.8

Supply Chain Risk Management (SCRM)

Supply chain risk management is the systematic identification, assessment and mitigation of potential disruptions in logistics networks with the objective to reduce their negative impact on the logistics network's performance.

A high number of potential disruptions can negatively impact supply chain performance. Potential disruptions can either occur within the supply chain (e.g. insufficient quality, unreliable suppliers, machine break-down, uncertain demand, etc.) and outside (e.g. flooding, terrorism, labor strikes, natural disasters, etc.). Both are considered in an integral three-phase approach for supply chain risk management:

Phase 1 - Risk Identification: What can go wrong? What is uncertain? Based on a description of a supply chain with SCOR, each single process should be looked at with regards to potential disruptions that may negatively harm the performance and which countermeasures are already in place. Result of this phase is a list of the relevant supply chain risks.

Phase 2 - Risk Assessment: How likely is it that a certain potential incident will occur? What is the impact? The likelihood of occurrence and the negative impact on SCOR performance measures of each supply chain risk should be qualitatively or quantitatively evaluated. Result of this phase is a list of serious risks that can be visualized in a risk portfolio with the dimension probability of occurrence and negative impact.

Phase 3 – Risk Mitigation: How can the risks be controlled and monitored? Mitigation measures (e.g. improved planning methods, alternative suppliers, response plans, redundant infrastructure, etc.) should be evaluated for the serious risks. After having checked the cost-efficiency of the alternative measures, the appropriate measures should be chosen and implemented. A risk can be mitigated by decreasing the likelihood that it will occur or by decreasing its impact if it does occur. Alternatives to mitigation include acceptance, transfer, and risk sharing.

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need and Suitability Indicators

Supply chain risk management is suitable especially for supply chains in uncertain environments, with low redundancies in terms of material and capacity buffers as well as high requirements on the supply chain performance. Risk management is particularly applicable to organizations that have a low tolerance for risk in their business strategy.

Risk Management

Additional Comments

Examples for typical supply chain risks are raw material shortage, supplier failures, increased material price, machine break-down, uncertain demand, inaccurate forecasts, change orders and transportation failure. Other risks not directly related to the supply chain are for example product liability risk or strategy risk. Therefore supply chain risks are only a part of all business risks. Hence, supply chain risk management should be integrated in an enterprise risk management.

For the implementation of supply chain risk management in organisations the process and responsibilities have to be clearly defined. The resources, e.g. staff, budget, should be assigned by the top management. The participating staff members need to be motivated and skilled.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	The over-all objective of SCRM is to increase the reliability of the supply chain and decrease the variability of the order fulfillment.
Responsiveness	The variability of the order fulfillment cycle time is reduced and the recovery time from disruptions is shortened.
Flexibility	Due to the proactive proceeding the supply chain is better prepared for sudden changes and thus more flexible.
Costs	The logistics costs are reduced in the long run.
Asset Management	The variability of inventories in the supply chain is reduced.

Key Best Practice Success Factors

Technology Features	Modeling and simulation tools are frequently employed to identify and assess risks as well as mitigation approaches. Advanced planning tools can be employed to rapidly reconfigure the supply chain in response to a disruption. Moreover, software for well-established assessment techniques, e.g. FMEA, FTA, ETA, exists.
Other Success Factors	The risk management process should be carried out cross-functional and - if possible - together with representatives from all companies of the supply chain.

Additional Resources

Brindley, C. (ed.) (2004): Supply Chain Risk – A Reader. Ashgate Publishing Limited.

Handfield, R., Blackhurst, J., Craighead, C.W. (2007): Supply Chain Risk Management: Minimizing Disruptions in Global Sourcing. CRC press.

Modarres, M. (2006): Risk Analysis in Engineering – Techniques, Tools, and Trends. Taylor & Francis.

Sheffi, Y. (2005): The Resilient Enterprise – Overcoming Vulnerability for Competitive Advantage. The MIT Press.

Ziegenbein, A. (2007): Supply Chain Risk – Identification, Assessment and Mitigation. vdf Hochschulverlag Zürich (in German).

(2004) A Guide to Project Management Body of Knowledge. PMBOK guide – Project Management Institute, Inc

(2002). Risk Management Guide for DoD Acquisition – Defense Acquisition University US Department of Defense.

There is a Supply Chain Council Special Interest Group on Risk Management in SCOR model. Please contact the group at info@supply-chain.org, if you would like to contribute to this topic.

Risk Management

Supply Chain Risk Identification

A key aspect of supply chain risk management is identification. Identification involves creating a list of potential events that could harm any aspect of the supply chain's performance. Risk identification allows an organization to take steps to create plans to manage risks before they occur. This is typically more cost effective than waiting to react to adverse events when they occur.

Some methods for identifying risk are:

- Looking at historical problems – Historical problems may have a high chance of recurring. Those problems may have happened to the organization itself or to others.
- Researching industry trends – Other organizations and industry groups may have already researched risks that are applicable.
- Group of experts brainstorming – People with experience in different areas of your organization and supply chain have lots of knowledge of risks. Getting them together increases the knowledge sharing.
- Supply chain mapping – Visual maps of supply chains reveal supply chain structures, dependencies, and handoffs that may contain risk. SCOR mapping and Value Stream Mapping are two types of supply chain mapping that can be used.
- Assessment surveys – Well designed surveys can be an effective way to quickly gather information on risks in your supply chain.
- Site visits – Site visits to supply chain partners allow you to collect detailed and less “filtered” information on risks.
- Information audits – Data system audits can reveal issues and trends from the past. It can show areas of the supply chain that have had poor performance in the past and are thus more likely to perform poorly in the future.
- Delphi method
- Risk checklists
- cause-effect-diagrams and
- critical path method

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

Any organization interested in managing risks must first identify them.

Additional Comments

In the Plan step of SCOR, an organization can create plans for identifying risk on an ongoing basis. Risks can be classified into Source Risks, Make Risks, Deliver Risks, and Return risks.

- Source risk identification – Standardized source assessments and surveys are effective. Some companies have already developed such assessments.
- Make risk identification – Internal risks to an organization that have been extensively studied and include: Sarbanes-Oxley Compliance; fiscal, environmental, and social responsibility; health and labor laws; loss of manufacturing capability (due to labor loss, property loss, ...); quality management; increases in production costs; link to source risks (interruptions and increases in costs); capacity (over and under); intellectual property; and personnel management.
- Deliver risk identification – Visibility of customers improves the ability to identify Deliver risks.
- Return risk identification – Data on returns needs to be tracked to identify risks. Excessive returns may reveal risks earlier in the process.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Identifying risk is the first step towards reducing the potential for risk which increases the reliability of the supply chain.
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Asset Management	None Identified

Key Best Practice Success Factors

Technology Features	Non Identified
Other Success Factors	Non Identified

Additional Resources

(2004) A Guide to Project Management Body of Knowledge. PMBOK guide – Project Management Institute, Inc

(2002). Risk Management Guide for DoD Acquisition – Defense Acquisition University US Department of Defense.

Hoefl, S., Davey M., Newsome, D., (May-June 2007) Proactively Managing Risk: The New Waste. Defense AT&L.

Risk Management

Supply Chain Risk Monitoring

Once areas of risk have been identified, an organization needs to monitor their internal and external environment. This helps them to predict when risky events are becoming more likely. It also helps to identify new risks and is tightly linked to the best practice of Supply Chain Risk Identification.

SCOR's focus on supply chain metrics enables Supply Chain Risk monitoring. Real time metrics and periodic reports give decisions makers knowledge upcoming risks. Statistical analysis of key metrics can reveal trends. Visibility into supplier and customer metrics increases the ability to monitor. Reports on risk monitoring can be combined with existing management reviews and meetings.

Monitoring can also include monitoring qualitative sources of information such as news or weather reports to identify events that are precursors to risks.

In the Plan step, an organization can plan methods for monitoring Source, Make, Deliver, and Return risks. These methods may include specific metrics to monitor and "watch-out" lists of precursor events. It may also include monitoring the environment external to the organization's supply chain.

- Deliver risk monitoring can be done with customer service metrics.
- Make risk monitoring can be done automatically through an organization's data systems such as an ERP system.
- Source risk monitoring is enhanced with visibility into suppliers' metrics.

It is important to monitor indicators that would appear early in a risk event or, better, even before it occurs by indicating an increasing likelihood. If monitoring only reveals a risk well after its first occurrence, it will likely be too late to adequately respond to it.

Monitoring can also be used to test the effectiveness of risk controls. If a plan to mitigate or prevent a risk has been implemented, monitoring can check to see if the corresponding metrics show no signs of the risk occurring.

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

Risk monitoring is used when an organization desires to be proactive in risk mitigation and take actions prior to an actual risk occurrence.

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Monitoring risk will allow the company to be proactive in risk response preventing a disruption from impacting supply chain performance resulting in continuous, reliable delivery.
Responsiveness	None Identified
Flexibility	None Identified
Costs	If risk is discovered early, then is more potential to prevent it or at least minimize the impact of it on costs.
Asset Management	None Identified

Key Best Practice Success Factors

Technology Features	Automated metrics reporting Automated information collection
Other Success Factors	Risk monitoring programs need to have a clear process for escalating information that would indicate a disruption will or has occurred. This process will ensure that monitoring leads to proper actions being taken.

Additional Resources

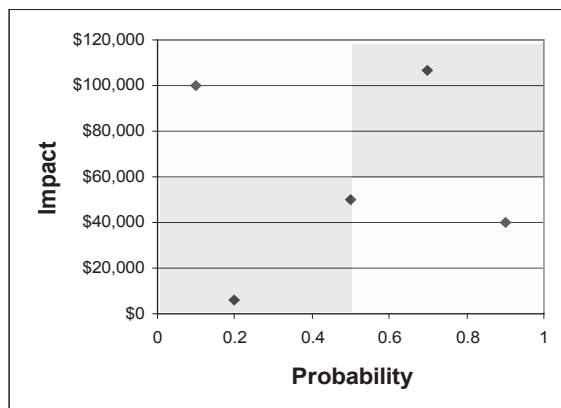
None Identified

Risk Management

Supply Chain Risk Assessment

Supply Chain Risk assessment provides management with an understanding of where the greatest risks may exist in order to prioritize resources for risk mitigation and management. Performing such assessments will involve clarifying the nature of the risk, understanding conditions that may lead to the event, knowing how frequently such events have happened or can be expected to happen, and the potential impact of such events. The team can then prioritize addressing the risks.

- Risk assessment is typically made up of two measures: Likelihood and Impact.
- Likelihood – measures the probability that the event will occur. With formal probability, a likelihood of 0 means the event will never occur and a likelihood of 1 means the event will surely occur. The exact probability may be difficult to determine unless there is historical data that can be used to find the frequency of the event occurring. Alternatively an organization can use a subjective likelihood, or degree of belief, based on the opinions of experts. A time horizon is necessary to define the probability in a useful way (e.g., the likelihood that an event will occur in the next year or the likelihood that the event will occur in the next 50 years).
- Impact – measures the consequences on the organization if the event occurs. It can be measured directly, for example in terms of dollars. It can also be measured on a scale, for example from zero to one with zero being very little negative consequence, 0.5 being a medium amount of consequence, and one being a very bad consequence. Methods for measuring impact include “what-if” simulations, financial models, and opinions of teams of experts. Impact may also be measured in terms of other SCOR metrics besides financials.
- Summary risk score – A summary risk score can be calculated for each risk by multiplying the Impact times the Probability to get an expected value of the risk. Then risks can be ranked by risk score. Also the risks can be shown on a map or graph. An example is shown below.



- Other methods for assessment include:
 - Failure Mode Effects Analysis (FMEA)
 - Fault Tree Analysis (FTA)
 - Event Tree analysis (ETA)

A risk assessment tool in the form of qualitative and quantitative spreadsheet which can be used by management teams to organize the assessment of risks to an organization. The tool can contain also contain information on relevant causes of those risks and their assessment, mitigation options and the impact of various mitigation plans. This helps establish standards for the measurement, reporting, and limiting of risk. The tool can contain risk categories from other known best practices such as COSO.

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

Risk assessment is a tool for quantifying the potential impact of supply chain disruptions and is a key tool for prioritizing mitigation activities. Risk assessment should be used to increase the veracity of a supply chain risk management program and better support resource allocations.

Additional Comments

Risk management is widely discussed, but practitioners have differing views of the categories, significance, and how to integrate mitigation plans into the overall project or operational plan. A frequent issue is that management focuses on the highest impact risks, overlooking more frequent occurrences. This tool should help standardize risk management vocabulary and practices within an organization. Can help embed risk management in the operating and project plan.

A best practice is to have project teams update the assessment/ plan as complete project milestones, such as file permits, FEL3, etc. Keeps risk mitigation plan integrated with overall project, such as by eliminate risk mitigation plans which as no longer pertinent.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Good risk assessments will identify the most significant risks to be mitigated and, therefore, decrease the likelihood of disruptions to reliability. Improves reliability by facilitating risk mitigation plans.
Responsiveness	None Identified
Flexibility	Good risk assessments will identify the most significant risks to be mitigated and, therefore, increase the ability to increase flexibility.
Costs	Good risk assessments will identify the most significant risks to be mitigated and, therefore, best allocate cost resources to mitigate risks. Improves cost control by identifying factors which can costs to exceed forecast, and by facilitating risk mitigation plans.
Asset Management	None Identified

Risk Management

Key Best Practice Success Factors

Technology Features Some more sophisticated methods of risk assessment involve the use of simulations to derive approximations for the impact of risks. A variety of different types of supply chain simulation software are available and may be used for this purpose.

Microsoft Excel software, or equivalent.

Other Success Factors Procedure for use of this Best Practice in the context of the firms vocabulary and policies.

Standard assessment criteria

Training on that procedure for management, risk assessment professionals, and supply chain professionals.

Additional Resources

(2004) A Guide to Project Management Body of Knowledge. PMBOK guide – Project Management Institute, Inc

(2002). Risk Management Guide for DoD Acquisition – Defense Acquisition University US Department of Defense.

Hoefl, S., Davey M., Newsome, D., (May-June 2007) Proactively Managing Risk: The New Waste. Defense AT&L.

Failure Mode and effect analysis.

Enterprise Risk Management —Integrated Framework. Committee of Sponsoring Organizations of the Treadway Commission (COSO)

Sourcing Risk Mitigation Strategies

For most manufacturing operations, over 70% of cost is associated with purchased goods and services. These organizations may identify some goods or services as posing unacceptable supply risk, in case of suppliers business rationalization, excessive demand, fire, work outage, etc This best practice identifies some Risk Mitigation strategies.

Source risk mitigation strategies can include:

- Multiple sources of supply
- Strategic agreements with suppliers
- Supplier partnerships
- CPFR
- Joint product design and delivery
- Etc.

SCOR Process(es)

sEP.9, sES.9

Best Practice Need Indicators

This practice fits well with companies that have a few, significant supplier or a supplier base that is constrained or powerful. It also is useful if the supplier base or the raw materials purchased are inherently high risk.

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	To improve reliability through appropriate mitigation plans
Responsiveness	None Identified
Flexibility	None Identified
Costs	By avoiding various negative outcomes, can avoid costs.
Asset Management	None Identified

Key Best Practice Success Factors

Technology Features	None Identified
Other Success Factors	None Identified

Additional Resources

Various Institute for Supply Management (ISM), other documents.

Risk Management

Crisis Communications Planning

Open communication is necessary for effective risk management, where the term “open” refers to the possibility to directly reach the right person – who can better handle the information about a crisis situations – wherever in the organization (i.e. refer to the Nokia-Ericssons case in Sheffi, 2005).

Managers require direct communication channels up, down and across their business units to help identify risks and take appropriate actions.

The communication should also be fast and reliable: suitable methods of communication (from phone call to e-mail messages or even more advanced means) and redundant communication capabilities should be identified.

Periodic reports shared within the partners of the supply chain can definitively help in coordinating efforts related to risk management activities and initiatives.

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

Open crisis communication is needed when a coordinated response is needed to prevent or respond to supply chain disruptions.

Additional Comments

This practice aims at smoothing the problems due to lack of communication within company's functions or within different companies among the supply chain. Establishing an open, reliable and fast communication channel means allow people to work with the right information in the right place at the right time, in order to ensure coordinated Risk Management activities

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	It improves the reliability by fastening and ensuring communication through the organization and the supply chain so that material flows in a predictable manor.
Responsiveness	It can help in implementing faster response by reduce the lag between events and people awareness
Flexibility	It can help during planning activities providing the most valued information to decision makers within the whole supply chain
Costs	It can reduce the costs by ensuring prompt and proper reaction to disruptive events, thanks to reliable information sharing within the supply chain's partners
Asset Management	None Identified

Key Best Practice Success Factors

Technology Features Using intranet to communicate the organization's efforts and involve all employees in managing risk.
Risk management portal with access for all required partners.

- Other Success Factors
- Holding quarterly meetings of a risk management committee to review and discuss the organization's exposure and protection measures.
 - Promoting awareness of risk management issues through monthly, quarterly and annual reports.
 - Encouraging people to discuss mistakes.

Additional Resources

"Best Practices in Risk Management: Private and Public Sectors Internationally" Treasury Board of Canada Secretariat. Accessed on 10/25/2007 at http://www.tbs-sct.gc.ca/pubs_pol/dcgpubs/RiskManagement/rm-pps1_e.asp

Sheffi, Y. (2005): The Resilient Enterprise – Overcoming Vulnerability for Competitive Advantage. The MIT Press.

Risk Management

Risk Management Programs Coordination with Partners

The process of coordinated risk management places a strong emphasis on cooperation among departments within a single company and among different companies of a supply chain to effectively manage the full range of risks as a whole. A closer coordination of risk management activities performed throughout the supply chain is intended to conserve resources and increase effectiveness.

The adoption of a common process framework within the supply chain can foster the share of information in order to improve existing initiatives and removal duplicated or ineffective activities. Moreover, sharing business continuity programs with supply-side and customer-side partners, can help in identifying overlapping areas or uncovered issues.

Risk Management coordination could be achieved by the establishment of a *Risk Management Coordination Committee*, whose purpose is advises and coordinates the identification and inclusion of risk management treatments within the overall risk management process (see, *Comcover reference*)

This practice is at the basis of the shared risk approach.

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

Coordinated risk management is essential in situations where a significant amount of potential risk lies outside of the subject organization's control, e.g., in other business units, upstream in supplier supply chains, or downstream in customer supply chains. In these cases, risk is best mitigated through close coordination with partners that can directly act on the potential risks.

Additional Comments

One important pre-requisite of coordinated risk management is that supply-side partners should be seen from a collaborative rather than a competitive viewpoint. This in order to share best practices, recovery objectives, strategy information, expectations and mutual aid options.

In order to identify critical suppliers, it is possible to send them surveys regarding their business continuity programs. Recurring meetings (some face-to-face) can lead to decreased availability risk and far-greater levels of business continuity program maturity – for both organizations.

Another important pre-requisite is an appropriate visibility into customer events (i.e. inventory level, sales volume, demand forecasts...). This is intended to allow for early detection of risky situations or conditions.

Impact on Supply Chain Performance Attributes/Metrics	
Attribute	Experienced Impact
Reliability	Coordinated action will reduce the potential for overall supply chain disruption and, therefore, provide a better ability to deliver product reliably.
Responsiveness	Coordination of mitigation and recovery activities can increase the speed of response as well as result in a more coordinated and faster supply chain.
Flexibility	Having coordinated response programs in place will speed general communication and coordination across the supply chain, improving the ability to coordinate reactions to surges or decreases in demand.
Costs	By sharing common activities within the supply chain and removing useless or ineffective process, this practice can contribute to cost reduction
Asset Management	None Identified
Key Best Practice Success Factors	
Technology Features	<ul style="list-style-type: none">- Information sharing and communication systems- Knowledge base management systems
Other Success Factors	Coordinated risk management is most effective when coordination is geared toward shared responses to risk and focused on best meeting customer requirements.
Additional Resources	

"Comcover's Awards for Excellence in Risk Management 2004: National Capital Authority". Australian Government Comcover. Accessed on 10/25/2007 at: http://www.finance.gov.au/COMCOVER/docs/2004_NCA.pdf

Risk Management

Supply chain business rules configured to mitigate risk

This practice involves establishing business rules (e.g., customer priority, supplier priority, production routing, transportation routing, etc.) based on minimizing the risk to the supply chain. Under this practice, business rules are established or configured in response to the corporate risk management plan with a goal of reducing either the likelihood of a disruption occurring or the impact to the supply chain should a disruption occur.

Business rule reconfiguration typically includes an assessment of the impact of each rule change on the overall supply chain before actual implementation.

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

This practice is useful in organizations where the cost of supply chain disruptions is high, either from a profit or brand image perspective. Using a risk mitigation configuration will reduce the potential for a disruption and reduce the recovery time after a disruption occurs.

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Designing rules for risk mitigation will reduce the potential for a supply chain disruption improving the overall reliability of delivery. In addition, business rules can keep redundancy in the supply chain to further ensure reliability.
Responsiveness	Some disruption mitigation approaches (e.g., postponed manufacturing) may improve the responsiveness of the supply chain.
Flexibility	By designing rules for mitigating risk, the supply chain is better constructed to redirect capacity in the event of a node failure. This capability will increase flexibility.
Costs	Designing rules for risk mitigation reduces the costs associated with a disruption by providing existing plans for disruption response.
Asset Management	Designing rules for risk mitigation reduces the costs associated with a disruption by providing existing plans for disruption response.

Key Best Practice Success Factors

Technology Features None Identified

Other Success Factors None Identified

Additional Resources

None Identified

Supply chain information configured to minimize risk

This practice involves managing supply chain information networks to minimize the risk to the supply chain. This includes information sharing with partners as well as internal locations. This helps all parties to be quickly informed of a real or potential disruption and respond quickly and appropriately to minimize the disruption impact.

To be effective, this practice needs to include clear identification of what information each supply chain partner needs in order to reduce the overall risk in the supply chain and agreement on information sharing details:

- Formats
- Frequencies
- Technologies
- Processes

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

This practice is useful in organizations where the cost of supply chain disruptions is high, either from a profit or brand image perspective. Using a risk mitigation configuration will reduce the potential for a disruption and reduce the recovery time after a disruption occurs.

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Sharing risk information across the supply chain will minimize the disruption response time and ensure reliable delivery of products and services.
Responsiveness	Sharing information will minimize disruption response time and speed the delivery of products and services following a disruption.
Flexibility	Having set information sharing processes place will speed the response to demand fluctuations and other disruptions improving the flexibility of the supply chain.
Costs	None Identified
Asset Management	None Identified

Key Best Practice Success Factors

Technology Features Information sharing protocols (e.g., EDI, XML. Etc.)

Other Success Factors None Identified

Additional Resources

None Identified

Risk Management

Supply chain network configured to mitigate risk

This practice relies on a risk evaluation of the supply chain to guide the design of the supply chain network. Node locations, transportation routes, capacity size and location, number of suppliers, number of production locations, etc. are all determined in a fashion that mitigates potential disruptions to the ability to deliver product and service to the end customer.

This practice relies on the information collected through risk identification and risk assessment processes to identify nodes that are at a high risk of disruption due to the location of the node. Location specific risks can include tactical strike risks, natural disaster risks, single point of failure risks, etc.

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

This practice is useful in organizations where the cost of supply chain disruptions is high, either from a profit or brand image perspective. Using a risk mitigation configuration will reduce the potential for a disruption and reduce the recovery time after a disruption occurs.

Additional Comments

This practice generally involves making significant changes to the supply chain. The changes tend to be very difficult and expensive to undo, therefore, great care should be taken in reconfiguring the supply chain network.

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	Designing for risk mitigation will reduce the potential for a supply chain disruption improving the overall reliability of delivery
Responsiveness	Some disruption mitigation approaches (e.g., postponed manufacturing) may improve the responsiveness of the supply chain.
Flexibility	By designing for mitigating risk, the supply chain is better constructed to redirect capacity in the event of a node failure. This capability will increase flexibility.
Costs	Designing for risk mitigation reduces the costs associated with a disruption by locating inventory and other assets outside of high risk geographic areas.
Asset Management	Designing for risk mitigation reduces the costs associated with a disruption by locating assets outside of high risk geographic areas.

Key Best Practice Success Factors

Technology Features A risk enabled supply chain network will often rely on network modeling as well as electronic order routing and EDI links between facilities and partners.

Other Success Factors This practice will be most successful when coupled with other risk management practices such as coordinated programs and visibility of risks.

Additional Resources

None Identified

Risk Management

Sourcing Opportunities Prioritization to Improve Cost & Security of Supply

Many businesses need to improve performance through reliable Sourcing of more cost-effective supplies & services to meet customers' needs and growth opportunities. This Best Practice covers "strategic sourcing" approaches for reducing Total Cost of Ownership, and simultaneously assessing supply risk in case of business rationalization, excessive demand, fire, work outage, etc

SCOR Process(es)

sES.9, sEP.9

Best Practice Need Indicators

For organizations which use goods and services in a variety of uses, making it more difficult to determine which goods and services deserve priority for cost improvements and risk mitigation.

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
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Reliability	To improve reliability through appropriate mitigation plans.
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Responsiveness	None Identified
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Flexibility	None Identified
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Costs	Helps prioritize improvement efforts.
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Asset Management	None Identified
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Key Best Practice Success Factors

Technology Features	Data from ERP system on goods and services and where used. Data from ERP system on revenues associated with specific offerings where above goods and services are used.
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Other Success Factors	Management support.
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Additional Resources

Strategic sourcing references on demand identification, ABC and Risk Analysis, Stakeholders analysis, and demand segregation per the training materials.

Bowtie Risk Management Approach

Bowtie risk management is an approach to managing risk that involves separating management into prevention and recovery actions. Management starts with prevention by first identifying the trigger events that will lead to the risk event occurring. Then you can identify ways to either: prevent or detect the trigger event or disrupt the link between the trigger and the risk event. Management then moves to recovery where you identify and improve the process to recover operations after the risk event occurs.

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

None Identified

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Asset Management	None Identified

Key Best Practice Success Factors

Technology Features	None Identified
Other Success Factors	None Identified

Additional Resources

None Identified

Risk Management

Risk Program Monitoring

Risk Monitoring is the continuous assessment of the effectiveness of a supply chain risk management (SCRM) program. Risk monitoring generally covers three aspects of the program.

