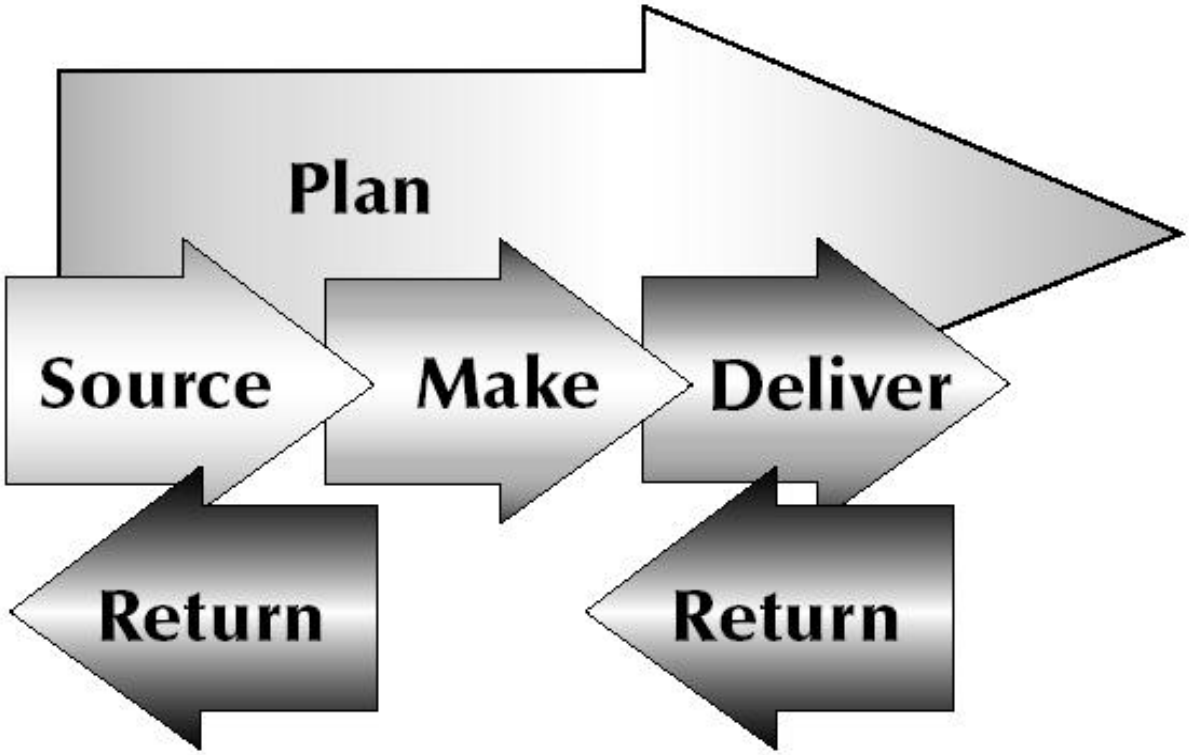