- 1.The risk exposure present in the supply chain - can use value at risk (VAR) metric
- 2.The portion of risk actively mitigated - can use VAR for risk with active mitigations divided by total VAR
- 3.The ability to respond and adapt to risk events - can use time to recover (TTR) metric

SCOR Process(es)

sEP.9

Best Practice Need Indicators

None Identified

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
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Reliability	None Identified
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Responsiveness	None Identified
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Flexibility	None Identified
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Costs	None Identified
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Asset Management	None Identified
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Key Best Practice Success Factors

Technology Features	None Identified
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Other Success Factors	None Identified
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Additional Resources

None Identified

Network Prioritization for Risk Identification

Network prioritization for risk identification is the process of prioritizing parts of your supply chain for risk analysis based on the overall risk potential in each portion of the supply chain. Prioritization is typically based on the criticality of the component or product flowing through a portion of the supply chain to your business and the number of sources for the material flowing through that portion of the supply chain

SCOR Process(es)

sEP.9, sES.9, sEM.9, sED.9, sER.9

Best Practice Need Indicators

None Identified

Additional Comments

None Identified

Impact on Supply Chain Performance Attributes/Metrics

Attribute	Experienced Impact
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Asset Management	None Identified

Key Best Practice Success Factors

Technology Features	None Identified
Other Success Factors	None Identified

Additional Resources

None Identified

Section 5

People

Introduction to People Skills

The People section of SCOR introduces standards for managing talent in the supply chain. This skills management framework within SCOR compliments process reference, metrics reference, and practice reference components with an integrated view of supply chain skills in four areas:

Baseline skills necessary for the overall process area (e.g., Sourcing, or Planning) and for the individual process.

- Critical skills that differentiate leaders in a particular process area from those who only perform at a baseline level.
- Performance measures through SCOR metrics that relate to continuous assessment of job performance in each process area.
- Credentialing of supply chain skills, including training or certification programs, related to the specific process area that tend to indicate superior job performance.

The key elements of the People section are Skills, Experiences, Aptitudes and Trainings.

Skill

Skill is the capacity to deliver pre-determined results with minimal input of time and energy. Skills are further defined by Experiences, Aptitudes, Trainings and Competency levels. Examples of supply chain skills include: Master Scheduling, Import/Export Regulations, Production Planning, and Risk Mitigation.

Experience

Experience is the knowledge or ability acquired by observation or active participation. Experience is obtained by doing the work in a real life environment and undergoing different situations that require different actions. Example experiences include: Cycle Counting, Cross Docking, and Hazardous Materials Handling.

Aptitude

Aptitude is a natural, acquired, learned or developed ability to perform a certain kind of work at a certain level. Example aptitudes include: Accuracy, Analytical, and Natural leadership.

Training

Training develops a skill or type of behavior through instruction. Examples of trainings are SCOR-S certification, APICS CPIM certification but also include on-the-job training (after the on-the-job training the individual starts to gain experience).

Competency

Competency Level describes the level or state of qualification to perform a certain role or tasks. SCOR recognizes 5 commonly accepted competency levels:

- **Novice:** Untrained beginner, no experience, requires and follows detailed documentation

People

to be able to perform the work.

- **Beginner:** Performs the work, with limited situational perception.
- **Competent:** Understands the work and can determine priorities to reach goals.
- **Proficient:** Oversees all aspects of the work and can prioritize based on situational aspects.
- **Expert:** Intuitive understanding. Experts can apply experience patterns to new situations.

Each skill is linked to Experiences, Aptitudes and Trainings in SCOR. Competency level is to Skill what Maturity Level is to Process. SCOR does not list or suggest competency levels.

People Skills Index

Capacity to deliver pre-determined results with the minimum input of time and energy. Skills are further defined by experience, aptitudes and training.

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- HS.0024 Cost/Price Analysis
- HS.0025 Creating and Management of Business Rules/Company Policies
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- HS.0029 Customer Relationship Management (CRM)
- HS.0031 Customer Repair and Return Policy and Process
- HS.0032 Customer/Supplier Communication
- HS.0033 Data management
- HS.0034 Defective/Missing Product/Discrepancy Reporting and Resolution
- HS.0035 Delivery Balancing
- HS.0036 Delivery Scheduling
- HS.0037 Demand Management
- HS.0038 Design/Engineering Schedule Development
- HS.0039 Driving certification (according to mode of transportation)
- HS.0041 EHS regulations
- HS.0042 Enabling Technology
- HS.0043 Engineering

HS

- HS.0044 Enterprise Business Process
- HS.0045 Environmental Requirements
- HS.0046 ERP Systems
- HS.0048 Forecasting
- HS.0049 ID & Damage Inspection
- HS.0050 Import/Export Regulations
- HS.0051 Installation Requirements
- HS.0052 Installation Scheduling
- HS.0053 Installed base management
- HS.0054 Intellectual Property/Proprietary Data
- HS.0055 International Trade
- HS.0056 Interpreting Specifications
- HS.0058 Inventory Management
- HS.0060 Issue Proposal/Quote
- HS.0061 Item Master/BOM/BoL Interpretation
- HS.0062 Kitting/Packing
- HS.0063 Labor Costs Verification
- HS.0064 Lead-time validation
- HS.0065 Lean Manufacturing
- HS.0066 Legislation and Standards
- HS.0067 Linear programming
- HS.0068 Load Building
- HS.0069 Logistics Management
- HS.0070 Logistics network modeling
- HS.0071 Logistics/Freight
- HS.0072 Performance Management
- HS.0073 Manufacturing Resource Commitment
- HS.0074 Master Scheduling
- HS.0075 Material handling equipment usage
- HS.0076 Milestone/Performance Payments
- HS.0077 MPS Methodologies and Techniques
- HS.0078 MRO Management
- HS.0079 MRP Systems
- HS.0080 MSDS/CoC/BoL/Environmental Interpretation
- HS.0081 Office automation tools
- HS.0082 Optimization
- HS.0083 Order Management
- HS.0085 Outsourcing
- HS.0086 Packaging
- HS.0087 Payment Processing
- HS.0088 Physical Capability
- HS.0089 Physical Distribution Systems
- HS.0090 Picking process / order batching
- HS.0091 Planogram usage and strategies
- HS.0092 Pricing Management
- HS.0093 Prioritization

HS.0094 Procurement
HS.0095 Product and Configuration Validation
HS.0096 Product checkout process
HS.0097 Product Development (PDR, CDR)
HS.0098 Product Information Management (Product Data Management)
HS.0099 Production
HS.0101 Production Planning
HS.0102 Production Planning Capacity Utilization
HS.0103 Production Scheduling
HS.0104 Progress & performance reporting
HS.0105 Project Management
HS.0106 Property Control and Disposition
HS.0107 Push Systems
HS.0108 Quality Management
HS.0110 Receiving
HS.0111 Regulatory Policy Management
HS.0112 Requirements acceptance criteria
HS.0113 Requirements allocation
HS.0114 Requirements change control & change notification
HS.0115 Requirements criteria, verification methods & tools
HS.0116 Requirements defect notification
HS.0117 Requirements justification / rationale
HS.0118 Requirements syntax, attributes, & baselines
HS.0119 Return Management
HS.0120 Return Plan Aggregation
HS.0121 Returns strategy development
HS.0122 Reverse Logistics
HS.0123 RFP/RFQ Management
HS.0124 Risk and exception management
HS.0125 Risk Assessment
HS.0126 Risk Identification
HS.0127 Risk Mitigation
HS.0128 Risk Response Planning
HS.0129 Route planning
HS.0130 S & OP Plan Communication
HS.0131 Safety stock/replenishment calculations
HS.0132 Sales and Operations Planning (S&OP)
HS.0133 Six Sigma
HS.0134 Solicitation Methods
HS.0135 Solicitation/Competitive Bidding Process
HS.0136 Specific fabrication knowledge based on product
HS.0137 Strategic Planning
HS.0138 Subcontracting Types (FFP, CP, CPAF, Performance Based)
HS.0139 Supplier Relationship Management (SRM)
HS.0140 Supply Chain Leadership
HS.0141 Supply Chain Management

HS

- HS.0142 Supply Chain Performance Measurements
- HS.0143 Supply Chain Planning
- HS.0144 Supply Chain Security
- HS.0145 Supply Planning
- HS.0147 Technical Evaluation
- HS.0148 Technical Manual Reading
- HS.0149 Test Stand Operations
- HS.0150 Total Quality Management (TQM)
- HS.0151 Transport Mode Selection
- HS.0152 Troubleshooting
- HS.0154 Vendor Managed Inventory
- HS.0155 Verification Strategies
- HS.0156 VMI planning and management
- HS.0157 Warranty process and policy
- HS.0158 Warranty Return and Repair
- HS.0160 Waste Management
- HS.0161 Wave/batch picking

3-way Receiving Match

Knowledge of the process of reconciling invoices with purchase orders and goods received notes in order to authorise payment of invoices

Aptitudes

HA.0014 Computer Literate

Experiences

HE.0009 Bar Coding/RFID
HE.0078 Electronic Data Interchange (EDI) Systems
HE.0083 Enterprise Resource Planning (ERP)
HE.0100 Financial Accounting
HE.0160 Material Resource Planning (MRP)

Trainings

HT.0006 APICS CPIM 10.0
HT.0012 Basic legal process (embargo, black list) 10.0
HT.0014 Basic Supply Chain Finance 10.0
HT.0016 Business Ethics/Conduct training 10.0
HT.0035 Credit Management 10.0
HT.0052 ERP Systems Training 10.0
HT.0055 Exception Management 10.0
HT.0082 Language skills 10.0
HT.0109 Product Specific Training 10.0
HT.0145 Supply Chain Security

Processes

sS1.2 Receive Product
sS2.1 Schedule Product Deliveries
sS2.2 Receive Product
sS2.5 Authorize Supplier Payment
sS3.4 Receive Product
sS3.7 Authorize Supplier Payment

Acceptance testing

Working knowledge of Functional and/or Quality Assurance testing of product to ensure it will perform in accordance with its intended contractual agreement for form, fit and function. Acceptance testing may in some instances be performed at the supplier's facility and/or at the customer's final delivery location. Successful product acceptance testing may be a prerequisite for supplier payment.

Aptitudes

HA.0042 Methodic
HA.0054 Problem Solving
HA.0067 Thinking & Problem Solving

Experiences

HE.0183 Performance Reporting Systems Development/Use
HE.0208 Quality Management Systems
HE.0276 Technical Interface

Trainings

HT.0006 APICS CPIM
HT.0016 Business Ethics/Conduct training
HT.0052 ERP Systems Training
HT.0082 Language skills
HT.0102 Negotiation Skills
HT.0109 Product Specific Training
HT.0123 Safety and Environmental Management (industry specific, company specific and country specific)

Processes

sS1.3 Verify Product
sS2.3 Verify Product
sS2.5 Authorize Supplier Payment
sS3.5 Verify Product
sS3.7 Authorize Supplier Payment

Accounting

The process of collecting, analyzing, and communicating financial information about a business entity to specified stakeholders.

Aptitudes

HA.0014 Computer Literate
HA.0057 Reliable

Experiences

HE.0002 Accounting
HE.0003 Accounts Receivable
HE.0130 International Financial Reporting Standards
HE.0232 Sarbanes Oxley

Trainings

HT.0006 APICS CPIM
HT.0012 Basic legal process (embargo, black list)
HT.0013 Basic Science
HT.0014 Basic Supply Chain Finance
HT.0016 Business Ethics/Conduct training
HT.0052 ERP Systems Training
HT.0082 Language skills
HT.0102 Negotiation Skills
HT.0109 Product Specific Training

Processes

sD1.15 Invoice
sD2.15 Invoice
sD3.15 Invoice

Advertising Methodologies

Knowledge of effective procurement or business development communication techniques to inform and/or solicit potential suppliers regarding product or service specifications.

Aptitudes

None Identified

Experiences

HE.0011 Basic Procurement

HE.0156 Market Knowledge

Trainings

HT.0055 Exception Management

HT.0102 Negotiation Skills

HT.0145 Supply Chain Security

Processes

sS3.1 Identify Sources of Supply

sS3.2 Select Final Supplier and Negotiate

Assembly Process Design

The arrangement of workers, machines, and equipment in which the product being assembled passes consecutively from operation to operation until completed.

Aptitudes

None Identified

Experiences

HE.0154 Manufacturing engineering
HE.0155 Manufacturing Management

Trainings

None Identified

Processes

sEM.1 Manage Production Rules
sEM.7 Manage Production Network

Asset Management

The process (which requires the use of spreadsheets or software) to identify, collect, maintain and track the companies assets.

Aptitudes

HA.0001 Accountable
HA.0007 Business Knowledge & Acumen (Company specific)
HA.0010 Change Management
HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
HA.0028 Enabling Technology
HA.0038 Initiative
HA.0056 Process Orientation, Systemic and Conceptual Thinking
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0002 Accounting
HE.0010 Basic Finance
HE.0046 Cost/Benefit Analysis
HE.0205 Project Management
HE.0298 Utilizing Finance Systems
HE.0311 Written/Verbal Communication

Trainings

None Identified

Processes

sEP.5 Manage Integrated Supply Chain Capital Assets
sES.5 Manage Capital Assets
sM1.6 Release Product to Deliver
sEM.5 Manage Make Equipment and Facilities
sED.5 Manage Deliver Capital Assets
sER.5 Manage Return Capital Assets

Availability Management

The process of managing and allocating available resources and inventory (at various levels) based on business rules. This would include date, lead time, capacity and inventory management skills.

Aptitudes

HA.0008 Business minded
 HA.0014 Computer Literate
 HA.0019 Customer Oriented
 HA.0026 Diversity Recognition/Respect
 HA.0072 Written/Verbal Communication

Experiences

HE.0008 ATP logic/calculation
 HE.0061 Customer Stocking Agreements Management
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0131 Inventory Management
 HE.0140 Knowledge of business rules concerning customer
 HE.0171 On time-shipping and delivery metric logic/calculation
 HE.0204 Production Planning/Scheduling
 HE.0305 Warehouse/Distribution Management

Trainings

HT.0051 Equipment & Machine usage certification (trucks & lifting equipment)
 HT.0069 Import/Export Regulations
 HT.0084 Lean Manufacturing Training
 HT.0109 Product Specific Training
 HT.0123 Safety and Environmental Management (industry specific, company specific and country specific)
 HT.0145 Supply Chain Security
 HT.0155 Warehouse Management

Processes

sD1.1 Process Inquiry and Quote
 sD1.3 Reserve Inventory and Determine Delivery Date
 sD1.4 Consolidate Orders
 sD2.1 Process Inquiry and Quote
 sD2.3 Reserve Inventory and Determine Delivery Date
 sD2.4 Consolidate Orders

Bar Code Handling/RFID (if available)

Basic working knowledge of the concept of applying or incorporating onto/into a product an optical machine-readable representation of data (bar code) and /or using radio waves with radio-frequency identification tags (RFID) for the purpose of the identification and tracking of that product.

Aptitudes

HA.0004 Analytical
HA.0014 Computer Literate

Experiences

HE.0009 Bar Coding/RFID
HE.0083 Enterprise Resource Planning (ERP)
HE.0094 Exception management tool usage/experience
HE.0115 Identification methodologies
HE.0159 Master Data/Document Management
HE.0197 Product Identification System
HE.0208 Quality Management Systems
HE.0212 Receiving and Verifying Product
HE.0293 Transportation/Warehouse Management systems (TMS/WMS)

Trainings

HT.0006 APICS CPIM
HT.0012 Basic legal process (embargo, black list)
HT.0013 Basic Science
HT.0014 Basic Supply Chain Finance
HT.0016 Business Ethics/Conduct training
HT.0035 Credit Management
HT.0052 ERP Systems Training
HT.0068 IFRS/US GAAP revenue recognition
HT.0082 Language skills
HT.0096 Microsoft Project
HT.0102 Negotiation Skills
HT.0109 Product Specific Training
HT.0112 Project Management
HT.0123 Safety and Environmental Management (industry specific, company specific and country specific)
HT.0145 Supply Chain Security

Processes

sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
sP4.2 Identify, Assess and Aggregate Delivery Resources
sP4.4 Establish Delivery Plans
sP5.1 Assess and Aggregate Return Requirements
sS1.2 Receive Product
sS1.3 Verify Product
sS1.4 Transfer Product
sS2.2 Receive Product
sS2.4 Transfer Product
sS3.4 Receive Product
sS3.5 Verify Product
sS3.6 Transfer 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

Basic Finance

Working knowledge and ability to effectively interpret and communicate general financial accounting practices and principles which maintain company and regulatory compliance.

Aptitudes

HA.0004 Analytical
HA.0046 Numeracy

Experiences

HE.0004 Advanced Financial Accounting Principles
HE.0010 Basic Finance
HE.0047 Cost/Price Analysis
HE.0101 Financial Collaboration
HE.0102 Financial Planning
HE.0230 Sales and Operations Planning (S&OP)
HE.0298 Utilizing Finance Systems

Trainings

HT.0012 Basic legal process (embargo, black list)
HT.0014 Basic Supply Chain Finance
HT.0016 Business Ethics/Conduct training
HT.0035 Credit Management
HT.0055 Exception Management
HT.0102 Negotiation Skills
HT.0109 Product Specific Training

Processes

sP2.3 Balance Product Resources with Product Requirements
sEP.10 Align Supply Chain Unit Plan with Financial Plan
sS3.1 Identify Sources of Supply
sS3.2 Select Final Supplier and Negotiate
sS3.3 Schedule Product Deliveries

Basic Transportation Management

The management of transportation operations of all types, including tracking and managing every aspect of vehicle maintenance, fuel costing, routing and mapping, warehousing, communications, EDI implementations, traveler and cargo handling, carrier selection and management, accounting.

Aptitudes

HA.0001 Accountable
 HA.0004 Analytical
 HA.0007 Business Knowledge & Acumen (Company specific)
 HA.0010 Change Management
 HA.0014 Computer Literate
 HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
 HA.0028 Enabling Technology
 HA.0030 Facilitation ability
 HA.0038 Initiative
 HA.0039 Leadership
 HA.0045 Negotiator
 HA.0052 Presenter
 HA.0055 Process Improvement
 HA.0056 Process Orientation, Systemic and Conceptual Thinking
 HA.0065 Teamwork & Collaboration
 HA.0072 Written/Verbal Communication

Experiences

HE.0023 Carrier selection & qualification
 HE.0046 Cost/Benefit Analysis
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0116 Import/Export Logistics
 HE.0159 Master Data/Document Management
 HE.0162 Materials portfolio and specifications
 HE.0205 Project Management
 HE.0209 Quality processes related to inventory management (test times, shelf life)
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0236 Selecting & Scheduling Modes of Transportation
 HE.0247 Spreadsheet Management
 HE.0265 Supplier Service Strategy Agreements
 HE.0281 Transport Outsourcing
 HE.0286 Transportation planning
 HE.0299 Utilizing Transportation Management Systems

Trainings

- HT.0006 APICS CPIM
- HT.0014 Basic Supply Chain Finance
- HT.0016 Business Ethics/Conduct training
- HT.0025 Communicating Customer & Supplier Information
- HT.0052 ERP Systems Training
- HT.0055 Exception Management
- HT.0069 Import/Export Regulations
- HT.0073 Introduction to Supply Chain
- HT.0082 Language skills
- HT.0090 Logistics Operations
- HT.0102 Negotiation Skills
- HT.0109 Product Specific Training
- HT.0123 Safety and Environmental Management (industry specific, company specific and country specific)
- HT.0126 SCOR
- HT.0145 Supply Chain Security
- HT.0152 Transportation planning
- HT.0155 Warehouse Management

Processes

- 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
- sEP.6 Manage Integrated Supply Chain Transportation
- sES.6 Manage Incoming Product 0
- sEM.6 Manage Transportation (WIP)
- sED.1 Manage Deliver Business Rules
- sED.6 Manage Transportation
- sER.6 Manage Return Transportation

Benchmarking

Working knowledge of the process of capturing and comparing one's own business processes and performance metrics to industry peers and/or best practices from other industries. Typical measures include quality, time, and cost, with the goal of closing performance gaps and doing things better, faster, and cheaper.

Aptitudes

None Identified

Experiences

HE.0185 Performance Reporting System/ERP System

HE.0244 Six Sigma

Trainings

HT.0112 Project Management

Processes

sS1.1 Schedule Product Deliveries

sS2.1 Schedule Product Deliveries

sS3.2 Select Final Supplier and Negotiate

sS3.3 Schedule Product Deliveries

Blanket purchase order process

Working knowledge of the procurement process for soliciting, issuing and administering “open-ended” (period for performance) type purchase orders or contracts which combine and group numerous line items of (generally) like products onto a purchase order or contract.

Aptitudes

None Identified

Experiences

HE.0167 Negotiation

Trainings

None Identified

Processes

sS2.2 Receive Product

Build Schedule Evaluation

Analyzing a product installation schedule against the constraints and requirements in order to ensure feasibility to effectively and efficiently complete the installation process.

Aptitudes

None Identified

Experiences

HE.0008 ATP logic/calculation

HE.0083 Enterprise Resource Planning (ERP)

HE.0204 Production Planning/Scheduling

Trainings

HT.0068 IFRS/US GAAP revenue recognition

Processes

sD3.4 Schedule Installation

HS.0015

CAD/CAM

The process to use computer technology to aid in the design, analysis, and manufacture of products.

Aptitudes

None Identified

Experiences

HE.0012 Bills of Material/Specs/Fabrication Methodology

Trainings

None Identified

Processes

sM3.1 Finalize Production Engineering

Capacity Planning/Management

The process of determining and managing the production capacity needed by an organization to meet changing demands for its products.

Aptitudes

HA.0001 Accountable
 HA.0004 Analytical
 HA.0014 Computer Literate
 HA.0030 Facilitation ability
 HA.0039 Leadership

Experiences

HE.0018 Capacity planning
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0104 Forecasting
 HE.0133 Inventory Valuation/Financial Analysis
 HE.0159 Master Data/Document Management
 HE.0163 Modeling Techniques
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0236 Selecting & Scheduling Modes of Transportation
 HE.0247 Spreadsheet Management
 HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times
 HE.0293 Transportation/Warehouse Management systems (TMS/WMS)

Trainings

HT.0006 APICS CPIM
 HT.0012 Basic legal process (embargo, black list)
 HT.0014 Basic Supply Chain Finance
 HT.0021 Capacity Management (Aggregate Planning)
 HT.0023 Cellular Manufacturing
 HT.0035 Credit Management
 HT.0149 Techniques of Detailed Capacity Planning Process

Processes

sP5.2 Identify, Assess and Aggregate Return Resources
 sEP.1 Manage Business Rules for Plan Process
 sEP5 Manage Integrated Supply Chain Capital Assets
 sEP.7 Manage Planning Configuration
 sEP.10 Align Supply Chain Unit Plan with Financial Plan
 sES.4 Manage Product Inventory
 sES.7 Manage Supplier Network
 sEM.4 Manage In-Process Products (WIP)
 sEM.6 Manage Transportation (WIP)
 sEM.7 Manage Production Network
 sED.4 Manage Finished Goods Inventory
 sED.7 Manage Product Life Cycle
 sER.7 Manage Return Network Configuration

Carrier Selection

Selection of a transportation mode and service provider in order to meet due dates, cost and service objectives

Aptitudes

HA.0026 Diversity Recognition/Respect
HA.0072 Written/Verbal Communication

Experiences

HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0180 Packaging Configuration and Palletizing
HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings

HT.0006 APICS CPIM
HT.0052 ERP Systems Training
HT.0130 Shop Floor-system specific

Processes

sD1.5 Build Loads
sD2.5 Build Loads
sD3.5 Build Loads

Change Notice Development

Working knowledge of the procurement process and the ability to clearly disseminate specific contractual or technical requirements which have changed to Sourced contractors, suppliers or vendors.

Aptitudes

HA.0011 Collaborative

Experiences

HE.0005 Advanced Procurement 10.0

HE.0011 Basic Procurement

Trainings

HT.0069 Import/Export Regulations

Processes

sS1.5 Authorize Supplier Payment

sS3.3 Schedule Product Deliveries

Competitive Bidding

Working knowledge of procurement process for requesting and receiving bids/quotes from competing contractors, suppliers, or vendors based on product part numbers, scope, specifications, terms and conditions and in some cases, the criteria by which the bids will be evaluated.

Aptitudes

None Identified

Experiences

HE.0005 Advanced Procurement 10.0

Trainings

None Identified

Processes

sS2.2 Receive Product

Consignment Agreement Development

Working knowledge of Consignment Agreements which are when one party provides goods/services to another party for sale by that other party. The initial party only gets paid when the other party completes the sale of the goods/services.

Aptitudes

None Identified

Experiences

HE.0035 Consignment practices

Trainings

None Identified

Processes

sS2.1 Schedule Product Deliveries

sS3.3 Schedule Product Deliveries

Contract Management

Experience in solicitation process, bid/proposal evaluation, contract award and post award administration, and closeout. Such knowledge for setting up such agreements is required throughout the Source functions.

Aptitudes

- HA.0001 Accountable
- HA.0002 Accurate
- HA.0007 Business Knowledge & Acumen (Company specific)
- HA.0008 Business minded
- HA.0014 Computer Literate
- HA.0015 Conflict Resolution Skills
- HA.0019 Customer Oriented
- HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
- HA.0026 Diversity Recognition/Respect
- HA.0028 Enabling Technology
- HA.0038 Initiative
- HA.0046 Numeracy
- HA.0056 Process Orientation, Systemic and Conceptual Thinking
- HA.0059 Rules Driven
- HA.0065 Teamwork & Collaboration
- HA.0070 Validation
- HA.0072 Written/Verbal Communication

Experiences

- HE.0005 Advanced Procurement
- HE.0008 ATP logic/calculation
- HE.0010 Basic Finance
- HE.0011 Basic Procurement
- HE.0014 Business model and sales channel
- HE.0028 Collaborative Planning, Forecasting and Replenishment (CPFR)
- HE.0030 Company Pricing/Margin Policy
- HE.0031 Company terms and conditions
- HE.0033 Configuration Management
- HE.0041 Contractual Terms & Conditions
- HE.0081 Engineering/Design Management
- HE.0083 Enterprise Resource Planning (ERP)
- HE.0093 Establishing Technical/Contracts Team
- HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
- HE.0146 Legal Impact
- HE.0153 Managing and Measuring Performance
- HE.0167 Negotiation
- HE.0177 Order-to-cash process
- HE.0188 PLM/PDM knowledge
- HE.0205 Project Management
- HE.0208 Quality Management Systems

Trainings

HT.0028 Contract Management
HT.0030 Contracting for Supply Professionals
HT.0038 CTL
HT.0051 Equipment & Machine usage certification (trucks & lifting equipment)
HT.0114 Quality Management Systems
HT.0123 Safety and Environmental Management (industry specific, company specific and country specific)
HT.0145 Supply Chain Security

Processes

sS1.5 Authorize Supplier Payment
sS2.1 Schedule Product Deliveries
sS2.5 Authorize Supplier Payment
sS3.1 Identify Sources of Supply
sS3.2 Select Final Supplier and Negotiate
sS3.3 Schedule Product Deliveries
sS3.7 Authorize Supplier Payment
sES.10 Manage Supplier Agreements
sD3.2 Negotiate and Receive Contract

Controls and Compliance

Awareness of relevant regulations, laws and requirements, whether external or internal, and the ability to devise, implement and document the relevant and necessary controls in order to maintain compliance and successfully pass auditing requirements.

Aptitudes

HA.0013 Compliance Orientation

Experiences

HE.0011 Basic Procurement

Trainings

None Identified

Processes

sS3.2 Select Final Supplier and Negotiate

sS3.3 Schedule Product Deliveries

Cost/Price Analysis

Basic financial understanding of analyzing the costs/prices associated with a bid/proposal/quotation for a sourced product for the purpose of attaining best cost/price and/or best value for that product. Also used to determine general understanding of the requirements by the supplier(s) and price reasonableness.

Aptitudes

None Identified

Experiences

HE.0010 Basic Finance

HE.0042 Cost Analysis

Trainings

HT.0069 Import/Export Regulations

HT.0155 Warehouse Management

Processes

sS1.5 Authorize Supplier Payment

sS3.3 Schedule Product Deliveries

Creating and Management of Business Rules/Company Policies

A documented set of basic principles and associated guidelines, formulated and enforced by the governing body or an assigned committee of an organization that direct and limit a company's decisions and actions in pursuit of its objectives.

Aptitudes

HA.0001 Accountable
HA.0007 Business Knowledge & Acumen (Company specific)
HA.0009 Business Performance Management
HA.0013 Compliance Orientation
HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
HA.0028 Enabling Technology
HA.0038 Initiative
HA.0056 Process Orientation, Systemic and Conceptual Thinking
HA.0058 Results & Quality Orientation
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0050 Creating/Reviewing/Updating Company Policies
HE.0079 Enforcing Company Policies
HE.0123 Industry Specific Regulatory Knowledge
HE.0205 Project Management
HE.0216 Regulatory Policies/Compliance
HE.0268 Supply Chain Management

Trainings

None Identified

Processes

sEP.1 Manage Business Rules for Plan Process
sEP.8 Manage Plan Regulatory Requirements and Compliance
sES.1 Manage Sourcing Business Rules
sES.8 Manage Import/Export Requirements
sEM.1 Manage Production Rules
sEM.8 Manage Make Regulatory Environment
sED.8 Manage Import/Export Requirements
sER.1 Manage Business Rules for Return Processes
sER.8 Manage Return Regulatory Requirements and Compliance

Credit/Collection Management

Set of activities to assess and rate the credit risk of a customer (ability to meet their financial obligations), identify/block non-creditworthy customers, manage outstanding balances, process credits, and investigate/pursue overdues.

Aptitudes

HA.0002 Accurate
 HA.0014 Computer Literate
 HA.0019 Customer Oriented
 HA.0057 Reliable
 HA.0072 Written/Verbal Communication

Experiences

HE.0003 Accounts Receivable
 HE.0024 Cash Application
 HE.0029 Collections
 HE.0051 Credit Management
 HE.0073 Dispute Management
 HE.0117 Import/Export Regulations
 HE.0167 Negotiation
 HE.0177 Order-to-cash process
 HE.0181 Payment methods
 HE.0216 Regulatory Policies/Compliance

Trainings

HT.0006 APICS CPIM
 HT.0046 Engineering
 HT.0052 ERP Systems Training
 HT.0123 Safety and Environmental Management (industry specific, company specific and country specific)
 HT.0133 Six Sigma Greenbelt

Processes

sD1.2 Receive, Enter, and Validate Order
 sD1.15 Invoice
 sD2.2 Receive, Configure, Enter and Validate Order
 sD2.15 Invoice
 sD3.15 Invoice
 sSR3.3 Request Excess Product Return Authorization
 sDR3.1 Authorize Excess Product Return

Cross Docking

Basic knowledge of linking, staging and moving received sourced products with/to existing open orders minimizing the need for product inventory or storage.

Aptitudes

HA.0014 Computer Literate

Experiences

HE.0054 Cross Docking

Trainings

HT.0080 ISO Certification

HT.0098 MRP Systems training

Processes

sS1.2 Receive Product

sS2.2 Receive Product

sS3.4 Receive Product

Customer Order Management

The process or the work flow associated with the identification, receipt, acceptance, picking, packing, delivery and of the packed item(s) to a shipping carrier.

Aptitudes

HA.0002 Accurate
HA.0008 Business minded
HA.0014 Computer Literate
HA.0019 Customer Oriented
HA.0026 Diversity Recognition/Respect
HA.0072 Written/Verbal Communication

Experiences

HE.0031 Company terms and conditions
HE.0053 CRM Methods and Tools
HE.0078 Electronic Data Interchange (EDI) Systems
HE.0131 Inventory Management

Trainings

HT.0006 APICS CPIM
HT.0046 Engineering
HT.0080 ISO Certification

Processes

sD1.2 Receive, Enter, and Validate Order
sD1.11 Load Vehicle & Generate Shipping Docs
sD2.2 Receive, Configure, Enter and Validate Order
sD2.11 Load Product & Generate Shipping Docs
sD3.11 Load Product & Generate Shipping Docs

Customer Relationship Management (CRM)

The process for managing a company's relations and interactions with clients and sales prospects, possibly including the synchronization of business processes with the objective of identifying, attracting, and managing new and existing customers.

Aptitudes

HA.0002 Accurate
HA.0004 Analytical
HA.0008 Business minded
HA.0014 Computer Literate
HA.0015 Conflict Resolution Skills
HA.0018 Cross Functional
HA.0019 Customer Oriented
HA.0022 Detail Oriented
HA.0026 Diversity Recognition/Respect
HA.0030 Facilitation ability
HA.0037 Information Management
HA.0039 Leadership
HA.0045 Negotiator
HA.0052 Presentor
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0002 Accounting
HE.0014 Business model and sales channel
HE.0028 Collaborative Planning, Forecasting and Replenishment (CPFR)
HE.0031 Company terms and conditions
HE.0051 Credit Management
HE.0053 CRM Methods and Tools
HE.0057 Customer Relationship Management (CRM)
HE.0058 Customer Requirements Management
HE.0061 Customer Stocking Agreements Management
HE.0078 Electronic Data Interchange (EDI) Systems
HE.0082 Enterprise Business Process
HE.0083 Enterprise Resource Planning (ERP)
HE.0096 Existing internal metrics and relationships
HE.0122 Industry Specific Knowledge and Experience
HE.0123 Industry Specific Regulatory Knowledge
HE.0127 Internal market/SKU segmentation logic
HE.0159 Master Data/Document Management
HE.0160 Material Resource Planning (MRP)
HE.0163 Modeling Techniques
HE.0165 MS Office (Excel, Powerpoint, Word, Access)
HE.0167 Negotiation
HE.0176 Order Processing System/Enterprise Resource Planning Systems Usage (ERP)System

Experiences continued...

HE.0198 Product Life Cycle Management
HE.0199 Product Portfolio understanding
HE.0221 Return Process
HE.0247 Spreadsheet Management
HE.0269 Supply Chain Performance Management/Metrics
HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0302 Vendor Managed Inventory

Trainings

HT.0017 Business model and sales channel
HT.0026 Company Policies, Mission and Strategy, Business Conduct
HT.0046 Engineering
HT.0052 ERP Systems Training
HT.0061 Fork Truck Licensing
HT.0080 ISO Certification
HT.0084 Lean Manufacturing Training
HT.0089 Logistics Management
HT.0095 Mechanic Certification
HT.0101 NDT
HT.0109 Product Specific Training
HT.0133 Six Sigma Greenbelt
HT.0134 Six Sigma Yellow belt
HT.0145 Supply Chain Security

Processes

sP1.1 Identify, Prioritize and Aggregate Supply Chain Requirements
sD1.1 Process Inquiry and Quote
sD1.2 Receive, Enter, and Validate Order
sD2.1 Process Inquiry and Quote
sD2.2 Receive, Configure, Enter and Validate Order
sSR1.1 Identify Defective Product Condition
sDR2.1 Authorize MRO Product Return
sDR2.2 Schedule MRO Return Receipt
sSR3.1 Identify Excess Product Condition

Customer Repair and Return Policy and Process

The actions, tasks and responsibilities concerned with the decision to repair all mechanical/ electrical out of order/broken products in line with the internal return rules.

Aptitudes

HA.0019 Customer Oriented
HA.0022 Detail Oriented
HA.0045 Negotiator
HA.0059 Rules Driven

Experiences

HE.0002 Accounting
HE.0017 Business Rules/Regulatory Policy/Company Return Policy
HE.0051 Credit Management
HE.0067 Defective product handling
HE.0095 Excess product handling
HE.0123 Industry Specific Regulatory Knowledge
HE.0167 Negotiation
HE.0221 Return Process

Trainings

HT.0066 Green systems engineering
HT.0070 Industry specific regulatory certification
HT.0080 ISO Certification
HT.0116 Regulatory Compliance
HT.0129 Scrap Re-Selling
HT.0133 Six Sigma Greenbelt
HT.0134 Six Sigma Yellow belt

Processes

sSR1.3 Request Defective Product Return Authorization
sDR1.1 Authorize Defective Product Return
sSR2.2 Disposition MRO Product
sSR3.3 Request Excess Product Return Authorization
sDR3.1 Authorize Excess Product Return

Customer/Supplier Communication

Process of transferring customer/supplier information by speech or writing

Aptitudes

HA.0006 Builds Collaborative Relationships & Seeks to Build Consensus

Experiences

None Identified

Trainings

HT.0025 Communicating Customer & Supplier Information

Processes

sEP.6 Manage Integrated Supply Chain Transportation
sES.3 Maintain Source Data
sES.4 Manage Product Inventory
sES.6 Manage Incoming Product
sES.10 Manage Supplier Agreements
sEM.6 Manage Transportation (WIP)
sED.3 Manage Deliver Information
sED.4 Manage Finished Goods Inventory
sED.6 Manage Transportation sER.6 Manage Return Transportation

Data management

Working knowledge of the processes required to develop, execute and sustain plans, policies, programs and practices that control, protect, deliver and enhance the value of data and information systems/assets.

Aptitudes

HA.0001 Accountable
HA.0007 Business Knowledge & Acumen (Company specific)
HA.0010 Change Management
HA.0013 Compliance Orientation
HA.0014 Computer Literate
HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving .0
HA.0028 Enabling Technology
HA.0038 Initiative
HA.0056 Process Orientation, Systemic and Conceptual Thinking
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0039 Contract Administration/Management
HE.0066 Data/Document Management
HE.0083 Enterprise Resource Planning (ERP)
HE.0160 Material Resource Planning (MRP)
HE.0205 Project Management
HE.0296 Utilizing Company Specific Business Systems
HE.0297 Utilizing Customer Relationship Management System
HE.0298 Utilizing Finance Systems
HE.0299 Utilizing Transportation Management Systems
HE.0300 Utilizing Warehouse Management Systems

Trainings

HT.0006 APICS CPIM
HT.0046 Engineering
HT.0052 ERP Systems Training
HT.0080 ISO Certification
HT.0098 MRP Systems training
HT.0133 Six Sigma Greenbelt
HT.0135 Software training programs (depends on software)

Process

sEP.3 Manage Plan Data Collection
sS1.2 Receive Product
sS1.3 Verify Product
sS1.4 Transfer Product
sS2.2 Receive Product
sS2.4 Transfer Product
sS3.1 Identify Sources of Supply
sS3.2 Select Final Supplier and Negotiate
sS3.4 Receive Product
sS3.5 Verify Product
sS3.6 Transfer Product
sES.3 Maintain Source Data
sEM.3 Manage Make information
sED.3 Manage Deliver Information
sER.3 Manage Return Data Collection

Defective/Missing Product/Discrepancy Reporting and Resolution

Knowledge of techniques, systems, tools and human skills required to establish effective procedures to identify defective and missing product and then report onward, either internally or externally, ensuring closure on reports and improvements to avoid future repetition.

Aptitudes

HA.0046 Numeracy
HA.0054 Problem Solving
HA.0070 Validation
HA.0072 Written/Verbal Communication

Experiences

HE.0007 Asset Management
HE.0043 Cost Effectiveness
HE.0072 Disposition Resolution
HE.0083 Enterprise Resource Planning (ERP)
HE.0095 Excess product handling
HE.0208 Quality Management Systems
HE.0212 Receiving and Verifying Product
HE.0240 Shelf Life Management
HE.0274 Technical Collaboration

Trainings

HT.0009 Basic and Advanced Business
HT.0026 Company Policies, Mission and Strategy, Business Conduct
HT.0046 Engineering
HT.0052 ERP Systems Training
HT.0060 Forecasting Techniques
HT.0080 ISO Certification
HT.0095 Mechanic Certification
HT.0101 NDT
HT.0109 Product Specific Training
HT.0134 Six Sigma Yellow belt
HT.0145 Supply Chain Security

Processes

sS1.2 Receive Product
sS1.3 Verify Product
sS1.4 Transfer Product
sS1.5 Authorize Supplier Payment
sS2.1 Schedule Product Deliveries
sS2.2 Receive Product
sS2.4 Transfer Product
sS2.5 Authorize Supplier Payment
sS3.3 Schedule Product Deliveries
sS3.4 Receive Product
sS3.5 Verify Product
sS3.6 Transfer Product
sS3.7 Authorize Supplier Payment
sDR3.3 Receive Excess Product

Delivery Balancing

Delivery balancing is one part of Master Scheduling and involves the balancing of deliveries from suppliers against constrained criteria. These criteria may be opening hours, FLT capacity, docking facilities etc. The process involves negotiation with suppliers as well as capacity planning internally

Aptitudes

HA.0019 Customer Oriented

Experiences

HE.0039 Contract Administration/Management

HE.0305 Warehouse/Distribution Management

Trainings

HT.0080 ISO Certification

HT.0098 MRP Systems training

Processes

sS1.1 Schedule Product Deliveries

sS2.1 Schedule Product Deliveries

sS3.3 Schedule Product Deliveries

Delivery Scheduling

Basic knowledge of scheduling and managing sourced product deliveries in order to meet the requirements of inventory replenishment or scheduled production plans

Aptitudes

HA.0011 Collaborative
 HA.0061 Situational Awareness
 HA.0072 Written/Verbal Communication

Experiences

HE.0025 CDR
 HE.0028 Collaborative Planning, Forecasting and Replenishment (CPFR)
 HE.0052 Critical Path
 HE.0136 Item Master
 HE.0182 PDR
 HE.0277 Technical Requirements Understanding
 HE.0311 Written/Verbal Communication

Trainings

HT.0006 APICS CPIM
 HT.0026 Company Policies, Mission and Strategy, Business Conduct
 HT.0052 ERP Systems Training
 HT.0084 Lean Manufacturing Training
 HT.0089 Logistics Management
 HT.0109 Product Specific Training
 HT.0116 Regulatory Compliance
 HT.0145 Supply Chain Security

Processes

sS2.5 Authorize Supplier Payment
 sS3.2 Select Final Supplier and Negotiate
 sS3.3 Schedule Product Deliveries
 sS3.7 Authorize Supplier Payment

Demand Management

The manufacturing management process by which raw materials and production capacity are optimally allocated to meet demand.

Aptitudes

HA.0004 Analytical
HA.0014 Computer Literate
HA.0015 Conflict Resolution Skills
HA.0018 Cross Functional
HA.0030 Facilitation ability
HA.0037 Information Management
HA.0039 Leadership
HA.0045 Negotiator
HA.0052 Presentor
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0010 Basic Finance
HE.0017 Business Rules/Regulatory Policy/Company Return Policy
HE.0048 Cost/Service Modeling
HE.0069 Demand Management
HE.0078 Electronic Data Interchange (EDI) Systems
HE.0082 Enterprise Business Process
HE.0083 Enterprise Resource Planning (ERP)
HE.0096 Existing internal metrics and relationships
HE.0104 Forecasting
HE.0122 Industry Specific Knowledge and Experience
HE.0127 Internal market/SKU segmentation logic
HE.0131 Inventory Management
HE.0150 Make/Buy decision analysis
HE.0159 Master Data/Document Management
HE.0160 Material Resource Planning (MRP)
HE.0162 Materials portfolio and specifications
HE.0163 Modeling Techniques
HE.0165 MS Office (Excel, Powerpoint, Word, Access)
HE.0167 Negotiation
HE.0198 Product Life Cycle Management
HE.0199 Product Portfolio understanding
HE.0200 Product Profitability
HE.0204 Production Planning/Scheduling
HE.0209 Quality processes related to inventory management (test times, shelf life)
HE.0229 Safety Stock Management
HE.0230 Sales and Operations Planning (S&OP)
HE.0241 Shipment Planning/ Order Backlog Manipulation
HE.0247 Spreadsheet Management
HE.0251 Statistical Modeling/Analysis

Experiences continued...

- HE.0263 Supplier production and lead time capabilities
- HE.0264 Supplier Relationship Management (SRM)
- HE.0265 Supplier Service Strategy Agreements
- HE.0269 Supply Chain Performance Management/Metrics

Trainings

- HT.0002 Advanced Excel Techniques
- HT.0006 APICS CPIM
- HT.0017 Business model and sales channel
- HT.0027 Conflict Resolution
- HT.0034 CPFR
- HT.0060 Forecasting Techniques
- HT.0066 Green systems engineering
- HT.0067 IBF Certification
- HT.0070 Industry specific regulatory certification
- HT.0080 ISO Certification
- HT.0102 Negotiation Skills
- HT.0122 S&OP training (Oliver Wight, Tom Wallace or equivalent)
- HT.0127 SCOR-S/SCOR-P Certification
- HT.0129 Scrap Re-Selling
- HT.0133 Six Sigma Greenbelt
- HT.0134 Six Sigma Yellow belt
- HT.0136 Statistics
- HT.0142 Supply Chain Management
- HT.0145 Supply Chain Security
- HT.0154 Vendor Managed Inventory

Processess

- sP1.1 Identify, Prioritize and Aggregate Supply Chain Requirements
- sP1.3 Balance Supply Chain Resources with SC Requirements
- sP2.1 Identify, Prioritize and Aggregate Product Requirements

Design/Engineering Schedule Development

Analyzing the constraints and requirements of a product design cycle in order to evaluate and ensure the timely availability of the product design for building and installation of a product

Aptitudes

HA.0002 Accurate
HA.0014 Computer Literate
HA.0019 Customer Oriented

Experiences

HE.0033 Configuration Management
HE.0080 Engineering Capacity Management
HE.0081 Engineering/Design Management

Trainings

None Identified

Processes

sD3.4 Schedule Installation

Driving certification (according to mode of transportation)

Ownership of the official, valid (not expired) document stating that the person is authorized and able to drive (a) class/es of vehicles

Aptitudes

HA.0024 Diligent
HA.0066 Technology oriented
HA.0069 Trustworthy and Conscientious

Experiences

HE.0061 Customer Stocking Agreements Management
HE.0122 Industry Specific Knowledge and Experience
HE.0211 Reading Maps/Using Navigator

Trainings

HT.0002 Advanced Excel Techniques
HT.0006 APICS CPIM
HT.0017 Business model and sales channel
HT.0145 Supply Chain Security

Processes

sD1.12 Ship Product
sD2.12 Ship Product
sD3.12 Ship Product

EHS regulations

The actions, tasks, and responsibilities concerned with the observance and application of the environment, health, and safety rules and standards.

Aptitudes

HA.0022 Detail Oriented

HA.0072 Written/Verbal Communication

Experiences

HE.0084 Environmental, Health and Safety Systems

Trainings

HT.0050 Environmental regulation

Processes

sD4.7 Deliver and/or install

Enabling Technology

Working awareness of relevant technology that could/can be used to improve the effectiveness or efficiency of operations within Source, but also widely across the Supply Chain or the enterprise. Must be able to deploy with appropriate financial justification using project and change management support.

Aptitudes

HA.0014 Computer Literate

Experiences

HE.0009 Bar Coding/RFID

HE.0083 Enterprise Resource Planning (ERP)

HE.0160 Material Resource Planning (MRP)

Trainings

HT.0002 Advanced Excel Techniques

HT.0006 APICS CPIM

HT.0017 Business model and sales channel

HT.0027 Conflict Resolution

Processes

sS3.1 Identify Sources of Supply

sS3.2 Select Final Supplier and Negotiate

Engineering

The discipline, art and profession of acquiring and applying technical, scientific, and mathematical knowledge to design and implement materials, structures, machines, devices, systems, and processes that safely realize a desired objective or invention

Aptitudes

HA.0001 Accountable
HA.0002 Accurate
HA.0014 Computer Literate
HA.0057 Reliable

Experiences

HE.0033 Configuration Management
HE.0081 Engineering/Design Management
HE.0084 Environmental, Health and Safety Systems
HE.0089 Establishing Engineering and Product Design
HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0216 Regulatory Policies/Compliance
HE.0235 Security and compliance
HE.0249 Standards and testing
HE.0274 Technical Collaboration
HE.0275 Technical Data Understanding
HE.0311 Written/Verbal Communication

Trainings

HT.0006 APICS CPIM
HT.0014 Basic Supply Chain Finance
HT.0102 Negotiation Skills
HT.0122 S&OP training (Oliver Wight, Tom Wallace or equivalent)
HT.0127 SCOR-S/SCOR-P Certification
HT.0136 Statistics
HT.0142 Supply Chain Management
HT.0145 Supply Chain Security

Processes

sS3.1 Identify Sources of Supply
sM1.3 Produce and Test
sM2.3 Produce and Test
sM3.4 Produce and Test
sD1.14 Install Product
sD2.14 Install Product
sD3.3 Enter Order, Commit Resources & Launch Program
sD3.14 Install Product

Enterprise Business Process

The end-to-end (cross-departmental, and often, cross-company) coordination of work activities that create and deliver ultimate value to customers

Aptitudes

HA.0045 Negotiator

Experiences

HE.0069 Demand Management

HE.0083 Enterprise Resource Planning (ERP)

HE.0104 Forecasting

HE.0268 Supply Chain Management

Trainings

HT.0002 Advanced Excel Techniques

HT.0006 APICS CPIM

HT.0007 APICS CSCP

Processes

sP2.1 Identify, Prioritize and Aggregate Product Requirements

Environmental Requirements

Familiarity and understanding of internal and external goals, objectives, rules and laws pertaining to the operation of the Source function within the organization. Must have the ability to manage those requirements on behalf of the organisation to meet strategic goals

Aptitudes

HA.0060 Safe working

Experiences

HE.0112 Hazardous Materials Handling

Trainings

HT.0060 Forecasting Techniques

HT.0076 Inventory Management

HT.0079 ISM CPSM

HT.0097 Modeling Techniques

Processes

sS3.1 Identify Sources of Supply

sS3.2 Select Final Supplier and Negotiate

ERP Systems

Working awareness of and conversant with installing and operating appropriate Enterprise Resource Planning (ERP) systems relevant to the organisation concerned. ERP is defined as an integrated computer based system used to manage internal and external resources including tangible assets, financial resources, materials and human resources.

Aptitudes

HA.0014 Computer Literate
HA.0019 Customer Oriented

Experiences

HE.0009 Bar Coding/RFID
HE.0032 Computer Literate
HE.0067 Defective product handling
HE.0083 Enterprise Resource Planning (ERP)
HE.0086 ERP Software Specific Experience
HE.0131 Inventory Management
HE.0160 Material Resource Planning (MRP)
HE.0176 Order Processing System/Enterprise Resource Planning Systems Usage (ERP)System

Trainings

HT.0002 Advanced Excel Techniques
HT.0006 APICS CPIM
HT.0007 APICS CSCP
HT.0027 Conflict Resolution
HT.0060 Forecasting Techniques
HT.0076 Inventory Management
HT.0079 ISM CPSM
HT.0097 Modeling Techniques
HT.0099 MS Office (Excel, Powerpoint, Word, Access)
HT.0102 Negotiation Skills
HT.0136 Statistics
HT.0147 Team skills training

Processes

sS1.2 Receive Product
sS1.4 Transfer Product
sS2.2 Receive Product
sS2.4 Transfer Product
sS2.5 Authorize Supplier Payment
sS3.4 Receive Product
sS3.6 Transfer Product
sS3.7 Authorize Supplier Payment
sM1.5 Stage Product
sM1.6 Release Product to Deliver
sM2.4 Package
sM2.5 Stage Finished Product
sM2.6 Release Finished Product to Deliver
sM3.2 Schedule Production Activities
sM3.3 Issue Sourced/In-Process Product
sM3.5 Package
sM3.6 Stage Finished Product
sM3.7 Release Product to Deliver
sSR1.5 Return Defective Product
sDR1.1 Authorize Defective Product Return
sDR1.4 Transfer Defective Product
sSR2.2 Disposition MRO Product
sSR2.3 Request MRO Return Authorization
sSR2.5 Return MRO Product
sSR3.5 Return Excess Product

Forecasting

The process of predicting production requirements to meet estimated sales in a particular forecasting period. Considerations include previous sales, the general state of the economy, consumer preferences, and competitive products. Production forecasting decisions affect budgetary and scheduling decisions.

Aptitudes

HA.0004 Analytical
 HA.0011 Collaborative
 HA.0014 Computer Literate

Experiences

HE.0028 Collaborative Planning, Forecasting and Replenishment (CPFR)
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0131 Inventory Management
 HE.0133 Inventory Valuation/Financial Analysis
 HE.0139 Kanban System
 HE.0159 Master Data/Document Management
 HE.0163 Modeling Techniques
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0206 Pull Systems
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0247 Spreadsheet Management
 HE.0302 Vendor Managed Inventory

Trainings

HT.0002 Advanced Excel Techniques
 HT.0006 APICS CPIM
 HT.0007 APICS CSCP
 HT.0021 Capacity Management (Aggregate Planning)
 HT.0034 CPFR
 HT.0060 Forecasting Techniques
 HT.0067 IBF Certification
 HT.0076 Inventory Management
 HT.0079 ISM CPSM
 HT.0097 Modeling Techniques 10.0
 HT.0099 MS Office (Excel, Powerpoint, Word, Access)
 HT.0102 Negotiation Skills
 HT.0111 Production Plan
 HT.0113 Push Systems
 HT.0124 Sales and Operations Planning
 HT.0136 Statistics
 HT.0147 Team skills training

Processes

- sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
- sP4.2 Identify, Assess and Aggregate Delivery Resources
- sP4.3 Balance Delivery Resources and Capabilities with Delivery Requirements
- sP4.4 Establish Delivery Plans
- sP5.1 Assess and Aggregate Return Requirements
- sP5.2 Identify, Assess and Aggregate Return Resources
- sEP.4 Manage Integrated Supply Chain Inventory
- sS1.1 Schedule Product Deliveries
- sS2.1 Schedule Product Deliveries
- sS3.3 Schedule Product Deliveries
- sES.4 Manage Product Inventory
- sEM.4 Manage In-Process Products (WIP)
- sED.4 Manage Finished Goods Inventory
- sER.4 Manage Return Inventory

ID & Damage Inspection

Working knowledge and ability to identify and inspect Sourced products for compliance with contractual part numbers, specifications, drawings, etc, including quality requirements and damage-free product receipt.

Aptitudes

HA.0042 Methodic
HA.0070 Validation

Experiences

HE.0208 Quality Management Systems
HE.0240 Shelf Life Management

Trainings

HT.0002 Advanced Excel Techniques
HT.0006 APICS CPIM
HT.0007 APICS CSCP
HT.0060 Forecasting Techniques
HT.0076 Inventory Management
HT.0079 ISM CPSM
HT.0097 Modeling Techniques
HT.0099 MS Office (Excel, Powerpoint, Word, Access)

Processes

sS1.2 Receive Product
sS1.3 Verify Product
sS2.2 Receive Product
sS3.4 Receive Product
sS3.5 Verify Product

Import/Export Regulations

The knowledge and understanding of the laws and regulations governing the import and export requirements of materials including working with the states, other federal agencies, and foreign governments to ensure compliance with laws governing the import and export of many of these materials.

Aptitudes

HA.0004 Analytical
HA.0014 Computer Literate
HA.0030 Facilitation ability
HA.0039 Leadership
HA.0052 Presentor
HA.0072 Written/Verbal Communication

Experiences

HE.0017 Business Rules/Regulatory Policy/Company Return Policy
HE.0039 Contract Administration/Management
HE.0083 Enterprise Resource Planning (ERP)
HE.0100 Financial Accounting
HE.0116 Import/Export Logistics
HE.0159 Master Data/Document Management
HE.0162 Materials portfolio and specifications
HE.0167 Negotiation
HE.0180 Packaging Configuration and Palletizing
HE.0209 Quality processes related to inventory management (test times, shelf life)
HE.0230 Sales and Operations Planning (S&OP)
HE.0247 Spreadsheet Management
HE.0265 Supplier Service Strategy Agreements
HE.0281 Transport Outsourcing
HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings

HT.0002 Advanced Excel Techniques
HT.0006 APICS CPIM
HT.0007 APICS CSCP
HT.0060 Forecasting Techniques
HT.0076 Inventory Management
HT.0079 ISM CPSM
HT.0096 Microsoft Project
HT.0097 Modeling Techniques
HT.0099 MS Office (Excel, Powerpoint, Word, Access)
HT.0102 Negotiation Skills
HT.0136 Statistics
HT.0147 Team skills training

Processes

- 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
- sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
- sP4.2 Identify, Assess and Aggregate Delivery Resources
- sP5.1 Assess and Aggregate Return Requirements
- sP5.2 Identify, Assess and Aggregate Return Resources
- sS3.1 Identify Sources of Supply
- sS3.2 Select Final Supplier and Negotiate
- sS3.3 Schedule Product Deliveries

Installation Requirements

The information, resources and skills requirements to effectively install purchased products as per customer requirements.

Aptitudes

HA.0014 Computer Literate
HA.0022 Detail Oriented
HA.0072 Written/Verbal Communication

Experiences

HE.0066 Data/Document Management
HE.0125 Industry/product-specific installation experience
HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations

Trainings

HT.0006 APICS CPIM
HT.0037 CSCMP

Processes

sD4.7 Deliver and/or install

Installation Scheduling

The process of managing requirement and constraints associated with a installation schedule in order to effectively schedule product installation as per customer requirements.

Aptitudes

HA.0026 Diversity Recognition/Respect
HA.0072 Written/Verbal Communication

Experiences

HE.0205 Project Management
HE.0237 Service / Installation Management

Trainings

HT.0002 Advanced Excel Techniques
HT.0006 APICS CPIM

Processes

sD3.4 Schedule Installation

Installed base management

Actions, tasks and responsibilities concerned with maintenance and update of info related to the number of units of the company products/platform actually installed and in use around the world.

Aptitudes

HA.0019 Customer Oriented

Experiences

HE.0131 Inventory Management

Trainings

HT.0007 APICS CSCP

Processes

sSR1.5 Return Defective Product

Intellectual Property/Proprietary Data

Conversant with and effectively manage Proprietary Data and Intellectual property on behalf of the organisation. Proprietary Data is defined as internally generated data that contains technical or other types of information controlled by an organisation to safeguard its competitive edge. Proprietary Data may be protected by copyright, patent or trade secret laws in which case it is called Intellectual Property

Aptitudes

HA.0059 Rules Driven

Experiences

HE.0126 Intellectual Property Reporting & Restrictions

Trainings

HT.0060 Forecasting Techniques

HT.0076 Inventory Management

Processes

sS3.1 Identify Sources of Supply

sS3.2 Select Final Supplier and Negotiate

International Trade

The exchange of capital, goods, and services across international borders or territories

Aptitudes

None Identified

Experiences

HE.0129 International business

Trainings

HT.0062 Fundamentals of International Trade

Processes

sEP.1 Manage Business Rules for Plan Process
sEP.7 Manage Planning Configuration
sEP.8 Manage Plan Regulatory Requirements and Compliance
sEP.9 Manage Supply Chain Plan Risk
sES.1 Manage Sourcing Business Rules
sES.7 Manage Supplier Network
sES.8 Manage Import/Export Requirements
sES.9 Manage Supply Chain Source Risk
sEM.1 Manage Production Rules
sEM.7 Manage Production Network
sEM.8 Manage Make Regulatory Environment
sEM.9 Manage Supply Chain Make Risk
sED.1 Manage Deliver Business Rules
sED.7 Manage Product Life Cycle
sED.8 Manage Import/Export Requirements
sED.9 Manage Supply Chain Deliver Risk
sER.1 Manage Business Rules for Return Processes
sER.7 Manage Return Network Configuration
sER.8 Manage Return Regulatory Requirements and Compliance
sER.9 Manage Supply Chain Return Risk

Interpreting Specifications

Basic working knowledge and ability to read, interpret, understand, and effectively communicate (internally and externally) technical specifications and/or drawings to support timely design and delivery of products meeting minimum requirements.

Aptitudes

HA.0072 Written/Verbal Communication

Experiences

HE.0278 Technical Specifications

Trainings

HT.0060 Forecasting Techniques

HT.0076 Inventory Management

Processes

sS2.1 Schedule Product Deliveries

sS3.3 Schedule Product Deliveries

Inventory Management

The formal management of the timing and quantities of goods to be ordered and stocked by an organization in order that demand can always be satisfied without excess expenditure

Aptitudes

- HA.0001 Accountable
- HA.0002 Accurate
- HA.0004 Analytical
- HA.0007 Business Knowledge & Acumen (Company specific)
- HA.0010 Change Management
- HA.0013 Compliance Orientation
- HA.0014 Computer Literate
- HA.0015 Conflict Resolution Skills
- HA.0019 Customer Oriented
- HA.0022 Detail Oriented
- HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
- HA.0030 Facilitation ability
- HA.0038 Initiative
- HA.0039 Leadership
- HA.0045 Negotiator
- HA.0047 Organized
- HA.0052 Presentor
- HA.0053 Prioritization
- HA.0055 Process Improvement
- HA.0056 Process Orientation, Systemic and Conceptual Thinking
- HA.0065 Teamwork & Collaboration
- HA.0070 Validation
- HA.0072 Written/Verbal Communication

Experiences

- HE.0001 ABC Accounting
- HE.0002 Accounting
- HE.0006 Allocation rules and strategy
- HE.0009 Bar Coding/RFID
- HE.0011 Basic Procurement
- HE.0012 Bills of Material/Specs/Fabrication Methodology
- HE.0017 Business Rules/Regulatory Policy/Company Return Policy
- HE.0039 Contract Administration/Management
- HE.0059 Customer Service Strategy Agreements
- HE.0063 Cycle Counting
- HE.0066 Data/Document Management
- HE.0067 Defective product handling
- HE.0069 Demand Management
- HE.0078 Electronic Data Interchange (EDI) Systems
- HE.0083 Enterprise Resource Planning (ERP)
- HE.0085 EOQ management
- HE.0095 Excess product handling

Experiences continued...

HE.0100 Financial Accounting
 HE.0104 Forecasting
 HE.0111 Handling Management
 HE.0112 Hazardous Materials Handling
 HE.0119 Industrial engineering
 HE.0122 Industry Specific Knowledge and Experience
 HE.0131 Inventory Management
 HE.0132 Inventory strategy
 HE.0133 Inventory Valuation/Financial Analysis
 HE.0152 Management of service Strategy agreements with customers
 HE.0159 Master Data/Document Management
 HE.0160 Material Resource Planning (MRP)
 HE.0162 Materials portfolio and specifications
 HE.0163 Modeling Techniques
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0167 Negotiation
 HE.0175 Order Management
 HE.0176 Order Processing System/Enterprise Resource Planning Systems Usage (ERP)System
 HE.0184 Performance/Cost Trade-offs
 HE.0187 Planogram tool usage
 HE.0196 Product display management
 HE.0198 Product Life Cycle Management
 HE.0199 Product Portfolio understanding
 HE.0204 Production Planning/Scheduling
 HE.0205 Project Management
 HE.0209 Quality processes related to inventory management (test times, shelf life)
 HE.0214 Regulatory and company return policy
 HE.0216 Regulatory Policies/Compliance
 HE.0229 Safety Stock Management
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0234 Scrapping procedure
 HE.0247 Spreadsheet Management
 HE.0251 Statistical Modeling/Analysis 10.0
 HE.0263 Supplier production and lead time capabilities 10.0
 HE.0264 Supplier Relationship Management (SRM) 10.0
 HE.0265 Supplier Service Strategy Agreements 10.0
 HE.0300 Utilizing Warehouse Management Systems 10.0
 HE.0302 Vendor Managed Inventory 10.0
 HE.0304 Warehouse Experience 10.0
 HE.0305 Warehouse/Distribution Management 10.0
 HE.0307 Waste Disposal Procedure 10.0
 HE.0311 Written/Verbal Communication

Trainings

HT.0002 Advanced Excel Techniques
HT.0006 APICS CPIM
HT.0007 APICS CSCP
HT.0011 Basic Inventory Concepts
HT.0018 C.P.I.M. Certification
HT.0037 CSCMP
HT.0038 CTL
HT.0039 CTPAT
HT.0045 Enabling Technology
HT.0060 Forecasting Techniques
HT.0073 Introduction to Supply Chain
HT.0076 Inventory Management
HT.0079 ISM CPSM
HT.0097 Modeling Techniques
HT.0099 MS Office (Excel, Powerpoint, Word, Access)
HT.0102 Negotiation Skills
HT.0127 SCOR-S/SCOR-P Certification
HT.0136 Statistics
HT.0140 Supplier Relationship Management (SRM)
HT.0146 Taxes/Duties Education
HT.0147 Team skills training

Processes

sP1.2 Identify, Prioritize and Aggregate Supply Chain Resources
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
sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
sP4.2 Identify, Assess and Aggregate Delivery Resources
sP4.3 Balance Delivery Resources and Capabilities with Delivery Requirements
sP4.4 Establish Delivery Plans
sP5.1 Assess and Aggregate Return Requirements
sP5.2 Identify, Assess and Aggregate Return Resources
sP5.3 Balance Return Resources with Return Requirements
sEP.4 Manage Integrated Supply Chain Inventory
sS1.2 Receive Product
sS1.4 Transfer Product
sS2.2 Receive Product
sS2.4 Transfer Product
sS3.4 Receive Product
sS3.6 Transfer Product
sES.4 Manage Product Inventory
sM1.2 Issue Material
sM1.5 Stage Product
sM1.6 Release Product to Deliver
sM2.2 Issue Sourced/In-Process Product
sM2.5 Stage Finished Product

Processes continued...

sM2.2 Issue Sourced/In-Process Product
sM2.5 Stage Finished Product
sM2.6 Release Finished Product to Deliver
sM3.6 Stage Finished Product
sM3.7 Release Product to Deliver
sEM.4 Manage In-Process Products (WIP)
sD1.3 Reserve Inventory and Determine Delivery Date
sD2.3 Reserve Inventory and Determine Delivery Date
sD4.2 Receive Product at Store
sD4.3 Pick Product from backroom
sD4.4 Stock Shelf
sED.4 Manage Finished Goods Inventory
sSR1.2 Disposition Defective Product
sDR1.1 Authorize Defective Product Return
sDR1.2 Schedule Defective Return Receipt
sDR1.4 Transfer Defective Product
sSR2.2 Disposition MRO Product
sSR2.3 Request MRO Return Authorization
sDR2.1 Authorize MRO Product Return
sDR2.4 Transfer MRO Product
sSR3.2 Disposition Excess Product
sSR3.5 Return Excess Product
sDR3.1 Authorize Excess Product Return
sDR3.2 Schedule Excess Return Receipt
sDR3.3 Receive Excess Product
sDR3.4 Transfer Excess Product
sER.4 Manage Return Inventory
sDR3.4 Transfer Excess Product
sER.4 Manage Return Inventory

Issue Proposal/Quote

The compilation of all required specifications and details need to generate and communicate an RFP/Q.

Aptitudes

None Identified

Experiences

HE.0210 Quotation/CRM tool

Trainings

HT.0006 APICS CPIM

Processes

sD3.1 Obtain and Respond to RFP/RFQ

Item Master/BOM/BoL Interpretation

The ability to understand, interpret and effectively communicate a part master record (item master) or bill of materials (BOM) of parts lists that details description, unit of measure, dimensions, group/family classification, production or sourcing data, quality requirements and/or restrictions, and other pertinent information. Such item masters and BOMs are generally maintained within ERP or MRP systems.

Aptitudes

None Identified

Experiences

HE.0294 Unit of Measure Understanding

HE.0306 Warehousing Min/Max Shelf Life

Trainings

HT.0037 CSCMP

HT.0127 SCOR-S/SCOR-P Certification

Processes

sS2.5 Authorize Supplier Payment

sS3.7 Authorize Supplier Payment

Kitting/Packing

The process of aggregating and packing all elements belonging to a customer order.

Aptitudes

HA.0014 Computer Literate
HA.0031 Feedback Acceptance

Experiences

HE.0066 Data/Document Management
HE.0131 Inventory Management
HE.0180 Packaging Configuration and Palletizing
HE.0202 Product/Supplier Knowledge
HE.0305 Warehouse/Distribution Management

Trainings

HT.0006 APICS CPIM
HT.0038 CTL
HT.0132 Six Sigma Certification

Processes

sD1.10 Pack Product
sD2.10 Pack Product
sD3.10 Pack Product

Labor Costs Verification

Capability of calculating, understanding, reporting on, and if necessary, be able to taking corrective action to control labour costs within one's area of responsibility against budgets or objectives that have been set. Labour cost is defined as the total expenditure borne by employers in order to employ workers and goes beyond straight wages or salaries.

Aptitudes

HA.0059 Rules Driven

Experiences

HE.0239 Service Provider Agreements

Trainings

None Identified

Processes

sS2.1 Schedule Product Deliveries

sS2.5 Authorize Supplier Payment

sS3.7 Authorize Supplier Payment

Lead-time validation

The process of analyzing and validating feasibility of customer required lead-times.

Aptitudes

None Identified

Experiences

HE.0008 ATP logic/calculation

HE.0083 Enterprise Resource Planning (ERP)

HE.0238 Service level calculation tools and metrics

Trainings

HT.0038 CTL

HT.0039 CTPAT

HT.0127 SCOR-S/SCOR-P Certification

Processes

sD1.2 Receive, Enter, and Validate Order

sD2.2 Receive, Configure, Enter and Validate Order

Lean Manufacturing

The process of identifying processes that impede the optimization of production. By using various principles (value stream mapping, five s, root cause analysis) identify waste and/or process inefficiencies with the goal of optimizing production.

Aptitudes

HA.0004 Analytical
 HA.0014 Computer Literate
 HA.0016 Continuous learning
 HA.0030 Facilitation ability
 HA.0039 Leadership
 HA.0071 Work Control

Experiences

HE.0033 Configuration Management
 HE.0038 Continuous learning
 HE.0044 Cost Management
 HE.0055 Cross training
 HE.0065 Data Collection/Input
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0103 Flow Manufacturing
 HE.0114 Hoshin Kanri
 HE.0133 Inventory Valuation/Financial Analysis
 HE.0138 Just-In-Time Inventory
 HE.0139 Kanban System
 HE.0144 Lean Manufacturing
 HE.0149 Logistics sourcing strategy and contract management
 HE.0159 Master Data/Document Management
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0190 Point of Use Storage
 HE.0191 Preventative Maintenance
 HE.0192 Process Engineering
 HE.0194 Process management
 HE.0206 Pull Systems
 HE.0208 Quality Management Systems
 HE.0225 Root cause analysis
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0243 Single Minute Exchange of Dies
 HE.0247 Spreadsheet Management
 HE.0250 Statistical control techniques
 HE.0251 Statistical Modeling/Analysis
 HE.0259 Supplier Data Exchange
 HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times
 HE.0301 Value Stream Mapping
 HE.0308 Water Spider

Trainings

HT.0006 APICS CPIM
HT.0037 CSCMP
HT.0038 CTL
HT.0039 CTPAT
HT.0060 Forecasting Techniques
HT.0084 Lean Manufacturing Training
HT.0132 Six Sigma Certification
HT.0146 Taxes/Duties Education

Processess

sP5.2 Identify, Assess and Aggregate Return Resources
sP5.3 Balance Return Resources with Return Requirements
sP5.4 Establish and Communicate Return Plans
sEP.7 Manage Planning Configuration
sS1.4 Transfer Product
sS2.1 Schedule Product Deliveries
sS2.4 Transfer Product
sS3.3 Schedule Product Deliveries
sS3.5 Verify Product
sES.1 Manage Sourcing Business Rules
sES.2 Assess Supplier Performance
sES.7 Manage Supplier Network
sM1.1 Schedule Production Activities
sM1.2 Issue Material
sM1.3 Produce and Test
sM1.5 Stage Product
sM2.1 Schedule Production Activities
sM2.2 Issue Sourced/In-Process Product
sM2.3 Produce and Test
sM2.5 Stage Finished Product
sM3.4 Produce and Test
sM3.6 Stage Finished Product
sEM.1 Manage Production Rules
sEM.4 Manage In-Process Products (WIP)
sEM.7 Manage Production Network
sED.7 Manage Product Life Cycle
sER.7 Manage Return Network Configuration

Legislation and Standards

Legislation and Standards affect many parts of the Source activity. The context here is receiving product and relates to general legislation affecting the product being received as well as the specific standards or specifications that applies to the product. Knowledge and experience is required to manage conformance systems and actions to be taken when out of conformance is detected.

Aptitudes

None Identified

Experiences

HE.0084 Environmental, Health and Safety Systems

HE.0110 Government Regulations

HE.0134 ISO Compliance

Trainings

HT.0006 APICS CPIM

HT.0037 CSCMP

HT.0038 CTL

HT.0039 CTPAT

HT.0060 Forecasting Techniques

Processes

sS1.2 Receive Product

sS1.4 Transfer Product

sS2.2 Receive Product

sS2.4 Transfer Product

sS3.4 Receive Product

sS3.6 Transfer Product

Linear programming

The branch of mathematics concerned with the minimization or maximization of a linear function of several variables and inequalities; used in many branches of industry to minimize costs or maximize production

Aptitudes

HA.0004 Analytical
HA.0014 Computer Literate
HA.0030 Facilitation ability
HA.0067 Thinking & Problem Solving

Experiences

HE.0083 Enterprise Resource Planning (ERP)
HE.0104 Forecasting
HE.0159 Master Data/Document Management
HE.0163 Modeling Techniques
HE.0165 MS Office (Excel, Powerpoint, Word, Access)
HE.0230 Sales and Operations Planning (S&OP)
HE.0247 Spreadsheet Management

Trainings

HT.0084 Lean Manufacturing Training

Processes

sP5.3 Balance Return Resources with Return Requirements

Load Building

The process of order consolidation to meet service, cost, delivery and product specification requirements.

Aptitudes

HA.0002 Accurate
HA.0014 Computer Literate
HA.0054 Problem Solving
HA.0068 Time Management

Experiences

HE.0071 Dispatch procedures
HE.0112 Hazardous Materials Handling
HE.0147 Load building process and control

Trainings

HT.0006 APICS CPIM
HT.0038 CTL
HT.0060 Forecasting Techniques

Processes

sD1.5 Build Loads
sD2.5 Build Loads
sD3.5 Build Loads

Logistics Management

The process for planning, implementing, and controlling the efficient, effective, forward, and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements and thus add value for the customer.

Aptitudes

- HA.0002 Accurate
- HA.0004 Analytical
- HA.0011 Collaborative
- HA.0014 Computer Literate
- HA.0022 Detail Oriented
- HA.0030 Facilitation ability
- HA.0035 Good Judgment Execution
- HA.0039 Leadership
- HA.0045 Negotiator
- HA.0054 Problem Solving
- HA.0059 Rules Driven
- HA.0068 Time Management
- HA.0070 Validation
- HA.0072 Written/Verbal Communication

Experiences

- HE.0002 Accounting
- HE.0009 Bar Coding/RFID
- HE.0017 Business Rules/Regulatory Policy/Company Return Policy
- HE.0020 Carrier Agreement Implementation
- HE.0021 Carrier performance management
- HE.0039 Contract Administration/Management
- HE.0044 Cost Management
- HE.0046 Cost/Benefit Analysis
- HE.0053 CRM Methods and Tools
- HE.0068 Delivery Scheduling
- HE.0083 Enterprise Resource Planning (ERP)
- HE.0095 Excess product handling
- HE.0097 External Supplier Systems Interface
- HE.0099 Finance
- HE.0100 Financial Accounting
- HE.0104 Forecasting
- HE.0107 Freight Management
- HE.0117 Import/Export Regulations
- HE.0123 Industry Specific Regulatory Knowledge
- HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
- HE.0152 Management of service Strategy agreements with customers
- HE.0159 Master Data/Document Management

Experiences continued...

HE.0163 Modeling Techniques
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0167 Negotiation
 HE.0184 Performance/Cost Trade-offs
 HE.0204 Production Planning/Scheduling
 HE.0216 Regulatory Policies/Compliance
 HE.0221 Return Process
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0239 Service Provider Agreements
 HE.0242 Shipping Document Creation/Management
 HE.0247 Spreadsheet Management
 HE.0258 Supplier Certification
 HE.0282 Transportation Inbound/Outbound
 HE.0283 Transportation Consolidation
 HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times
 HE.0285 Transportation Paperwork
 HE.0287 Transportation Rating/Pricing
 HE.0289 Transportation Scheduling
 HE.0290 Transportation Tracking
 HE.0292 Transportation/Freight Management
 HE.0293 Transportation/Warehouse Management systems (TMS/WMS)
 HE.0305 Warehouse/Distribution Management
 HE.0311 Written/Verbal Communication

Trainings

HT.0003 Advanced Negotiations/Collaborative Planning
 HT.0005 Agreement construct/Legal requirements
 HT.0006 APICS CPIM
 HT.0008 Automation Tools
 HT.0022 CAPS
 HT.0024 Certification Schemes
 HT.0028 Contract Management
 HT.0033 Cost/Price Analysis
 HT.0036 Cross Docking
 HT.0043 Electronic Data Exchange Systems
 HT.0044 Electronic Identification Systems
 HT.0046 Engineering
 HT.0047 Enterprise & Material Resource Planning Systems
 HT.0049 Enterprise Strategic Business Rules
 HT.0052 ERP Systems Training
 HT.0056 Federal/National/International Regulatory Compliance
 HT.0076 Inventory Management
 HT.0080 ISO Certification
 HT.0084 Lean Manufacturing Training
 HT.0090 Logistics Operations
 HT.0091 Managing Hazardous Materials
 HT.0098 MRP Systems training
 HT.0102 Negotiation Skills
 HT.0104 Occupational Safety & Health

Trainings continued...

- HT.0106 Packaging and palletizing
- HT.0112 Project Management
- HT.0114 Quality Management Systems
- HT.0117 Requirements traceability
- HT.0123 Safety and Environmental Management (industry specific, company specific and country specific)
- HT.0127 SCOR-S/SCOR-P Certification
- HT.0128 SCORmark
- HT.0132 Six Sigma Certification
- HT.0142 Supply Chain Management
- HT.0151 Trade-offs in Logistics Costs
- HT.0155 Warehouse Management

Processes

- sP5.4 Establish and Communicate Return Plans
- sEP.7 Manage Planning Configuration
- sEP.9 Manage Supply Chain Plan Risk
- sS1.1 Schedule Product Deliveries
- sS1.2 Receive Product
- sS1.4 Transfer Product
- sS2.1 Schedule Product Deliveries
- sS2.2 Receive Product
- sS2.4 Transfer Product
- sS2.5 Authorize Supplier Payment
- sS3.3 Schedule Product Deliveries
- sS3.4 Receive Product
- sS3.6 Transfer Product
- sS3.7 Authorize Supplier Payment
- sES.7 Manage Supplier Network
- sES.9 Manage Supply Chain Source Risk
- sM1.5 Stage Product
- sM1.6 Release Product to Deliver
- sM2.5 Stage Finished Product
- sM2.6 Release Finished Product to Deliver
- sM3.6 Stage Finished Product
- sM3.7 Release Product to Deliver
- sEM.7 Manage Production Network
- sEM.9 Manage Supply Chain Make Risk
- sD1.7 Select Carriers and Rate Shipments
- sD1.11 Load Vehicle & Generate Shipping Docs
- sD2.7 Select Carriers and Rate Shipments
- sD2.11 Load Product & Generate Shipping Docs
- sD3.7 Select Carriers & Rate Shipments
- sD3.11 Load Product & Generate Shipping Docs
- sD4.1 Receive Product at the Store
- sED.7 Manage Product Life Cycle
- sED.9 Manage Supply Chain Deliver Risk
- sSR1.3 Request Defective Product Return Authorization
- sSR1.4 Schedule Defective Product Shipment

Processes continued...

sSR1.5 Return Defective Product
sDR1.2 Schedule Defective Return Receipt
sDR1.3 Receive Defective Product (includes verify)
sSR2.3 Request MRO Return Authorization
sSR2.4 Schedule MRO Shipment
sSR2.5 Return MRO Product
sDR2.1 Authorize MRO Product Return
sDR2.2 Schedule MRO Return Receipt
sSR3.3 Request Excess Product Return Authorization
sSR3.4 Schedule Excess Product Shipment
sSR3.5 Return Excess Product
sDR3.1 Authorize Excess Product Return
sDR3.2 Schedule Excess Return Receipt
sDR3.3 Receive Excess Product
sER.7 Manage Return Network Configuration
sER.9 Manage Supply Chain Return Risk

Logistics network modeling

The process of planning, implementing, and controlling the efficient, effective forward and reverse flow and storage of goods, services, and related information between the point of origin and the point of consumption in order to meet customers' requirements.

Aptitudes

HA.0004 Analytical
HA.0014 Computer Literate
HA.0067 Thinking & Problem Solving

Experiences

HE.0083 Enterprise Resource Planning (ERP)
HE.0159 Master Data/Document Management
HE.0163 Modeling Techniques
HE.0165 MS Office (Excel, Powerpoint, Word, Access)
HE.0180 Packaging Configuration and Palletizing
HE.0247 Spreadsheet Management
HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0293 Transportation/Warehouse Management systems (TMS/WMS)

Trainings

HT.0028 Contract Management
HT.0029 Contract Negotiation
HT.0036 Cross Docking
HT.0043 Electronic Data Exchange Systems
HT.0044 Electronic Identification Systems
HT.0049 Enterprise Strategic Business Rules
HT.0052 ERP Systems Training
HT.0056 Federal/National/International Regulatory Compliance
HT.0063 General Accounting
HT.0065 Green Procurement
HT.0076 Inventory Management
HT.0084 Lean Manufacturing Training
HT.0090 Logistics Operations
HT.0098 MRP Systems training
HT.0104 Occupational Safety & Health
HT.0112 Project Management
HT.0114 Quality Management Systems
HT.0120 Risk Management
HT.0127 SCOR-S/SCOR-P Certification
HT.0132 Six Sigma Certification
HT.0139 Subcontracting Management
HT.0142 Supply Chain Management
HT.0153 Transportation/Logistics

Processes

- sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
- sP4.2 Identify, Assess and Aggregate Delivery Resources
- sP4.3 Balance Delivery Resources and Capabilities with Delivery Requirements
- sP4.4 Establish Delivery Plans
- sP5.1 Assess and Aggregate Return Requirements
- sP5.2 Identify, Assess and Aggregate Return Resources

Logistics/Freight

Working knowledge of the management and integration of information, sourced product/material, transportation, inventory, warehousing, material-handling, and packaging, and occasionally security, between the point of origin and the point of consumption in order to meet customer requirements.

Aptitudes

HA.0011 Collaborative

Experiences

HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings

HT.0056 Federal/National/International Regulatory Compliance

HT.0080 ISO Certification

HT.0142 Supply Chain Management

Processes

sS1.2 Receive Product

sS2.2 Receive Product

sS3.4 Receive Product

Performance Management

A framework that identifies opportunities for performance improvement through use of performance measures such as standards and indicators.

Aptitudes

HA.0007 Business Knowledge & Acumen (Company specific)
HA.0009 Business Performance Management

Experiences

HE.0153 Managing and Measuring Performance
HE.0172 Operations

Trainings

HT.0032 Cost Reduction Efforts
HT.0073 Introduction to Supply Chain

Processes

sEP.2 Manage Performance of Supply Chain
sES.2 Assess Supplier Performance
sEM.2 Manage Production Performance

Manufacturing Resource Commitment

The efficient and effective allocation of an organization's manufacturing resources and assets with the objective of meeting customer demands/requirements.

Aptitudes

None Identified

Experiences

HA.0002 Accurate

Trainings

None Identified

Processes

sD3.3 Enter Order, Commit Resources & Launch Program

Master Scheduling

Knowledge of co-ordinating and keeping track of all the different components related to the Source activity. Individual activities e.g. deliveries, orders, clearances, contract negotiations etc. will have their own schedules but an overall perspective needs to be maintained both for the Source activity and the smooth operation of the whole Supply Chain

Aptitudes

HA.0011 Collaborative
 HA.0014 Computer Literate
 HA.0068 Time Management
 HA.0072 Written/Verbal Communication

Experiences

HE.0009 Bar Coding/RFID
 HE.0017 Business Rules/Regulatory Policy/Company Return Policy
 HE.0032 Computer Literate
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0084 Environmental, Health and Safety Systems
 HE.0160 Material Resource Planning (MRP)

Trainings

HT.0005 Agreement construct/Legal requirements
 HT.0021 Capacity Management (Aggregate Planning)
 HT.0024 Certification Schemes
 HT.0029 Contract Negotiation
 HT.0044 Electronic Identification Systems
 HT.0046 Engineering
 HT.0049 Enterprise Strategic Business Rules
 HT.0052 ERP Systems Training
 HT.0056 Federal/National/International Regulatory Compliance
 HT.0076 Inventory Management
 HT.0080 ISO Certification
 HT.0084 Lean Manufacturing Training
 HT.0090 Logistics Operations
 HT.0091 Managing Hazardous Materials
 HT.0098 MRP Systems training
 HT.0114 Quality Management Systems
 HT.0132 Six Sigma Certification

Processes

- sEP.3 Manage Plan Data Collection
- sEP.4 Manage Integrated Supply Chain Inventory
- sEP.5 Manage Integrated Supply Chain Capital Assets
- sEP.6 Manage Integrated Supply Chain Transportation
- sEP.7 Manage Planning Configuration
- sEP.8 Manage Plan Regulatory Requirements and Compliance
- sEP.9 Manage Supply Chain Plan Risk
- sEP.10 Align Supply Chain Unit Plan with Financial Plan
- sS1.1 Schedule Product Deliveries
- sS1.5 Authorize Supplier Payment
- sS2.1 Schedule Product Deliveries
- sS2.5 Authorize Supplier Payment
- sS3.3 Schedule Product Deliveries
- sS3.7 Authorize Supplier Payment
- sES.1 Manage Sourcing Business Rules
- sEM.1 Manage Production Rules

Material handling equipment usage

The ability to manipulate various types of material handling systems (e.g. forklifts, conveyors, palletizers, etc.) to pick, pack, and store orders and inventory.

Aptitudes

HA.0014 Computer Literate
 HA.0031 Feedback Acceptance
 HA.0069 Trustworthy and Conscientious

Experiences

HE.0009 Bar Coding/RFID
 HE.0066 Data/Document Management
 HE.0105 Forklift or Other Material Handling Equipment Experience
 HE.0131 Inventory Management
 HE.0202 Product/Supplier Knowledge
 HE.0227 Safety Requirements
 HE.0305 Warehouse/Distribution Management

Trainings

HT.0001 Advanced Accounting principles
 HT.0004 Advertising Methodologies
 HT.0006 APICS CPIM
 HT.0015 Blanket Purchase Agreements
 HT.0028 Contract Management
 HT.0037 CSCMP
 HT.0049 Enterprise Strategic Business Rules
 HT.0052 ERP Systems Training
 HT.0063 General Accounting
 HT.0064 General Procurement & Subcontracting
 HT.0079 ISM CPSM
 HT.0084 Lean Manufacturing Training
 HT.0098 MRP Systems training
 HT.0108 Procurement/Subcontracting On Job Training
 HT.0114 Quality Management Systems
 HT.0127 SCOR-S/SCOR-P Certification
 HT.0132 Six Sigma Certification
 HT.0142 Supply Chain Management
 HT.0153 Transportation/Logistics

Processes

- sD1.8 Receive Product from Source or Make
- sD1.9 Pick Product
- sD1.10 Pack Product
- sD1.11 Load Vehicle & Generate Shipping Docs
- sD2.8 Receive Product from Source or Make
- sD2.9 Pick Product
- sD2.10 Pack Product
- sD2.11 Load Product & Generate Shipping Docs
- sD3.8 Receive Product from Source or Make
- sD3.9 Pick Product
- sD3.10 Pack Product
- sD3.11 Load Product & Generate Shipping Docs
- sD4.2 Receive Product at Store
- sD4.3 Pick Product from backroom
- sD4.4 Stock Shelf
- sD4.7 Deliver and/or install
- sDR2.4 Transfer MRO Product

Milestone/Performance Payments

Working knowledge of contractual requirements for the authorization of monetary payments for the successful completion of pre-defined development or performance milestones

Aptitudes

HA.0014 Computer Literate
HA.0072 Written/Verbal Communication

Experience

HE.0262 Supplier Performance Assessment

Trainings

HT.0056 Federal/National/International Regulatory Compliance
HT.0057 Financial Accounting
HT.0065 Green Procurement
HT.0078 IP, Technology patents and copyrights

Processes

sS3.1 Identify Sources of Supply
sS3.2 Select Final Supplier and Negotiate
sS3.3 Schedule Product Deliveries

MPS Methodologies and Techniques

The techniques used in material requirements planning systems to develop a detailed plan for product manufacturing. The master production schedule takes account of the requirements of various departments, including sales (delivery dates), finance (inventory minimization), and manufacturing (minimization of setup times) to schedule production and the purchasing of materials within the capacity of and resources available to the production system.

Aptitudes

HA.0004 Analytical
HA.0014 Computer Literate
HA.0018 Cross Functional
HA.0030 Facilitation ability
HA.0039 Leadership
HA.0052 Presentor
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0012 Bills of Material/Specs/Fabrication Methodology
HE.0019 Capital planning
HE.0083 Enterprise Resource Planning (ERP)
HE.0096 Existing internal metrics and relationships
HE.0142 Lead time management
HE.0150 Make/Buy decision analysis
HE.0160 Material Resource Planning (MRP)
HE.0165 MS Office (Excel, Powerpoint, Word, Access)
HE.0230 Sales and Operations Planning (S&OP)
HE.0247 Spreadsheet Management

Trainings

HT.0028 Contract Management
HT.0057 Financial Accounting
HT.0064 General Procurement & Subcontracting
HT.0080 ISO Certification
HT.0108 Procurement/Subcontracting On Job Training
HT.0127 SCOR-S/SCOR-P Certification

Processes

sP1.2 Identify, Prioritize and Aggregate Supply Chain Resources
sP3.1 Identify, Prioritize and Aggregate Production Requirements

MRO Management

All actions which have the objective of retaining or restoring an item in or to a state in which it can perform its required function. The actions include the combination of all technical and corresponding administrative, managerial, and supervision actions

Aptitudes

None Identified

Experiences

HE.0164 MRO management

Trainings

None Identified

Processes

sER.1 Manage Business Rules for Return Processes

sER.7 Manage Return Network Configuration

MRP Systems

The process of ensuring materials and products are available for production and delivery to customers, maintaining the lowest possible level of inventory and planning manufacturing activities, delivery schedules and purchasing activities.

Aptitudes

None Identified

Experiences

HE.0016 Business plans
HE.0036 Construction reasoning
HE.0075 DOT/EPA
HE.0104 Forecasting
HE.0158 Master build plan
HE.0160 Material Resource Planning (MRP)
HE.0203 Production build process

Trainings

HT.0001 Advanced Accounting principles
HT.0010 Basic and Advanced Finance
HT.0028 Contract Management
HT.0046 Engineering
HT.0094 Material Planning Process
HT.0116 Regulatory Compliance

Processes

sEP.4 Manage Integrated Supply Chain Inventory
sS1.4 Transfer Product
sES.1 Manage Sourcing Business Rules
sES.9 Manage Supply Chain Source Risk
sM1.4 Package
sM3.2 Schedule Production Activities
sM3.3 Issue Sourced/In-Process Product
sEM.1 Manage Production Rules

MSDS/CoC/BoL/Environmental Interpretation

Working knowledge and understanding of strict regulatory adherence to health and environmental requirements/restrictions associated with particular products as detailed on Material Safety Data Sheets (MSDS) or Certificates of Compliance CoC), throughout product ordering, receipt, storage, stage, transport and final delivery.

Aptitudes

HA.0060 Safe working
HA.0061 Situational Awareness

Experiences

HE.0112 Hazardous Materials Handling
HE.0227 Safety Requirements

Trainings

HT.0028 Contract Management
HT.0064 General Procurement & Subcontracting
HT.0087 Legal Rules
HT.0108 Procurement/Subcontracting On Job Training
HT.0132 Six Sigma Certification

Processes

sS1.1 Schedule Product Deliveries
sS1.2 Receive Product
sS1.3 Verify Product
sS1.4 Transfer Product
sS2.1 Schedule Product Deliveries
sS2.2 Receive Product
sS2.4 Transfer Product
sS3.3 Schedule Product Deliveries
sS3.4 Receive Product
sS3.5 Verify Product
sS3.6 Transfer Product

Office automation tools

Familiarity with relevant Office Automation Tools and be able to deploy against financial justification as appropriate taking account of project and change management requirements. Office Automation Tools are defined as all tools and methods that can be applied to office activities which make it possible to improve effectiveness or efficiency of those activities.

Aptitudes

HA.0014 Computer Literate

Experiences

HE.0165 MS Office (Excel, Powerpoint, Word, Access)

Trainings

HT.0108 Procurement/Subcontracting On Job Training

HT.0132 Six Sigma Certification

Processes

sS1.3 Verify Product

sS3.5 Verify Product

Optimization

The process of improving various aspects of the business resulting in (such as) increased profits, improved product or greater customer satisfaction.

Aptitudes

HA.0007 Business Knowledge & Acumen (Company specific) 10.0
 HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving 10.0
 HA.0028 Enabling Technology

Experiences

HE.0018 Capacity planning
 HE.0046 Cost/Benefit Analysis
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0119 Industrial engineering
 HE.0122 Industry Specific Knowledge and Experience
 HE.0174 Optimization software
 HE.0233 SCOR
 HE.0268 Supply Chain Management

Trainings

HT.0048 Enterprise Optimization
 HT.0060 Forecasting Techniques
 HT.0065 Green Procurement
 HT.0084 Lean Manufacturing Training
 HT.0116 Regulatory Compliance
 HT.0149 Techniques of Detailed Capacity Planning Process

Processes

sEP.1 Manage Business Rules for Plan Process
 sEP.7 Manage Planning Configuration
 sES.1 Manage Sourcing Business Rules
 sES.7 Manage Supplier Network
 sM1.1 Schedule Production Activities
 sM2.1 Schedule Production Activities
 sEM.1 Manage Production Rules
 sEM.7 Manage Production Network
 sED.1 Manage Deliver Business Rules
 sED.7 Manage Product Life Cycle
 sER.1 Manage Business Rules for Return Processes
 sER.7 Manage Return Network Configuration

Order Management

The process or the work flow associated with the identification, receipt, acceptance, picking, packing, delivery and of the packed item(s) to a shipping carrier.

Aptitudes

HA.0002 Accurate
HA.0008 Business minded
HA.0014 Computer Literate
HA.0019 Customer Oriented
HA.0026 Diversity Recognition/Respect
HA.0071 Work Control
HA.0072 Written/Verbal Communication

Experiences

HE.0031 Company terms and conditions
HE.0053 CRM Methods and Tools
HE.0078 Electronic Data Interchange (EDI) Systems
HE.0083 Enterprise Resource Planning (ERP)
HE.0098 Fast track, partial delivery
HE.0106 Forwarder management
HE.0167 Negotiation
HE.0175 Order Management
HE.0204 Production Planning/Scheduling
HE.0238 Service level calculation tools and metrics
HE.0270 Supply chain planning
HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0289 Transportation Scheduling

Trainings

HT.0003 Advanced Negotiations/Collaborative Planning
HT.0025 Communicating Customer & Supplier Information
HT.0033 Cost/Price Analysis
HT.0047 Enterprise & Material Resource Planning Systems
HT.0049 Enterprise Strategic Business Rules
HT.0056 Federal/National/International Regulatory Compliance
HT.0084 Lean Manufacturing Training
HT.0108 Procurement/Subcontracting On Job Training
HT.0112 Project Management
HT.0127 SCOR-S/SCOR-P Certification
HT.0128 SCORmark

Processes

sS1.1 Schedule Product Deliveries
sS2.1 Schedule Product Deliveries
sS2.2 Receive Product
sS3.3 Schedule Product Deliveries
sD1.3 Reserve Inventory and Determine Delivery Date
sD1.4 Consolidate Orders
sD2.3 Reserve Inventory and Determine Delivery Date
sD2.4 Consolidate Orders
sD3.3 Enter Order, Commit Resources & Launch Program
sED.1 Manage Deliver Business Rules
sDR2.1 Authorize MRO Product Return
sDR2.2 Schedule MRO Return Receipt
sDR2.3 Receive MRO Product
sDR2.4 Transfer MRO Product

Outsourcing

A company that contracts with another company to provide services that might otherwise be performed by in-house employees

Aptitudes

None Identified

Experiences

HE.0179 Outsourcing

HE.0258 Supplier Certification

Trainings

HT.0105 Outsourcing

Processes

sEP.7 Manage Planning Configuration

sES.7 Manage Supplier Network

sEM.7 Manage Production Network

sED.7 Manage Product Life Cycle

sER.7 Manage Return Network Configuration

Packaging

The processes of coordinating a system of preparing goods for transport, warehousing, logistics, sale, and end use. This process includes any written, electronic, or graphic communications on the packaging or on a separate but associated label.

Aptitudes

HA.0050 Physical ability

Experiences

HE.0037 Container optimization

HE.0119 Industrial engineering

HE.0148 Local/national/global transportation guidelines

HE.0180 Packaging Configuration and Palletizing

Trainings

HT.0043 Electronic Data Exchange Systems

HT.0076 Inventory Management

HT.0080 ISO Certification

HT.0104 Occupational Safety & Health

HT.0108 Procurement/Subcontracting On Job Training

HT.0112 Project Management

HT.0114 Quality Management Systems

HT.0120 Risk Management

Processes

sS1.4 Transfer Product

sS2.4 Transfer Product

sS3.6 Transfer Product

sM1.4 Package

sM2.4 Package

sM3.5 Package

Payment Processing

Working knowledge of the processes and policies required for contractual authorization of payments for sourced products and services. This includes basic financial accounting practices.

Aptitudes

HA.0014 Computer Literate
HA.0022 Detail Oriented
HA.0043 Multitasking
HA.0053 Prioritization

Experiences

HE.0002 Accounting
HE.0066 Data/Document Management
HE.0083 Enterprise Resource Planning (ERP)
HE.0220 Retail payment management

Trainings

HT.0010 Basic and Advanced Finance
HT.0028 Contract Management
HT.0056 Federal/National/International Regulatory Compliance
HT.0084 Lean Manufacturing Training
HT.0127 SCOR-S/SCOR-P Certification
HT.0139 Subcontracting Management
HT.0142 Supply Chain Management

Processes

sS2.1 Schedule Product Deliveries
sS2.5 Authorize Supplier Payment
sS3.7 Authorize Supplier Payment
sD4.6 Checkout

Physical Capability

The ability to complete a process through the use of dexterity, strength or other capacities.

Aptitudes

HA.0050 Physical ability

Experiences

HE.0105 Forklift or Other Material Handling Equipment Experience

HE.0135 Item crib management

Trainings

HT.0043 Electronic Data Exchange Systems

HT.0044 Electronic Identification Systems

Processes

sM1.2 Issue Material

sM2.2 Issue Sourced/In-Process Product

Physical Distribution Systems

The set of activities concerned with efficient movement of finished goods from the end of the production operation to the consumer.

Aptitudes

- HA.0001 Accountable
- HA.0007 Business Knowledge & Acumen (Company specific)
- HA.0010 Change Management
- HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
- HA.0028 Enabling Technology
- HA.0038 Initiative
- HA.0056 Process Orientation, Systemic and Conceptual Thinking
- HA.0065 Teamwork & Collaboration
- HA.0072 Written/Verbal Communication

Experiences

- HE.0023 Carrier selection & qualification
- HE.0138 Just-In-Time Inventory
- HE.0144 Lean Manufacturing
- HE.0157 Marketing
- HE.0169 Network Optimization
- HE.0205 Project Management
- HE.0233 SCOR
- HE.0297 Utilizing Customer Relationship Management System

Trainings

- HT.0074 Inventory Centralization
- HT.0081 Just - In - Time (JIT)
- HT.0084 Lean Manufacturing Training
- HT.0107 Physical Distribution Systems
- HT.0126 SCOR

Processes

- sEP.4 Manage Integrated Supply Chain Inventory
- sEP.7 Manage Planning Configuration
- sEP.8 Manage Plan Regulatory Requirements and Compliance
- sES.4 Manage Product Inventory
- sES.7 Manage Supplier Network
- sES.8 Manage Import/Export Requirements
- sEM.4 Manage In-Process Products (WIP)
- sEM.7 Manage Production Network
- sEM.8 Manage Make Regulatory Environment
- sED.4 Manage Finished Goods Inventory
- sED.7 Manage Product Life Cycle
- sED.8 Manage Import/Export Requirements
- sER.4 Manage Return Inventory
- sER.7 Manage Return Network Configuration
- sER.8 Manage Return Regulatory Requirements and Compliance

Picking process / order batching

The process of selecting and collecting SKUs and materials in a specified order and quantity with the objective of satisfying customers orders.

Aptitudes

HA.0014 Computer Literate
HA.0022 Detail Oriented

Experiences

HE.0066 Data/Document Management
HE.0131 Inventory Management
HE.0187 Planogram tool usage

Trainings

HT.0091 Managing Hazardous Materials
HT.0106 Packaging and palletizing
HT.0114 Quality Management Systems
HT.0132 Six Sigma Certification
HT.0155 Warehouse Management

Processes

sD4.3 Pick Product from backroom
sD4.5 Fill Shopping Cart

Planogram usage and strategies

The process of using a planogram to diagram fixtures and products to illustrate how and where retail products should be displayed, usually on a store shelf in order to increase customer purchases

Aptitudes

HA.0004 Analytical
HA.0014 Computer Literate

Experiences

HE.0131 Inventory Management
HE.0159 Master Data/Document Management
HE.0163 Modeling Techniques
HE.0204 Production Planning/Scheduling
HE.0247 Spreadsheet Management
HE.0253 Stocking plan management

Trainings

HT.0006 APICS CPIM
HT.0084 Lean Manufacturing Training
HT.0114 Quality Management Systems
HT.0127 SCOR-S/SCOR-P Certification

Processes

sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
sD4.1 Receive Product at the Store

Pricing Management

The analysis and setting of prices (on a per unit or volume basis) to meet required characteristics, business rules and/or business performance requirements.

Aptitudes

HA.0002 Accurate

Experiences

HE.0030 Company Pricing/Margin Policy

HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations

HE.0167 Negotiation

HE.0177 Order-to-cash process

Trainings

HT.0049 Enterprise Strategic Business Rules

HT.0052 ERP Systems Training

HT.0098 MRP Systems training

Processes

sD1.1 Process Inquiry and Quote

sD1.2 Receive, Enter, and Validate Order

sD2.1 Process Inquiry and Quote

sD2.2 Receive, Configure, Enter and Validate Order

Prioritization

The knowledge and ability to arrange Source process steps, jobs or orders in queue, or product receipts in the proper sequence in order to meet product/service production and deliveries as scheduled.

Aptitudes

HA.0011 Collaborative
HA.0038 Initiative

Experiences

HE.0017 Business Rules/Regulatory Policy/Company Return Policy
HE.0190 Point of Use Storage

Trainings

HT.0028 Contract Management
HT.0041 Disposition Resolution
HT.0114 Quality Management Systems

Processes

sS1.1 Schedule Product Deliveries
sS2.1 Schedule Product Deliveries
sS3.3 Schedule Product Deliveries
sES.1 Manage Sourcing Business Rules
sEM.1 Manage Production Rules
sED.1 Manage Deliver Business Rules
sER.1 Manage Business Rules for Return Processes

Procurement

Working knowledge of the process for acquiring goods and/or services at the best possible total cost of ownership, in the right quantity, quality, at the right time and in the right place, with all required documentation. This may include simple repetitive Make-to-Stock purchases or more complex Make-to-Order or Engineer-to-Order products.

Aptitudes

HA.0011 Collaborative
 HA.0014 Computer Literate
 HA.0046 Numeracy
 HA.0059 Rules Driven

Experiences

HE.0011 Basic Procurement
 HE.0017 Business Rules/Regulatory Policy/Company Return Policy
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0087 Establishing Commercial Requirements
 HE.0088 Establishing Effective SOW, Specifications, and Evaluation Criteria
 HE.0092 Establishing Source and Evaluation Criteria
 HE.0100 Financial Accounting
 HE.0109 Funnel update/ management
 HE.0210 Quotation/CRM tool
 HE.0275 Technical Data Understanding

Trainings

HT.0006 APICS CPIM
 HT.0015 Blanket Purchase Agreements
 HT.0017 Business model and sales channel
 HT.0026 Company Policies, Mission and Strategy, Business Conduct
 HT.0028 Contract Management
 HT.0037 CSCMP
 HT.0049 Enterprise Strategic Business Rules
 HT.0063 General Accounting
 HT.0079 ISM CPSM
 HT.0084 Lean Manufacturing Training
 HT.0102 Negotiation Skills
 HT.0109 Product Specific Training
 HT.0127 SCOR-S/SCOR-P Certification
 HT.0132 Six Sigma Certification
 HT.0142 Supply Chain Management
 HT.0145 Supply Chain Security
 HT.0153 Transportation/Logistics

Processes

- sS1.1 Schedule Product Deliveries
- sS2.1 Schedule Product Deliveries
- sS3.1 Identify Sources of Supply
- sS3.2 Select Final Supplier and Negotiate
- sS3.3 Schedule Product Deliveries
- sD1.1 Process Inquiry and Quote
- sD2.1 Process Inquiry and Quote
- sD3.1 Obtain and Respond to RFP/RFQ

Product and Configuration Validation

The analysis of stated product and configuration specifications against required and feasible product's performance, functional, and physical requirements.

Aptitudes

None Identified

Experiences

HE.0030 Company Pricing/Margin Policy

HE.0033 Configuration Management

HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations

Trainings

HT.0026 Company Policies, Mission and Strategy, Business Conduct

HT.0116 Regulatory Compliance

Processes

sD1.2 Receive, Enter, and Validate Order

sD2.2 Receive, Configure, Enter and Validate Order

Product checkout process

The process of removing a product from inventory and exchanging funds for the value of the product in a retail supply chain

Aptitudes

HA.0014 Computer Literate
HA.0022 Detail Oriented

Experiences

HE.0057 Customer Relationship Management (CRM)
HE.0066 Data/Document Management
HE.0131 Inventory Management
HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations

Trainings

HT.0102 Negotiation Skills
HT.0109 Product Specific Training
HT.0116 Regulatory Compliance

Processes

sD4.6 Checkout

Product Development (PDR, CDR)

Familiarity and awareness of the Product Development process and its key steps and the interaction with the Source activity. Where Product Development activities fall to suppliers ensure a seamless process with the product development specialists whilst managing commercial and logistical demands and expectations. Ensure that risk and reward are controlled throughout the process with suppliers.

Aptitudes

None Identified

Experiences

HE.0274 Technical Collaboration

Trainings

HT.0052 ERP Systems Training

Processes

sS3.1 Identify Sources of Supply

Product Information Management (Product Data Management)

The use of software or other tools to capture and maintain information on products and/or services through their life cycle.

Aptitudes

HA.0014 Computer Literate

Experiences

HE.0033 Configuration Management

HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations

HE.0188 PLM/PDM knowledge

Trainings

HT.0109 Product Specific Training

Processes

sD1.1 Process Inquiry and Quote

sD2.1 Process Inquiry and Quote

Production

The process of using machines, tools, materials and labor to make things for use or sale.

Aptitudes

HA.0050 Physical ability

Experiences

HE.0122 Industry Specific Knowledge and Experience

Trainings

HT.0102 Negotiation Skills

HT.0116 Regulatory Compliance

Processes

sM1.3 Produce and Test

sM2.1 Schedule Production Activities

sM2.3 Produce and Test

sM3.4 Produce and Test

Production Planning

Actions, tasks and responsibilities concerned with the planning, scheduling and releasing of production orders in order to satisfy demand while optimizing the available and planned resources/capacity.

Aptitudes

HA.0072 Written/Verbal Communication

Experiences

HE.0176 Order Processing System/Enterprise Resource Planning Systems Usage (ERP)System

Trainings

HT.0020 Capability & Organization Risks

Processes

sES.1 Manage Sourcing Business Rules

sEM.1 Manage Production Rules

sSR3.1 Identify Excess Product Condition

Production Planning Capacity Utilization

The process of determining the production capacity, maximum amount of work that an organization is capable of completing in a given period of time, needed by an organization to meet changing demands for its products.

Aptitudes

HA.0004 Analytical
 HA.0014 Computer Literate
 HA.0015 Conflict Resolution Skills
 HA.0030 Facilitation ability
 HA.0039 Leadership
 HA.0052 Presentor
 HA.0065 Teamwork & Collaboration
 HA.0072 Written/Verbal Communication

Experiences

HE.0059 Customer Service Strategy Agreements
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0085 EOQ management
 HE.0159 Master Data/Document Management
 HE.0160 Material Resource Planning (MRP)
 HE.0162 Materials portfolio and specifications
 HE.0163 Modeling Techniques
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0167 Negotiation
 HE.0204 Production Planning/Scheduling
 HE.0209 Quality processes related to inventory management (test times, shelf life)
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0247 Spreadsheet Management
 HE.0251 Statistical Modeling/Analysis
 HE.0263 Supplier production and lead time capabilities
 HE.0265 Supplier Service Strategy Agreements

Trainings

HT.0006 APICS CPIM
 HT.0017 Business model and sales channel
 HT.0026 Company Policies, Mission and Strategy, Business Conduct
 HT.0037 CSCMP
 HT.0042 Distribution and warehousing policies
 HT.0052 ERP Systems Training
 HT.0061 Fork Truck Licensing
 HT.0084 Lean Manufacturing Training
 HT.0102 Negotiation Skills
 HT.0109 Product Specific Training
 HT.0116 Regulatory Compliance
 HT.0118 Return Scheduling
 HT.0119 Reverse Logistics

Trainings continued...

- HT.0121 Routing and rating
- HT.0127 SCOR-S/SCOR-P Certification
- HT.0132 Six Sigma Certification
- HT.0145 Supply Chain Security
- HT.0156 Warranty Policy Training

Processes

- 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

Production Scheduling

The process of efficiently managing the assets to minimize the production time and costs, by instructing a production facility what to make, when, with which staff, and on which equipment.

Aptitudes

HA.0004 Analytical

Experiences

HE.0034 Conflict Resolution
 HE.0044 Cost Management
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0119 Industrial engineering
 HE.0131 Inventory Management
 HE.0160 Material Resource Planning (MRP)
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0208 Quality Management Systems
 HE.0225 Root cause analysis
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0311 Written/Verbal Communication

Trainings

HT.0006 APICS CPIM
 HT.0017 Business model and sales channel
 HT.0026 Company Policies, Mission and Strategy, Business Conduct
 HT.0037 CSCMP
 HT.0046 Engineering
 HT.0052 ERP Systems Training
 HT.0071 Industry Specific Test Stand Certification
 HT.0084 Lean Manufacturing Training
 HT.0089 Logistics Management
 HT.0095 Mechanic Certification
 HT.0102 Negotiation Skills
 HT.0109 Product Specific Training
 HT.0116 Regulatory Compliance
 HT.0119 Reverse Logistics
 HT.0132 Six Sigma Certification
 HT.0145 Supply Chain Security

Processes

sS1.1 Schedule Product Deliveries
 sS2.1 Schedule Product Deliveries
 sS3.3 Schedule Product Deliveries
 sM1.1 Schedule Production Activities
 sM2.1 Schedule Production Activities

Progress & performance reporting

The definition, implementation, and usage of metrics designed to track and improve process performance

Aptitudes

HA.0031 Feedback Acceptance
HA.0072 Written/Verbal Communication

Experiences

HE.0065 Data Collection/Input
HE.0305 Warehouse/Distribution Management

Trainings

HT.0006 APICS CPIM
HT.0017 Business model and sales channel
HT.0026 Company Policies, Mission and Strategy, Business Conduct
HT.0037 CSCMP
HT.0052 ERP Systems Training
HT.0102 Negotiation Skills
HT.0109 Product Specific Training
HT.0116 Regulatory Compliance
HT.0119 Reverse Logistics
HT.0127 SCOR-S/SCOR-P Certification
HT.0145 Supply Chain Security
HT.0156 Warranty Policy Training

Processes

sD1.8 Receive Product from Source or Make
sD1.9 Pick Product
sD1.10 Pack Product
sD2.8 Receive Product from Source or Make
sD2.9 Pick Product
sD2.10 Pack Product
sD3.8 Receive Product from Source or Make
sD3.9 Pick Product
sD3.10 Pack Product

Project Management

The discipline of planning, organizing, and managing resources to bring about the successful completion of specific project goals and objectives.

Aptitudes

HA.0001 Accountable
 HA.0002 Accurate
 HA.0019 Customer Oriented
 HA.0039 Leadership
 HA.0053 Prioritization
 HA.0057 Reliable
 HA.0065 Teamwork & Collaboration
 HA.0068 Time Management
 HA.0072 Written/Verbal Communication

Experiences

HE.0008 ATP logic/calculation
 HE.0060 Customer Site Readiness Verification
 HE.0090 Establishing Product Life Cycle
 HE.0219 Resource and Installation Material Organization
 HE.0274 Technical Collaboration
 HE.0310 WIP Reporting

Trainings

HT.0006 APICS CPIM
 HT.0017 Business model and sales channel
 HT.0026 Company Policies, Mission and Strategy, Business Conduct
 HT.0037 CSCMP
 HT.0040 Disposal procedure and environmental rules
 HT.0052 ERP Systems Training
 HT.0076 Inventory Management
 HT.0089 Logistics Management
 HT.0091 Managing Hazardous Materials
 HT.0109 Product Specific Training
 HT.0114 Quality Management Systems
 HT.0116 Regulatory Compliance
 HT.0119 Reverse Logistics
 HT.0127 SCOR-S/SCOR-P Certification
 HT.0145 Supply Chain Security

Processes

sS3.1 Identify Sources of Supply
 sD1.14 Install Product
 sD2.14 Install Product
 sD3.3 Enter Order, Commit Resources & Launch Program
 sD3.14 Install Product

Property Control and Disposition

Working knowledge of policies, procedures and processes required for the purchase, receipt, transport, usage and safeguarding of all company assets, including inventory and other sourced products. This includes regulatory requirements for proper disposal or excess.

Aptitudes

HA.0042 Methodic

Experiences

HE.0002 Accounting

HE.0084 Environmental, Health and Safety Systems

HE.0227 Safety Requirements

Trainings

HT.0026 Company Policies, Mission and Strategy, Business Conduct

HT.0088 Load building and Planning

HT.0102 Negotiation Skills

HT.0109 Product Specific Training

HT.0116 Regulatory Compliance

HT.0121 Routing and rating

HT.0145 Supply Chain Security

Processes

sS1.2 Receive Product

sS1.3 Verify Product

sS1.4 Transfer Product

sS2.2 Receive Product

sS2.4 Transfer Product

sS3.4 Receive Product

sS3.5 Verify Product

sS3.6 Transfer Product

Push Systems

Manufacturing system in which production is based on a projected production plan and where information flows from management to the market, the same direction in which the materials flow

Aptitudes

None Identified

Experiences

None Identified

Trainings

None Identified

Processes

sEP.7 Manage Planning Configuration
sES.1 Manage Sourcing Business Rules
sES.7 Manage Supplier Network
sEM.1 Manage Production Rules
sEM.7 Manage Production Network
sED.7 Manage Product Life Cycle
sER.7 Manage Return Network Configuration

Quality Management

The organizational structure, procedures, processes and resources needed to implement quality management.

Aptitudes

HA.0004 Analytical
HA.0007 Business Knowledge & Acumen (Company specific)
HA.0009 Business Performance Management
HA.0014 Computer Literate
HA.0022 Detail Oriented
HA.0043 Multitasking
HA.0047 Organized
HA.0053 Prioritization
HA.0054 Problem Solving
HA.0059 Rules Driven
HA.0065 Teamwork & Collaboration
HA.0068 Time Management

Experiences

HE.0017 Business Rules/Regulatory Policy/Company Return Policy
HE.0045 Cost Reduction Efforts
HE.0076 Economic Repair Assessment
HE.0091 Establishing Quality Requirements
HE.0144 Lean Manufacturing
HE.0153 Managing and Measuring Performance
HE.0172 Operations
HE.0201 Product Structure
HE.0208 Quality Management Systems
HE.0212 Receiving and Verifying Product
HE.0221 Return Process
HE.0231 Sampling methods
HE.0244 Six Sigma
HE.0252 Statistical Principles

Trainings

HT.0020 Capability & Organization Risks
HT.0021 Capacity Management (Aggregate Planning)
HT.0053 Evaluating Performance of Production Operations
HT.0054 Evaluating Quality Management Process
HT.0114 Quality Management Systems
HT.0149 Techniques of Detailed Capacity Planning Process
HT.0150 Total Quality Management (TQM)

Processes

sEP.2 Manage Performance of Supply Chain
sEP.7 Manage Planning Configuration
sS1.3 Verify Product
sS1.4 Transfer Product
sS2.1 Schedule Product Deliveries
sS2.3 Verify Product
sS2.4 Transfer Product
sS2.5 Authorize Supplier Payment
sS3.1 Identify Sources of Supply
sS3.3 Schedule Product Deliveries
sS3.5 Verify Product
sS3.6 Transfer Product
sS3.7 Authorize Supplier Payment
sES.2 Assess Supplier Performance
sES.7 Manage Supplier Network
sM1.6 Release Product to Deliver
sM2.6 Release Finished Product to Deliver
sM3.7 Release Product to Deliver
sEM.2 Manage Production Performance
sEM.7 Manage Production Network
sD1.13 Receive and verify Product by Customer
sD2.13 Receive and verify Product by Customer
sD3.13 Receive and verify Product by Customer
sD4.2 Receive Product at Store
sED.2 Assess Delivery Performance
sED.7 Manage Product Life Cycle
sSR2.1 Identify MRO Product Condition
sDR2.3 Receive MRO Product
sER.2 Manage Performance of Return Processes
sER.7 Manage Return Network Configuration

Receiving

The process of systemically and physically moving materials from an in-bound supply source to a short or long-term intermediate storage location.

Aptitudes

HA.0002 Accurate
HA.0014 Computer Literate
HA.0022 Detail Oriented

Experiences

HE.0017 Business Rules/Regulatory Policy/Company Return Policy
HE.0066 Data/Document Management
HE.0131 Inventory Management
HE.0187 Planogram tool usage
HE.0216 Regulatory Policies/Compliance

Trainings

None Identified

Processes

sD4.2 Receive Product at Store
sDR2.3 Receive MRO Product

Regulatory Policy Management

Actions, tasks and responsibilities concerned with a set of quality/legal/administrative/internal rules and standards to be complied with

Aptitudes

HA.0002 Accurate
HA.0057 Reliable

Experiences

HE.0216 Regulatory Policies/Compliance

Trainings

None Identified

Processes

sSR1.1 Identify Defective Product Condition

Requirements acceptance criteria

Ability to understand, interpret and effectively communicate to contractors, suppliers, or vendors product specifications and/or technical data which clearly delineates specific requirements regarding product acceptance.

Aptitudes

None Identified

Experiences

HE.0208 Quality Management Systems

Trainings

None Identified

Processes

sS1.3 Verify Product

sS2.3 Verify Product

sS3.5 Verify Product

Requirements allocation

Manage the allocation of defined specifications to materials and services being procured. Defined specifications will be straightforward. Generic specifications will require a level of understanding and liaison if need be with Technical personnel.

Aptitudes

HA.0067 Thinking & Problem Solving

Experiences

HE.0012 Bills of Material/Specs/Fabrication Methodology

Trainings

None Identified

Processes

sS1.3 Verify Product

sS3.5 Verify Product

Requirements change control & change notification

Manage a system that ensures up to date specifications are available when required and that an audit trail back to suppliers and internal Quality exists.

Aptitudes

HA.0072 Written/Verbal Communication

Experiences

HE.0027 Change management system

Trainings

None Identified

Processes

sS1.3 Verify Product

sS3.5 Verify Product

Requirements criteria, verification methods & tools

Ability to manage all aspects of Requirements Criteria, Verification Methods and Tools. Requirements criteria is a statement of needs, rules, standards or tests that must be used in evaluating a decision, idea, opportunity, programme, project etc. to form a correct judgement regarding the intended goal.

Aptitudes

HA.0042 Methodic

Experiences

HE.0183 Performance Reporting Systems Development/Use

HE.0208 Quality Management Systems

HE.0218 Requirements verification methods & tools

Trainings

None Identified

Processes

sS1.3 Verify Product The process and actions required determining product... 10.0

sS2.3 Verify Product The process and actions required determining product... 10.0

sS3.5 Verify Product

Requirements defect notification

To understand the importance of Requirements Defect Notification and to manage a system to monitor, analyse, highlight, and then notify for action, defects arising. Trend and pattern analysis is important as well as the correct flow of information to, and relationships with, suppliers.

Aptitudes

HA.0072 Written/Verbal Communication

Experiences

HE.0208 Quality Management Systems

Trainings

None Identified

Processes

sS1.3 Verify Product

sS3.5 Verify Product

Requirements justification / rationale

Ability to assemble and then present internally and externally the Requirements Justification/Rationale required for your organisation concerning for example the quality requirements for a vital component/material supplied by a third party. Effective justifications/rationale will be linked to internal as well as external requirements and fulfil short, medium and longer term needs.

Aptitudes

HA.0019 Customer Oriented

Experiences

HE.0208 Quality Management Systems

Trainings

None Identified

Processes

sS1.3 Verify Product
sS2.3 Verify Product
sS3.5 Verify Product

Requirements syntax, attributes, & baselines

Ability to demonstrate familiarity in the use of Requirements Syntax, Attributes & Baselines. For example attributes to be considered would include:- feasible, traceable one level higher, complete, testable, unambiguous etc.

Aptitudes

None Identified

Experiences

HE.0279 Technical writing of requirements deliverables

Trainings

None Identified

Processes

sS1.3 Verify Product

sS2.3 Verify Product

sS3.5 Verify Product

Return Management

Ability to execute the process of identifying and handling products or material which require return or disposal, regardless if it is a return for warranty repairs, damaged or defective goods (including expired shelf life), or maintenance, repair and overhaul (MRO). This process requires to be executed with strict compliance with all contractual terms and conditions, regulatory, and environmental (and green) restrictions.

Aptitudes

HA.0035 Good Judgment Execution

Experiences

HE.0146 Legal Impact

HE.0221 Return Process

HE.0257 Supplier & shipping agreements

Trainings

None Identified

Processes

sS1.2 Receive Product

sS1.3 Verify Product

sS1.4 Transfer Product

sS2.2 Receive Product

sS2.4 Transfer Product

sS3.4 Receive Product

sS3.5 Verify Product

sS3.6 Transfer Product

Return Plan Aggregation

The process of developing, analyzing, and maintaining an organizational return plan.

Aptitudes

HA.0014 Computer Literate

Experiences

HE.0083 Enterprise Resource Planning (ERP)

HE.0159 Master Data/Document Management

HE.0165 MS Office (Excel, Powerpoint, Word, Access)

HE.0247 Spreadsheet Management

HE.0293 Transportation/Warehouse Management systems (TMS/WMS)

Trainings

None Identified

Processes

sP5.4 Establish and Communicate Return Plans

Returns strategy development

A system for managing the returns of faulty products.

Aptitudes

HA.0004 Analytical
 HA.0014 Computer Literate
 HA.0030 Facilitation ability
 HA.0039 Leadership
 HA.0067 Thinking & Problem Solving

Experiences

HE.0001 ABC Accounting
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0104 Forecasting
 HE.0152 Management of service Strategy agreements with customers
 HE.0159 Master Data/Document Management
 HE.0163 Modeling Techniques
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0247 Spreadsheet Management
 HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times
 HE.0293 Transportation/Warehouse Management systems (TMS/WMS)

Trainings

None Identified

Processes

sP5.3 Balance Return Resources with Return Requirements

Reverse Logistics

End-to-end activities, responsibilities and tasks to accept, operationally process and successfully close the returns of products/materials because of unwanted product, defect, repair, refurbishing, recycling.

Aptitudes

HA.0002 Accurate
HA.0072 Written/Verbal Communication

Experiences

HE.0002 Accounting
HE.0076 Economic Repair Assessment
HE.0221 Return Process
HE.0264 Supplier Relationship Management (SRM)
HE.0268 Supply Chain Management
HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings

None Identified

Processes

sSR2.2 Disposition MRO Product
sSR2.3 Request MRO Return Authorization
sSR2.4 Schedule MRO Shipment
sSR2.5 Return MRO Product
sDR2.1 Authorize MRO Product Return

RFP/RFQ Management

The process by which specification and pricing proposals are evaluated, rated and accepted/rejected based upon criteria and objectives of the overall sourcing process.

Aptitudes

HA.0002 Accurate
 HA.0008 Business minded
 HA.0014 Computer Literate
 HA.0019 Customer Oriented
 HA.0026 Diversity Recognition/Respect
 HA.0072 Written/Verbal Communication

Experiences

HE.0008 ATP logic/calculation
 HE.0014 Business model and sales channel
 HE.0030 Company Pricing/Margin Policy
 HE.0031 Company terms and conditions
 HE.0033 Configuration Management
 HE.0053 CRM Methods and Tools
 HE.0081 Engineering/Design Management
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
 HE.0167 Negotiation
 HE.0177 Order-to-cash process
 HE.0188 PLM/PDM knowledge

Trainings

None Identified

Processes

sD3.1 Obtain and Respond to RFP/RFQ

Risk and exception management

The identification, assessment, and prioritization of risks and exceptions followed by coordinated and economical application of resources to minimize, monitor, and control the probability and/or impact of unfortunate events

Aptitudes

HA.0001 Accountable
HA.0004 Analytical
HA.0009 Business Performance Management
HA.0014 Computer Literate
HA.0028 Enabling Technology
HA.0030 Facilitation ability
HA.0038 Initiative
HA.0039 Leadership
HA.0052 Presentor
HA.0062 Strategic Leadership & Ensuring Business Alignment
HA.0072 Written/Verbal Communication

Experiences

HE.0083 Enterprise Resource Planning (ERP)
HE.0120 Industry Analysis of Supply Markets
HE.0159 Master Data/Document Management
HE.0162 Materials portfolio and specifications
HE.0167 Negotiation
HE.0204 Production Planning/Scheduling
HE.0209 Quality processes related to inventory management (test times, shelf life) 10.0
HE.0230 Sales and Operations Planning (S&OP)
HE.0247 Spreadsheet Management
HE.0263 Supplier production and lead time capabilities
HE.0265 Supplier Service Strategy Agreements
HE.0269 Supply Chain Performance Management/Metrics
HE.0270 Supply chain planning

Trainings

HT.0092 Managing Supply Risk - AMR

Processes

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
sEP.9 Manage Supply Chain Plan Risk
sES.9 Manage Supply Chain Source Risk
sEM.9 Manage Supply Chain Make Risk
sED.9 Manage Supply Chain Deliver Risk
sER.9 Manage Supply Chain Return Risk

Risk Assessment

Working knowledge and ability to identify and analyze program and critical technical process risks to increase and the likelihood of meeting or impeding both performance criteria, schedule and cost objectives, including the ability to identify process consequences and their likelihood of occurrence.

Aptitudes

HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
 HA.0032 Forward Thinking
 HA.0055 Process Improvement

Experiences

HE.0002 Accounting
 HE.0046 Cost/Benefit Analysis
 HE.0134 ISO Compliance
 HE.0222 Risk Analysis

Trainings

HT.0020 Capability & Organization Risks
 HT.0125 SCC SCRM using SCOR

Processes

sEP.9 Manage Supply Chain Plan Risk
 sS2.1 Schedule Product Deliveries
 sS3.1 Identify Sources of Supply
 sS3.2 Select Final Supplier and Negotiate
 sS3.3 Schedule Product Deliveries
 sES.9 Manage Supply Chain Source Risk
 sEM.4 Manage In-Process Products (WIP)
 sEM.6 Manage Transportation (WIP)
 sEM.9 Manage Supply Chain Make Risk
 sED.9 Manage Supply Chain Deliver Risk
 sER.9 Manage Supply Chain Return Risk

Risk Identification

Discovering, defining, describing, documenting and communicating supply chain risks before they become problems and adversely affect process

Aptitudes

- HA.0007 Business Knowledge & Acumen (Company specific)
- HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
- HA.0056 Process Orientation, Systemic and Conceptual Thinking

Experiences

- HE.0050 Creating/Reviewing/Updating Company Policies
- HE.0079 Enforcing Company Policies
- HE.0195 Procurement experience
- HE.0216 Regulatory Policies/Compliance
- HE.0222 Risk Analysis
- HE.0261 Supplier management
- HE.0268 Supply Chain Management

Trainings

- HT.0125 SCC SCRM using SCOR

Processes

- sEP.9 Manage Supply Chain Plan Risk
- sES.9 Manage Supply Chain Source Risk
- sEM.9 Manage Supply Chain Make Risk
- sED.9 Manage Supply Chain Deliver Risk
- sER.9 Manage Supply Chain Return Risk

Risk Mitigation

Systematic reduction in the extent of exposure to a risk and/or the likelihood of its occurrence.

Aptitudes

HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0205 Project Management

Trainings

HT.0125 SCC SCRM using SCOR

Processes

sEP.9 Manage Supply Chain Plan Risk
sES.9 Manage Supply Chain Source Risk
sEM.9 Manage Supply Chain Make Risk
sED.9 Manage Supply Chain Deliver Risk
sER.9 Manage Supply Chain Return Risk

Risk Response Planning

An activity that involves identifying the covered entity assets that may be subject to some risk program

Aptitudes

HA.0049 Persuasion skills

HA.0051 Political skills

Experiences

HE.0270 Supply chain planning

Trainings

HT.0125 SCC SCRM using SCOR

Processes

sEP.9 Manage Supply Chain Plan Risk

sES.9 Manage Supply Chain Source Risk

sEM.9 Manage Supply Chain Make Risk

sED.9 Manage Supply Chain Deliver Risk

sER.9 Manage Supply Chain Return Risk

Route planning

The process of selecting and scheduling carriers and determining the path which the product will take from the first to the final stop of the journey , according to order delivery requirements and geographic constraints.

Aptitudes

HA.0014 Computer Literate
HA.0054 Problem Solving
HA.0068 Time Management

Experiences

HE.0022 Carrier rating / routing guides usage
HE.0083 Enterprise Resource Planning (ERP)
HE.0112 Hazardous Materials Handling
HE.0117 Import/Export Regulations
HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0226 Routing tool usage
HE.0247 Spreadsheet Management
HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times
HE.0288 Transportation Regulations
HE.0293 Transportation/Warehouse Management systems (TMS/WMS)

Trainings

None Identified

Processes

sD1.6 Route Shipments
sD2.6 Route Shipments
sD3.6 Route Shipments

S & OP Plan Communication

The process of reviewing and communicating the output and changes in the Sales and Operations Plan.

Aptitudes

HA.0015 Conflict Resolution Skills
HA.0018 Cross Functional
HA.0034 Goal Oriented
HA.0065 Teamwork & Collaboration

Experiences

HE.0230 Sales and Operations Planning (S&OP)

Trainings

None Identified

Processes

sP1.4 Establish and Communicate Supply Chain Plans

Safety stock/replenishment calculations

The calculation of appropriate stocking levels to mitigate demand variability through the inclusion of all relevant lead times, variability during lead times, and desired service levels.

Aptitudes

HA.0004 Analytical

HA.0014 Computer Literate

Experiences

HE.0131 Inventory Management

HE.0253 Stocking plan management

Trainings

HT.0019 Calculating Safety Stock

Processes

sEP.4 Manage Integrated Supply Chain Inventory

sES.4 Manage Product Inventory

sEM.4 Manage In-Process Products (WIP)

sD4.1 Receive Product at the Store

sD4.2 Receive Product at Store

sD4.3 Pick Product from backroom

sD4.4 Stock Shelf

sED.4 Manage Finished Goods Inventory

sER.4 Manage Return Inventory

Sales and Operations Planning (S&OP)

A set of decision-making processes to balance demand and supply, to integrate financial planning and operational planning, and to link high level strategic plans with day-to-day operations necessary to achieves focus, alignment and synchronization among all functions of the organization.

Aptitudes

HA.0004 Analytical

HA.0054 Problem Solving

HA.0067 Thinking & Problem Solving

Experiences

HE.0269 Supply Chain Performance Management/Metrics

HE.0271 Supply Chain Requirements

Trainings

None Identified

Processes

sP2.3 Balance Product Resources with Product Requirements

Six Sigma

A basic understanding of statistical analysis and/or working knowledge and ability to apply of the Six Sigma business methodology for improving the quality of process outputs by identifying and removing the causes of defects (errors) and, minimizing variability in business processes.

Aptitudes

HA.0004 Analytical
 HA.0014 Computer Literate
 HA.0030 Facilitation ability
 HA.0039 Leadership

Experiences

HE.0039 Contract Administration/Management
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0118 Inbound quality management
 HE.0131 Inventory Management
 HE.0159 Master Data/Document Management
 HE.0165 MS Office (Excel, Powerpoint, Word, Access)
 HE.0230 Sales and Operations Planning (S&OP)
 HE.0247 Spreadsheet Management

Trainings

None Identified

Processes

sP5.1 Assess 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
 sEP.7 Manage Planning Configuration
 sES.7 Manage Supplier Network
 sEM.7 Manage Production Network
 sED.7 Manage Product Life Cycle
 sER.7 Manage Return Network Configuration

Solicitation Methods

Solicitation Methods involves one's ability to request and/or seek bids, proposals, quotations or, requests for information and/or business, but unlike an offer it is only an indication rather than a binding bid. In the context of Source one seeks such information prior to agreeing to, or executing contracts. Solicitation methods can take many forms including electronic but there is a skill in managing a breadth of interest to arrive at an appropriate contract commensurate with the investment needed in the process.

Aptitudes

None Identified

Experiences

HE.0011 Basic Procurement

Trainings

None Identified

Processes

sS3.1 Identify Sources of Supply

Solicitation/Competitive Bidding Process

The process of identifying the products or services required and efficiently soliciting and procuring same.

Aptitudes

None Identified

Experiences

HE.0011 Basic Procurement

Trainings

None Identified

Processes

sS1.1 Schedule Product Deliveries
sS3.1 Identify Sources of Supply
sS3.2 Select Final Supplier and Negotiate
sS3.3 Schedule Product Deliveries

Specific fabrication knowledge based on product

Personnel in Source should have sufficient knowledge of the specific fabrication route for any given product to inform and illuminate the Source activity. The mindset to be involved and inquisitive is paramount.

Aptitudes

None Identified

Experiences

HE.0012 Bills of Material/Specs/Fabrication Methodology

HE.0083 Enterprise Resource Planning (ERP)

HE.0160 Material Resource Planning (MRP)

Trainings

None Identified

Processes

sM3.1 Finalize Production Engineering

Strategic Planning

An organization's process of defining its strategy, or direction, and making decisions on allocating its resources to pursue this strategy, including its capital and people.

Aptitudes

HA.0062 Strategic Leadership & Ensuring Business Alignment
HA.0063 Strategic Thinking

Experiences

HE.0254 Strategic Planning

Trainings

HT.0031 Corporate Strategy
HT.0137 Strategic Issues
HT.0138 Strategic Planning

Processes

sEP.1 Manage Business Rules for Plan Process
sES.1 Manage Sourcing Business Rules
sEM.1 Manage Production Rules
sED.1 Manage Deliver Business Rules
sER.1 Manage Business Rules for Return Processes

Subcontracting Types (FFP, CP, CPAF, Performance Based)

The process of letting and managing contracts in accordance with federal, state and local laws and company guidelines.

Aptitudes

HA.0059 Rules Driven

Experiences

HE.0255 Subcontracting

Trainings

None Identified

Processes

sS2.1 Schedule Product Deliveries

sS3.3 Schedule Product Deliveries

Supplier Relationship Management (SRM)

The process of working collaboratively with suppliers vital to the organizational success to maximise the potential value of those relationships

Aptitudes

HA.0003 Adaptable
 HA.0004 Analytical
 HA.0011 Collaborative
 HA.0014 Computer Literate
 HA.0015 Conflict Resolution Skills
 HA.0026 Diversity Recognition/Respect
 HA.0030 Facilitation ability
 HA.0035 Good Judgment Execution
 HA.0039 Leadership
 HA.0047 Organized
 HA.0052 Presentor
 HA.0053 Prioritization
 HA.0054 Problem Solving
 HA.0059 Rules Driven
 HA.0065 Teamwork & Collaboration
 HA.0070 Validation
 HA.0071 Work Control
 HA.0072 Written/Verbal Communication

Experiences

HE.0005 Advanced Procurement
 HE.0010 Basic Finance
 HE.0011 Basic Procurement
 HE.0012 Bills of Material/Specs/Fabrication Methodology
 HE.0013 Bundling practices
 HE.0035 Consignment practices
 HE.0064 D & B Reports Review
 HE.0083 Enterprise Resource Planning (ERP)
 HE.0121 Industry specific domain knowledge
 HE.0122 Industry Specific Knowledge and Experience
 HE.0128 Internal organizational vs functional knowledge
 HE.0156 Market Knowledge
 HE.0159 Master Data/Document Management
 HE.0160 Material Resource Planning (MRP)
 HE.0162 Materials portfolio and specifications
 HE.0167 Negotiation
 HE.0170 Off-shore contracting
 HE.0185 Performance Reporting System/ERP System
 HE.0198 Product Life Cycle Management
 HE.0204 Production Planning/Scheduling
 HE.0206 Pull Systems

Experiences continued...

- HE.0206 Pull Systems
- HE.0209 Quality processes related to inventory management (test times, shelf life)
- HE.0213 Reducing Total Cost of Ownership
- HE.0222 Risk Analysis
- HE.0224 Risk Management
- HE.0230 Sales and Operations Planning (S&OP)
- HE.0246 Spend & Supply Demand Analysis
- HE.0247 Spreadsheet Management
- HE.0248 Stakeholder Management
- HE.0260 Supplier Identification, Qualification
- HE.0263 Supplier production and lead time capabilities
- HE.0265 Supplier Service Strategy Agreements
- HE.0266 Supply Chain Collaboration & Partnerships
- HE.0272 Supply Demand Segmentation
- HE.0303 Vendor Rating System

Trainings

None Identified

Processes

- 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
- sS1.1 Schedule Product Deliveries
- sS1.2 Receive Product
- sS1.4 Transfer Product
- sS1.5 Authorize Supplier Payment
- sS2.1 Schedule Product Deliveries
- sS2.2 Receive Product
- sS2.4 Transfer Product
- sS2.5 Authorize Supplier Payment
- sS3.1 Identify Sources of Supply
- sS3.2 Select Final Supplier and Negotiate
- sS3.3 Schedule Product Deliveries
- sS3.4 Receive Product
- sS3.6 Transfer Product
- sS3.7 Authorize Supplier Payment

Supply Chain Leadership

The knowledge and know-how of supply chain including the best practices and best-in-class systems needed to fulfill his or her duties.

Aptitudes

HA.0017 Courageous Leadership
HA.0021 Decision-making & Decisiveness
HA.0036 Impact and Influence
HA.0072 Written/Verbal Communication

Experiences

HE.0268 Supply Chain Management

Trainings

HT.0141 Supply Chain Leadership

Processes

sEP.1 Manage Business Rules for Plan Process

Supply Chain Management

The management of a network of interconnected businesses involved in the ultimate provision of product and service packages required by end customers

Aptitudes

HA.0009 Business Performance Management
HA.0013 Compliance Orientation
HA.0017 Courageous Leadership
HA.0021 Decision-making & Decisiveness
HA.0036 Impact and Influence
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0049 Creating and Management of Business Rules
HE.0050 Creating/Reviewing/Updating Company Policies
HE.0205 Project Management
HE.0256 Supervisory/Management
HE.0267 Supply Chain Leadership
HE.0268 Supply Chain Management
HE.0270 Supply chain planning

Trainings

HT.0072 Integrated Supply Chain Management
HT.0073 Introduction to Supply Chain
HT.0141 Supply Chain Leadership

Processes

sEP.1 Manage Business Rules for Plan Process
sEP.7 Manage Planning Configuration
sEP.9 Manage Supply Chain Plan Risk
sES.1 Manage Sourcing Business Rules
sES.7 Manage Supplier Network
sES.9 Manage Supply Chain Source Risk
sEM.1 Manage Production Rules
sEM.7 Manage Production Network
sEM.9 Manage Supply Chain Make Risk
sED.1 Manage Deliver Business Rules
sED.7 Manage Product Life Cycle
sED.9 Manage Supply Chain Deliver Risk
sER.1 Manage Business Rules for Return Processes
sER.7 Manage Return Network Configuration
sER.9 Manage Supply Chain Return Risk

Supply Chain Performance Measurements

Performance measurement and metrics used to set objectives, evaluating performance, and determine future course of action in a supply chain

Aptitudes

HA.0007 Business Knowledge & Acumen (Company specific)
HA.0009 Business Performance Management
HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
HA.0048 Performance for Results
HA.0056 Process Orientation, Systemic and Conceptual Thinking

Experiences

HE.0153 Managing and Measuring Performance
HE.0172 Operations
HE.0258 Supplier Certification

Trainings

HT.0025 Communicating Customer & Supplier Information
HT.0032 Cost Reduction Efforts
HT.0073 Introduction to Supply Chain
HT.0132 Six Sigma Certification
HT.0143 Supply Chain Performance Measurements

Processes

sEP.2 Manage Performance of Supply Chain
sES.2 Assess Supplier Performance
sEM.2 Manage Production Performance
sED.2 Assess Delivery Performance
sER.2 Manage Performance of Return Processes

Supply Chain Planning

The coordination of linked resources across all or part of a supply chain in eliminating or reducing manufacturing and logistics bottlenecks and creating optimized schedules based on shared inventory and order information.

Aptitudes

HA.0001 Accountable
HA.0007 Business Knowledge & Acumen (Company specific)
HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
HA.0028 Enabling Technology
HA.0032 Forward Thinking
HA.0033 Functional Business Knowledge & Expertise
HA.0038 Initiative
HA.0056 Process Orientation, Systemic and Conceptual Thinking
HA.0063 Strategic Thinking
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0186 Planning
HE.0205 Project Management
HE.0270 Supply chain planning

Trainings

HT.0144 Supply chain planning

Processes

sEP.1 Manage Business Rules for Plan Process
sEP.7 Manage Planning Configuration
sEP.10 Align Supply Chain Unit Plan with Financial Plan
sES.7 Manage Supplier Network
sEM.7 Manage Production Network
sED.7 Manage Product Life Cycle
sER.7 Manage Return Network Configuration

Supply Chain Security

The process of adding/enhancing the security of the supply chain. It combines traditional practices of supply chain management with the security requirements of the system, which are driven by threats such as terrorism, piracy, and theft.

Aptitudes

HA.0004 Analytical
 HA.0014 Computer Literate
 HA.0030 Facilitation ability
 HA.0039 Leadership

Experiences

HE.0083 Enterprise Resource Planning (ERP)
 HE.0094 Exception management tool usage/experience
 HE.0108 Fuel Price Hedging Strategy
 HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times

Trainings

None Identified

Processes

sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
 sP4.2 Identify, Assess and Aggregate Delivery Resources
 sP4.3 Balance Delivery Resources and Capabilities with Delivery Requirements
 sP5.1 Assess and Aggregate Return Requirements
 sP5.2 Identify, Assess and Aggregate Return Resources
 sP5.3 Balance Return Resources with Return Requirements

Supply Planning

The process of identifying, prioritizing, and aggregating, as a whole with constituent parts, all sources of supply that are required and add value in the supply chain of a product or service at the appropriate level, horizon and interval.

Aptitudes

HA.0004 Analytical
HA.0014 Computer Literate
HA.0015 Conflict Resolution Skills
HA.0018 Cross Functional
HA.0030 Facilitation ability
HA.0037 Information Management
HA.0039 Leadership
HA.0045 Negotiator
HA.0052 Presentor
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experiences

HE.0048 Cost/Service Modeling
HE.0082 Enterprise Business Process
HE.0083 Enterprise Resource Planning (ERP)
HE.0122 Industry Specific Knowledge and Experience
HE.0127 Internal market/SKU segmentation logic
HE.0159 Master Data/Document Management
HE.0160 Material Resource Planning (MRP)
HE.0163 Modeling Techniques
HE.0165 MS Office (Excel, Powerpoint, Word, Access)
HE.0167 Negotiation
HE.0198 Product Life Cycle Management
HE.0199 Product Portfolio understanding
HE.0247 Spreadsheet Management
HE.0269 Supply Chain Performance Management/Metrics

Trainings

None Identified

Processes

SP1.2 Identify, Prioritize and Aggregate Supply Chain Resources

Technical Evaluation

Many activities within the Source function require technical evaluation. Whilst expert opinion can be sought, Source personnel must have sufficient technical background to be able to look at any decision to be taken from the technical perspective. The mindset and willingness to so engage is important. This includes an understanding of technical requirements and the ability to effectively communication with other technical organizations within the enterprise as well as those providing the technical specifications.

Aptitude
None Identified
Experience
HE.0274 Technical Collaboration
Training
None Identified
Process
sS3.2 Select Final Supplier and Negotiate

Technical Manual Reading

Review of documentation containing instructions for installation, operation, use, maintenance, parts list, support, and training requirements for the effective deployment of an equipment, machine, process, or system.

Aptitude

HA.0040 Literate
HA.0041 Mechanical Ability

Experience

HE.0070 Diagram Reading

Training

None Identified

Process

sSR2.1 Identify MRO Product Condition

Test Stand Operations

A test carried out on a machine, a component, or software before it is released for use, to ensure that it works properly.

Aptitude

HA.0041 Mechanical Ability

Experience

HE.0202 Product/Supplier Knowledge

Training

None Identified

Process

sSR2.1 Identify MRO Product Condition

Total Quality Management (TQM)

Total Quality Management (or TQM) is a management concept coined by W. Edwards Demings to reduce the errors produced during the manufacturing or service process, increase customer satisfaction, streamline supply chain management, aim for modernization of equipment and ensure workers have the highest level of training.

Aptitude

HA.0001 Accountable
HA.0010 Change Management
HA.0013 Compliance Orientation
HA.0015 Conflict Resolution Skills
HA.0023 Diagnostic Information Gathering, Analysis & Problem Solving
HA.0028 Enabling Technology
HA.0029 Engagement and Motivation of Others
HA.0038 Initiative
HA.0055 Process Improvement
HA.0056 Process Orientation, Systemic and Conceptual Thinking
HA.0058 Results & Quality Orientation
HA.0065 Teamwork & Collaboration
HA.0072 Written/Verbal Communication

Experience

HE.0015 Business Performance Management
HE.0027 Change management system
HE.0057 Customer Relationship Management (CRM)
HE.0153 Managing and Measuring Performance
HE.0172 Operations
HE.0193 Process Improvement
HE.0205 Project Management
HE.0208 Quality Management Systems

Training

HT.0073 Introduction to Supply Chain
HT.0114 Quality Management Systems
HT.0126 SCOR
HT.0150 Total Quality Management (TQM)

Process

sEP.2 Manage Performance of Supply Chain
sES.2 Assess Supplier Performance
sEM.2 Manage Production Performance
sED.2 Assess Delivery Performance
sER.2 Manage Performance of Return Processes

Transport Mode Selection

The process of analyzing and selecting an appropriate transportation mode(s) in order to meet cost and service objectives

Aptitude

HA.0008 Business minded
HA.0019 Customer Oriented
HA.0026 Diversity Recognition/Respect

Experience

HE.0141 Knowledge of the company's product/services to offer best fit to the customer's requirements/packaging configurations
HE.0180 Packaging Configuration and Palletizing
HE.0184 Performance/Cost Trade-offs
HE.0284 Transportation Management - Mode Capabilities/Capacities/Lead Times

Training

HT.0006 APICS CPIM

Process

sD1.5 Build Loads
sD2.5 Build Loads
sD3.5 Build Loads

Troubleshooting

The process of using a logical, systematic search for the source of a problem so that it can be solved, and so the product or process can be made operational again.

Aptitude

None Identified

Experience

HE.0077 Electrical/ pneumatic/hydro etc.

HE.0245 Specific Systems knowledge

Training

None Identified

Process

sM3.1 Finalize Production Engineering

Vendor Managed Inventory

Working knowledge of procurement and Vendor Managed Inventory (VMI) business model whereby the individual can clearly and concisely communicate specific information to a supplier for a particular product(s) for which that supplier will take full responsibility for maintaining an agreed inventory of the product(s).

Aptitude

None Identified

Experience

HE.0068 Delivery Scheduling
HE.0131 Inventory Management

Training

HT.0025 Communicating Customer & Supplier Information
HT.0154 Vendor Managed Inventory

Process

sEP.4 Manage Integrated Supply Chain Inventory
sS2.1 Schedule Product Deliveries
sS3.3 Schedule Product Deliveries
sES.1 Manage Sourcing Business Rules
sES.4 Manage Product Inventory
sES.10 Manage Supplier Agreements

Verification Strategies

Experience of and familiarity with Verification Strategies in various aspects of the Source function is required e.g. Supplier service, quality, cost etc.

Aptitude

HA.0067 Thinking & Problem Solving

Experience

HE.0217 Requirements management system

Training

None Identified

Process

sS1.3 Verify Product

sS2.3 Verify Product

sS3.5 Verify Product

VMI planning and management

The process of using a logical, systematic search for the source of a problem so that it can be solved, and so the product or process can be made operational again.

Aptitude

HA.0004 Analytical
HA.0014 Computer Literate
HA.0030 Facilitation ability
HA.0039 Leadership

Experience

HE.0083 Enterprise Resource Planning (ERP)
HE.0131 Inventory Management
HE.0152 Management of service Strategy agreements with customers
HE.0159 Master Data/Document Management
HE.0163 Modeling Techniques
HE.0165 MS Office (Excel, Powerpoint, Word, Access)
HE.0230 Sales and Operations Planning (S&OP)
HE.0247 Spreadsheet Management

Training

None Identified

Process

sP4.1 Identify, Prioritize and Aggregate Delivery Requirements
sP4.4 Establish Delivery Plans
sP5.1 Assess and Aggregate Return Requirements

Warranty process and policy

Actions, processes, rules aiming at regulating the commitment of a party about the performance/quality features of its products and services to its customers.

Aptitude

HA.0072 Written/Verbal Communication

Experience

HE.0202 Product/Supplier Knowledge

HE.0208 Quality Management Systems

HE.0216 Regulatory Policies/Compliance

Training

None Identified

Process

sSR1.1 Identify Defective Product Condition

sSR2.2 Disposition MRO Product

sDR2.1 Authorize MRO Product Return

sDR2.3 Receive MRO Product

sSR3.1 Identify Excess Product Condition

Warranty Return and Repair

The ability to understand, coordinate and execute the Return processes for the return of products or materials covered under contractual Warranty Return and Repair terms and conditions, including proper preparation of return authorization documentation and, the coordination for any packaging/crating and transportation required. This may require coordination with other organizations within the enterprise for shipment or for on-location repair by the supplier.

Aptitude

HA.0011 Collaborative
HA.0061 Situational Awareness

Experience

HE.0039 Contract Administration/Management
HE.0041 Contractual Terms & Conditions
HE.0208 Quality Management Systems
HE.0274 Technical Collaboration

Training

None Identified

Process

sS2.1 Schedule Product Deliveries
sS2.5 Authorize Supplier Payment
sS3.1 Identify Sources of Supply
sS3.2 Select Final Supplier and Negotiate
sS3.3 Schedule Product Deliveries
sS3.7 Authorize Supplier Payment

Waste Management

The process of collecting, transporting, processing, recycling or disposing, and monitoring of waste materials in accordance with federal, state and local laws and company guidelines.

Aptitude

HA.0022 Detail Oriented
HA.0047 Organized
HA.0059 Rules Driven
HA.0060 Safe working

Experience

HE.0009 Bar Coding/RFID
HE.0012 Bills of Material/Specs/Fabrication Methodology
HE.0075 DOT/EPA
HE.0078 Electronic Data Interchange (EDI) Systems
HE.0083 Enterprise Resource Planning (ERP)
HE.0100 Financial Accounting
HE.0113 Hazardous Waste Disposal Guidelines
HE.0119 Industrial engineering
HE.0144 Lean Manufacturing
HE.0160 Material Resource Planning (MRP)
HE.0161 Materials Management
HE.0178 OSHA
HE.0244 Six Sigma
HE.0264 Supplier Relationship Management (SRM)
HE.0280 Trade Off Analysis
HE.0307 Waste Disposal Procedure
HE.0309 WIP Methodology
HE.0311 Written/Verbal Communication

Training

None Identified

Process

sM1.7 Waste Disposal
sM2.2 Issue Sourced/In-Process Product
sM2.7 Waste Disposal
sM3.8 Waste Disposal

Wave/batch picking

An order management process used in distribution centers by which the picking workload is divided for the day into a series of relatively comparable intervals. Wave data includes the workload by order or function (case picking, repack pick). Within a wave, normally orders are consolidated for enabling efficient picking by product.

Aptitude

HA.0014 Computer Literate
HA.0031 Feedback Acceptance

Experience

HE.0066 Data/Document Management
HE.0131 Inventory Management
HE.0202 Product/Supplier Knowledge
HE.0305 Warehouse/Distribution Management

Training

None Identified

Process

sD1.9 Pick Product
sD2.9 Pick Product
sD3.9 Pick Product

Section 6

Special Applications

Introduction

Sustainable business models and environmental accounting are growing business concerns. However, there are multiple approaches to measuring the total environmental footprint of an organization or supply chain with no agreed upon standards. The SCOR Model, which is a proven framework for defining supply chain scope and process operations as well as measuring supply chain performance, provides an excellent foundation for environmental accounting in the supply chain.

In that regard, the Supply Chain Council is proposing a set of strategic environmental metrics that can be added to the SCOR Model to effectively allow the SCOR Model to be used as a framework for environmental accounting. The proposed metrics are listed in the table below.

Metric	Units	Basis
Carbon Emissions	Tons CO ₂ Equivalent	This is the unit of measure currently used for green house gas emissions and is a measure of the climate impact from CO ₂ and other global warming air emissions.
Air Pollutant Emissions	Tons or kg	This would include emissions of major air pollutants (CO _x , NO _x , SO _x , Volatile Organic Compounds (VOC) and Particulate). These are the major emissions that U.S. EPA tracks.
Liquid Waste Generated	Tons or kg	This includes liquid waste that is either disposed of or released to open water or sewer systems (these emissions are generally listed on water emissions permits).
Solid Waste Generated	Tons or kg	The total solid waste generated by the process.
% Recycled waste	Per cent	The per cent of the solid waste that is recycled.

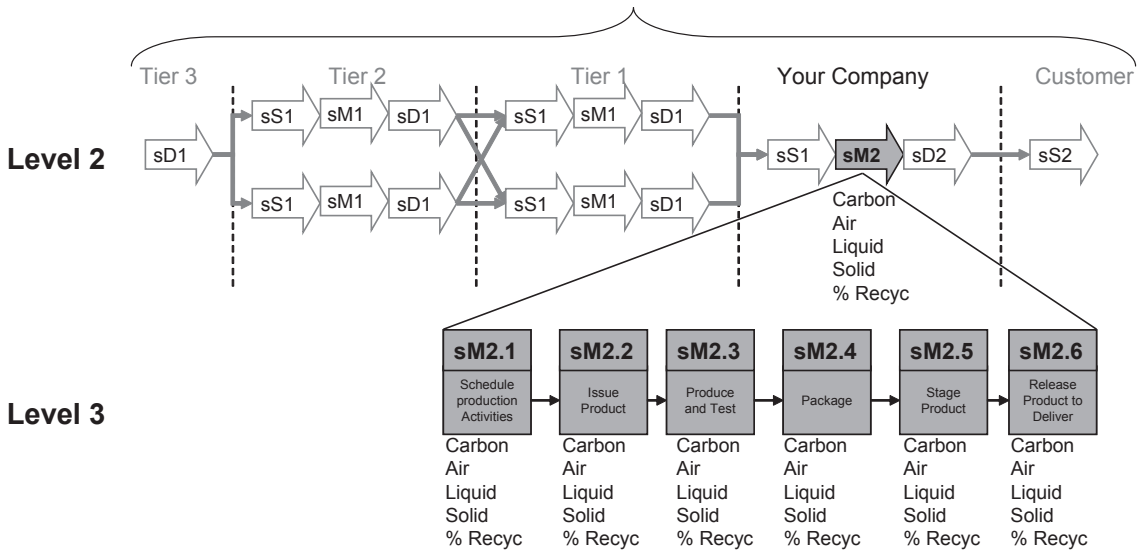
These five metrics can be measured for each of the SCOR Level 3 processes and then aggregated to create a Level 2 and Level 1 metric. These metrics are readily available for most organizations. Environmental agencies and industry associations have developed emissions factors based on process throughput, energy consumption, etc. for calculating these emissions. Alternatively emissions values can be directly collected through monitoring programs or common documents (e.g., regulatory reports, waste shipping documents, environmental permits, etc.).

By adding these metrics to the SCOR Model, an organization can use the existing SCOR based methods for defining supply chain scope and configuration. Once that process is complete, these metrics allow for targeted, structured data collection and calculation of metrics which ultimately provide a total view of supply chain environmental performance. The figure below illustrates the aggregation of these metrics along the SCOR process structure.

GreenSCOR

Level 1

Total Carbon Footprint
 $\text{Air} + \text{Liquid} + \text{Solid} - \% \text{ Recyc} = \text{Total Environmental Footprint}$



Using the SCOR Model as an environmental accounting framework has additional benefits as well. First, the framework clearly ties the various emissions to the originating processes. This provides a structure for not just measuring performance, but identifying where action can be taking to improve performance.

Second, the hierarchal nature of the SCOR Model allows for strategic environmental footprint goals to be easily translated to targets in specific activities. Likewise, when strategic goals are not being met, the framework provides a structure for root cause analysis as well as end-to-end supply chain optimization around environmental performance.

Lastly, as with other SCOR Model metrics, these metrics have clear definitions and a tie to process activities that provide a foundation for effective benchmarking. This capability allows companies to compare environmental performance of their supply chain using the same methods currently used for comparing business performance. Through benchmarking, managers can go beyond measuring environmental performance and understand that performance in the context of their industry peers' performance.

The remainder of this appendix details these environmental metrics and their decomposition levels in the same format used elsewhere in the SCOR Model.

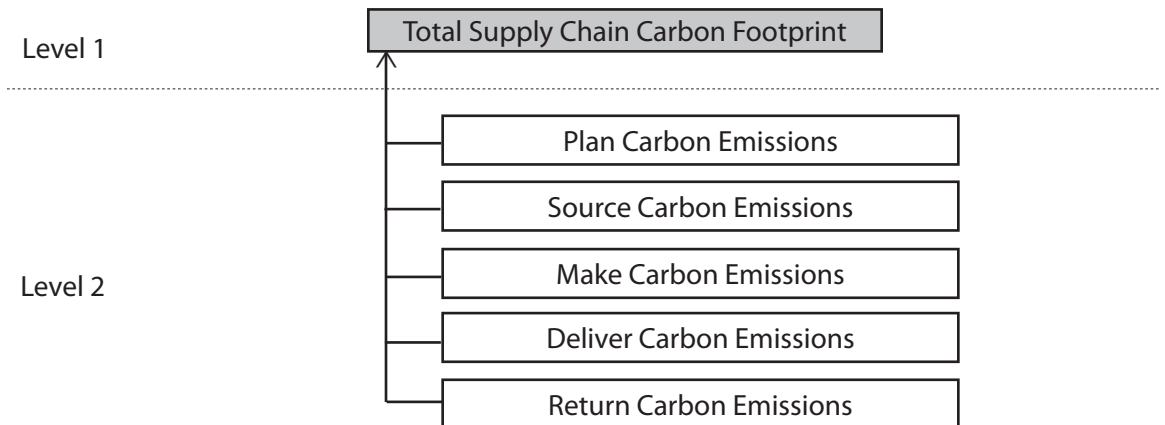
The Supply Chain Council believes that this metrics structure provides an effective tool for environmental supply chain accounting. However, this approach is not currently in use, and, therefore, these metrics are not included as fully approved SCOR metrics. Please provide feedback to the Supply Chain Council on the effectiveness of this metrics structure as it is applied to your supply chain operations.

Performance Attribute: Supply Chain Costs

Total Supply Chain Carbon Footprint

The sum of the carbon equivalent emissions associated with the SCOR Level 2 processes to Plan, Source, Make, Deliver, and Return.

Hierarchical Metric Structure



Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Total Supply Chain Carbon Footprint = Plan Carbon Emissions + Source + Make + Deliver + Return

Calculation

Total Supply Chain Carbon Footprint = sum of emissions from energy and fuel consumption and process related emissions

Data Collection

Carbon emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on energy consumption, fuel type and consumption, or process throughput. Alternatively, actual emissions can be monitored from discrete sources .

Discussion

Often, a supply chain represents partial use of a facility, production line, vehicle, etc. Therefore, the carbon emissions from this infrastructure must be apportioned based on the proportional use of the supply chain.

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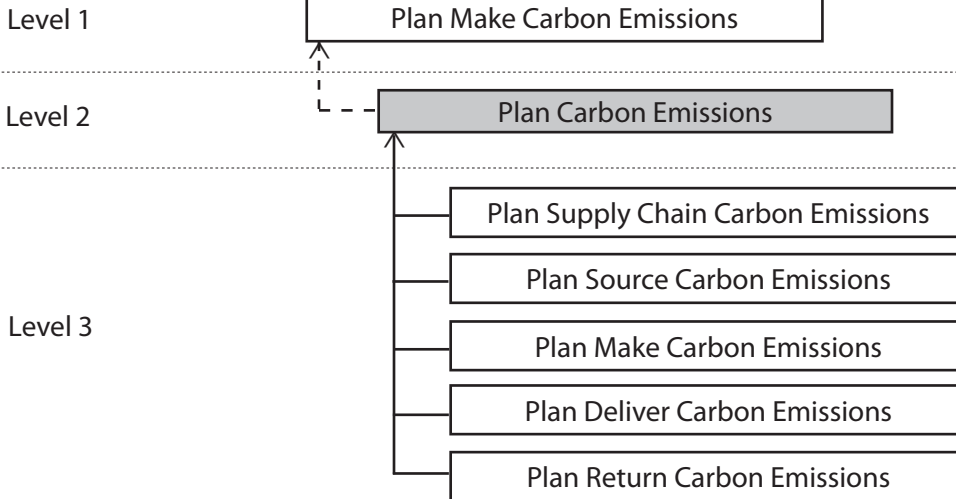
Performance Attribute: Supply Chain Costs

Plan Carbon Emissions

Process Number: sP1, sP2, sP3, sP4, sP5

The sum of carbon emissions associated with Plan.

Hierarchical Metric Structure



Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Plan Carbon Emissions = Sum of Plan Carbon Emissions (Plan + Source + Make + Deliver + Return)

Calculation

Plan carbon emissions can be calculated using published emission factors. In most organizations, the Carbon emissions from the planning process will consist exclusively of energy consumed to support planning tools and infrastructure, including facilities.

Data Collection

Carbon emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on energy consumption, fuel type and consumption, or process throughput. Alternatively, actual emissions can be monitored from discrete sources.

Discussion

Often, energy consumption will have to be allocated to various processes based on factors such as square footage, unit volume, revenue, or other factors.

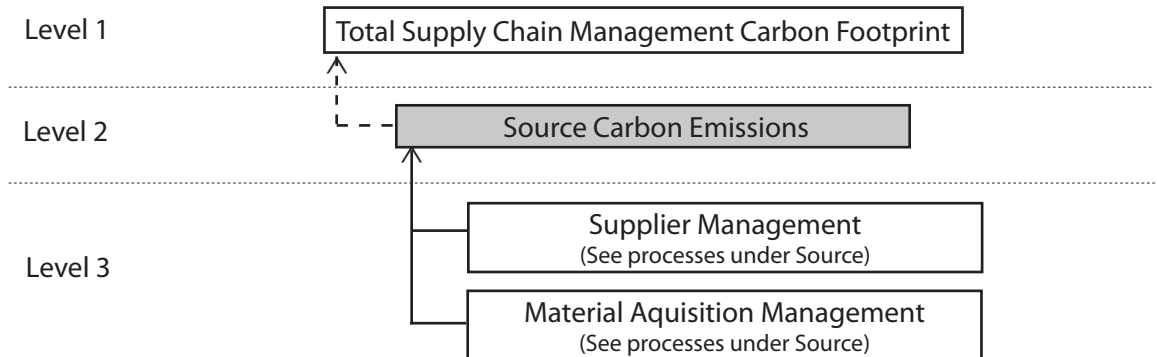
Performance Attribute: Supply Chain Costs

Source Carbon Emissions

Process Number: sS1, sS2, sS3

The sum of the carbon emissions associated with Source.

Hierarchical Metric Structure



Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Source Carbon Emissions = Sum of Carbon Emissions for (Supplier Management + Material Acquisition Management)

Calculation

- Supplier Management = material planning + planning procurement staff + supplier negotiation and qualification + etc.
- Material Acquisition Management = bidding and quotations + ordering + receiving + incoming material inspection + material storage + payment authorization + sourcing business rules and rqmts. + inbound freight and duties + etc.

Data Collection

Carbon emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on energy consumption, fuel type and consumption, or process throughput. Alternatively, actual emissions can be monitored from discrete sources .

Discussion

Often, energy consumption will have to be allocated to various processes based on factors such as square footage, unit volume, revenue, or other factors.

GreenSCOR

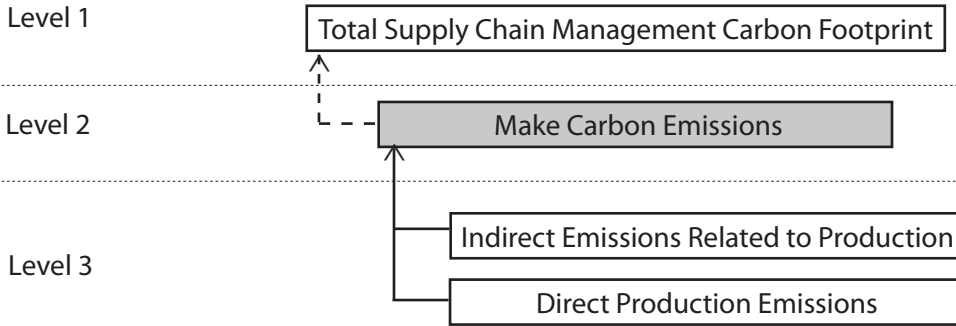
Performance Attribute: Supply Chain Costs

Make Carbon Emissions

Process Number: sM1, sM2, sM3

The sum of the carbon emissions associated with Make.

Hierarchical Metric Structure



Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Make Carbon Emissions = Sum of Direct Labor, and Direct non-Material Product-related Cost (equipment) and of Indirect Product-related Cost

Calculation

None Identified

Data Collection

Carbon emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on energy consumption, fuel type and consumption, or process throughput. Alternatively, actual emissions can be monitored from discrete sources .

Discussion

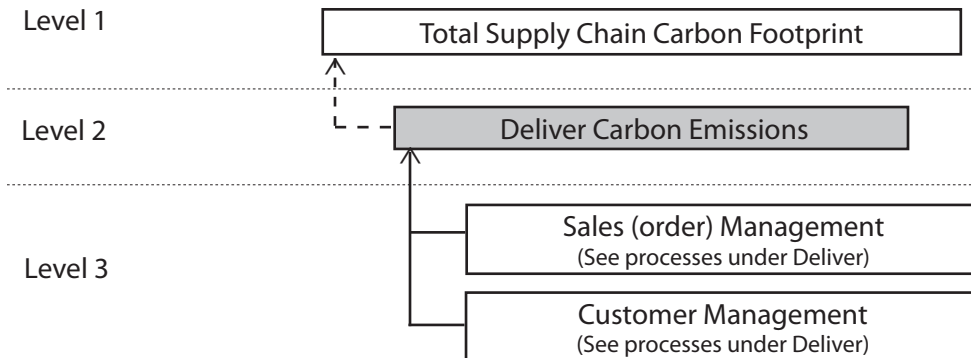
Often, energy consumption will have to be allocated to various processes based on factors such as square footage, unit volume, revenue, or other factors.

Performance Attribute: Supply Chain Costs

Deliver Carbon Emissions

Process Number: sD1, sD2, sD3

The sum of the carbon emissions associated with Deliver and/or Install

Hierarchical Metric Structure**Qualitative Relationship Description**

None Identified

Quantitative Relationship (optional, if calculable)

Deliver Carbon Emissions = Sum of Carbon Emissions of (Sales order management + Customer Management)

Calculation

- Sales order management = inquiry & quotations + order entry & maintenance + channel management + order fulfillment + distribution + transportation + outbound freight and duties + installation + customer invoicing / accounting + new product release / phase-in + etc.
- Customer Management = financing + post-sales customer service + handling disputes + field repairs + enabling technologies + etc.

Data Collection

Carbon emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on energy consumption, fuel type and consumption, or process throughput. Alternatively, actual emissions can be monitored from discrete sources .

Discussion

Often, energy consumption will have to be allocated to various processes based on factors such as square footage, unit volume, revenue, or other factors.

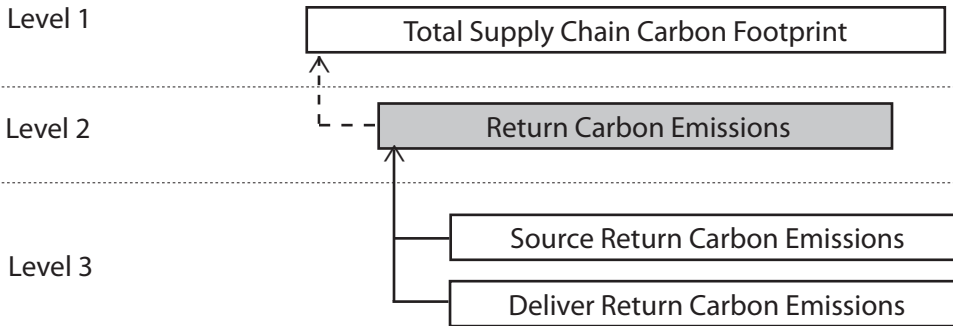
Performance Attribute: Supply Chain Costs

Return Carbon Emissions

Process Number: sSRx, sDRx

The sum of the carbon emissions resulting from returning a product to the supplier.

Hierarchical Metric Structure



Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Cost to Return = Sum of Cost to Return (to Sources + from Customers)

Calculation

- Cost to Return to Source (sSRx) = Verify Defective Product Emissions + Disposition of Defective Product Emissions + Identify MRO Condition Emissions + Request MRO Return Authorization Emissions + Schedule MRO Shipment Emissions + Return MRO Product Emissions + etc.
- Cost to Return From Customer (sDRx) = Authorization Emissions + Schedule Return Emissions + Receive Emissions + Authorize MRO Return Emissions + Schedule MRO Return Emissions + Receive MRO Return Emissions + Transfer MRO Product Emissions + etc.

Data Collection

Carbon emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on energy consumption, fuel type and consumption, or process throughput. Alternatively, actual emissions can be monitored from discrete sources .

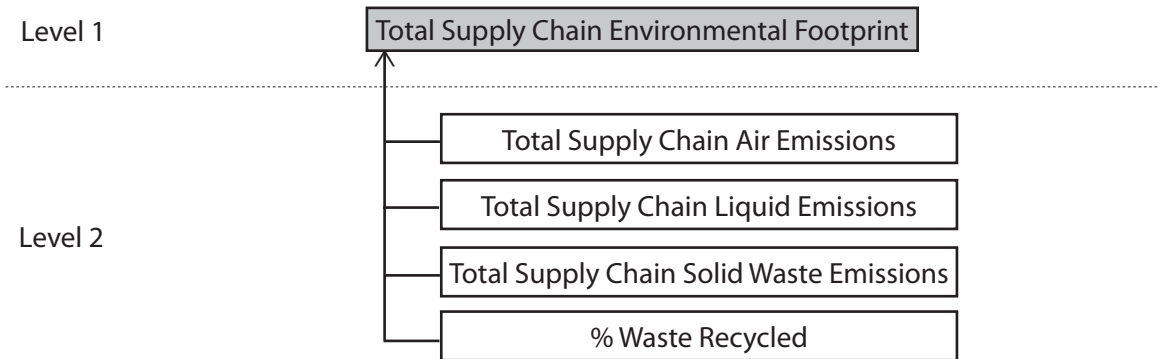
Discussion

Often, energy consumption will have to be allocated to various processes based on factors such as square footage, unit volume, revenue, or other factors.

Performance Attribute: Supply Chain Costs

Total Supply Chain Environmental Footprint

The sum of the air, liquid, and solid waste emissions associated with the SCOR Level 2 processes to Plan, Source, Make, Deliver, and Return.

Hierarchical Metric Structure**Qualitative Relationship Description**

None Identified

Quantitative Relationship (optional, if calculable)

Total Supply Chain Environmental Footprint = Total Supply Chain Air Emissions + Total Supply Chain Liquid Emissions + (Total Supply Chain Solid Waste Emissions * (1 - % waste recycled))

Calculation

Total Supply Chain Environmental Footprint = sum of air, liquid, and solid waste emissions from energy and fuel consumption and process related emissions less the sum of waste that is effectively recycled.

Data Collection

Emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations as well as direct waste stream measurement. The emission factors are generally based on energy consumption, fuel type and consumption, or process throughput. Alternatively, actual emissions can be monitored from discrete sources (e.g., smoke stacks or waste generating processes).

Discussion

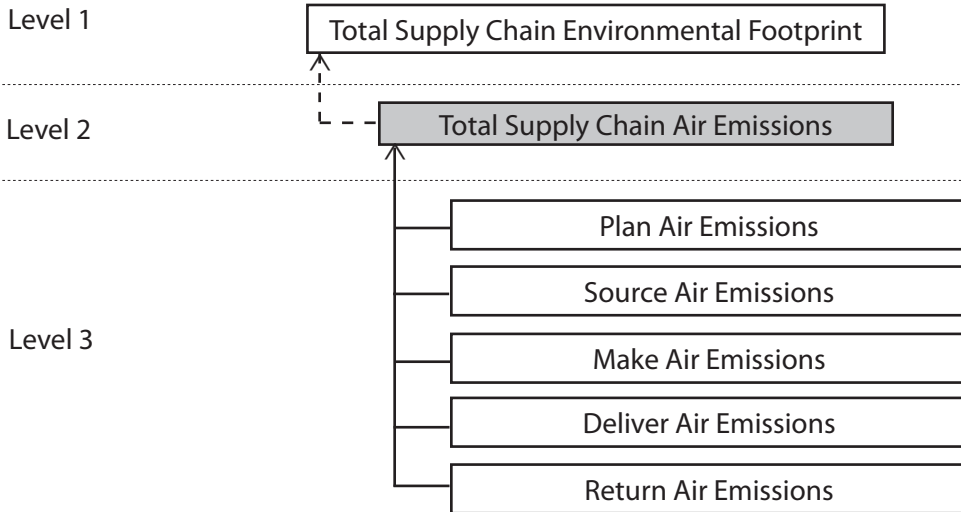
Often, a supply chain represents partial use of a facility, production line, vehicle, etc. Therefore, the emissions from this infrastructure must be apportioned based on the proportional use of the supply chain.

Performance Attribute: Supply Chain Costs

Total Supply Chain Air Emissions

The sum of the Air emissions associated with the SCOR Level 2 processes to Plan, Source, Make, Deliver, and Return.

Hierarchical Metric Structure



Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Total Supply Chain Air Emissions = Plan Air Emissions + Source + Make + Deliver + Return

Calculation

Total Supply Chain Air Emissions = sum of emissions from energy and fuel consumption and process related emissions

Data Collection

Air emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on energy consumption, fuel type and consumption, or process throughput. Alternatively, actual emissions can be monitored from discrete sources.

Discussion

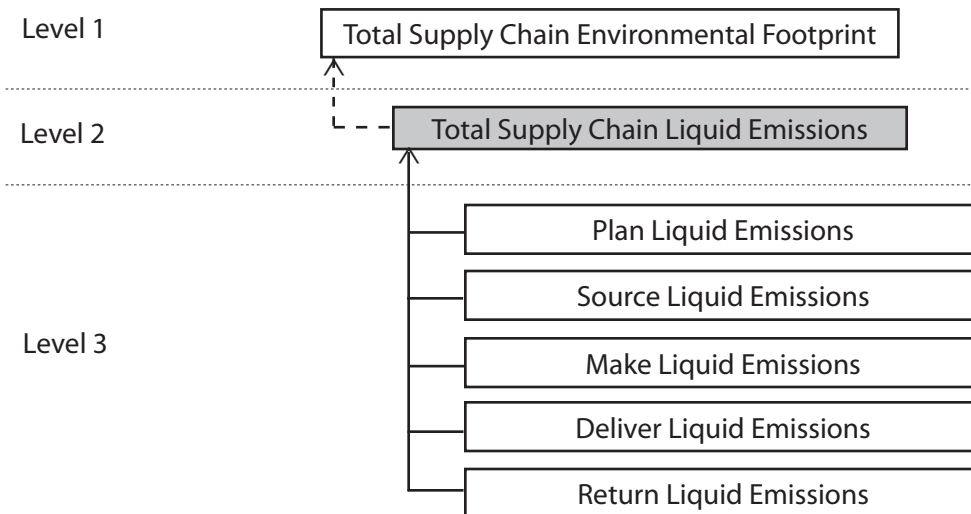
Often, a supply chain represents partial use of a facility, production line, vehicle, etc. Therefore, the emissions from this infrastructure must be apportioned based on the proportional use of the supply chain.

Performance Attribute: Supply Chain Costs

Total Supply Chain Liquid Emissions

The sum of the Liquid emissions associated with the SCOR Level 2 processes to Plan, Source, Make, Deliver, and Return.

Hierarchical Metric Structure



Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Total Supply Chain Liquid Emissions = Plan Liquid Emissions + Source + Make + Deliver + Return

Calculation

Total Supply Chain Liquid Emissions = sum of emissions from process related emissions

Data Collection

Liquid emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on process throughput. Alternatively, actual emissions can be monitored from discrete sources.

Discussion

Often, a supply chain represents partial use of a facility, production line, vehicle, etc. Therefore, the emissions from this infrastructure must be apportioned based on the proportional use of the supply chain.

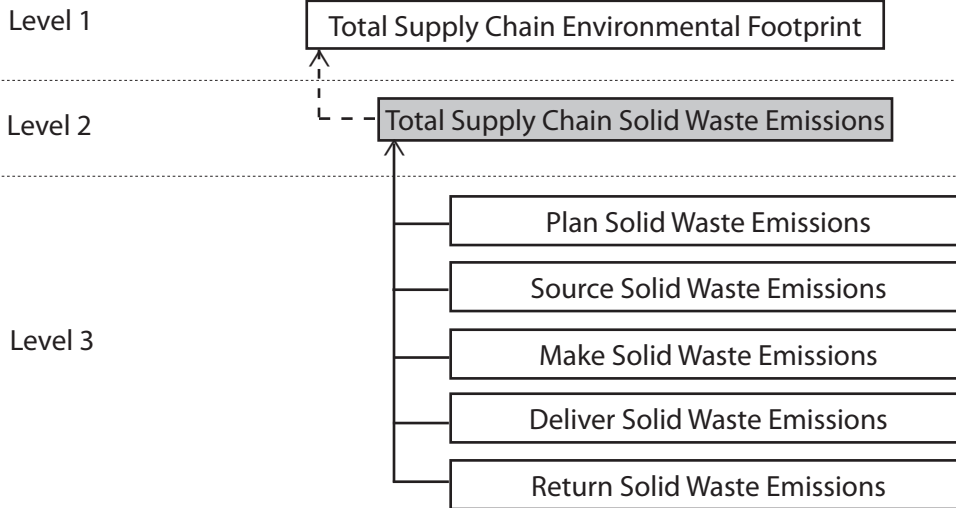
GreenSCOR

Performance Attribute: Supply Chain Costs

Total Supply Chain Solid Waste Emissions

The sum of the solid waste emissions associated with the SCOR Level 2 processes to Plan, Source, Make, Deliver, and Return.

Hierarchical Metric Structure



Qualitative Relationship Description

None Identified

Quantitative Relationship (optional, if calculable)

Total Supply Chain Solid Waste Emissions = Plan Solid Waste Emissions + Source + Make + Deliver + Return

Calculation

Total Supply Chain Solid Waste Emissions = sum of emissions from process related emissions

Data Collection

Solid Waste emissions are generally calculated using emission factors such as those created by the U.S. Environmental Protection Agency, National Environmental Research Laboratory, and various industry associations. The emission factors are generally based on process throughput. Alternatively, actual emissions can be monitored from discrete sources.

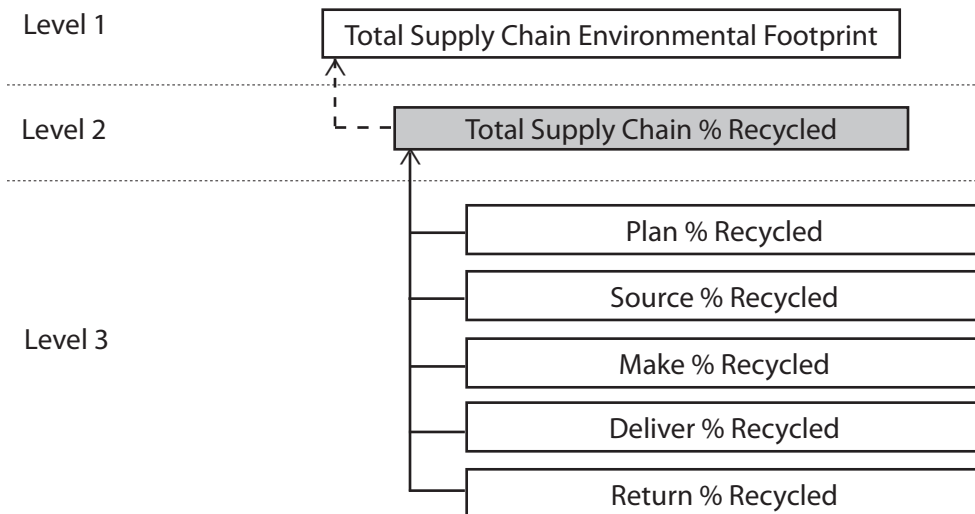
Discussion

Often, a supply chain represents partial use of a facility, production line, vehicle, etc. Therefore, the emissions from this infrastructure must be apportioned based on the proportional use of the supply chain.

Performance Attribute: Supply Chain Costs

Total Supply Chain % Recycled

The portion of the solid waste effectively recycled or reused associated with the SCOR Level 2 processes to Plan, Source, Make, Deliver, and Return.

Hierarchical Metric Structure**Qualitative Relationship Description**

None Identified

Quantitative Relationship (optional, if calculable)

Total Supply Chain % Recycled = (Plan % Recycled * Plan Solid Waste Emissions + Source % Recycled * Source Solid Waste Emissions + Make % Recycled * Make Solid Waste Emissions + Deliver % Recycled * Deliver Solid Waste Emissions + Return % Recycled * Return Solid Waste Emissions) / Total Supply Chain Solid Waste Emissions

Calculation

Total Supply Chain % Recycled = Total Supply Chain Solid Waste Emissions that are Effectively Recycled / Total Supply Chain Solid Waste Emissions

Data Collection

The amount of solid waste that is recycled is generally available through process records for reuse or invoices or bills of lading from recycling partners.

Discussion

This metrics is intended to measure the waste that is actually recycled rather than the waste that can be recycled. It is intended to reflect the true current environmental performance of the supply chain.

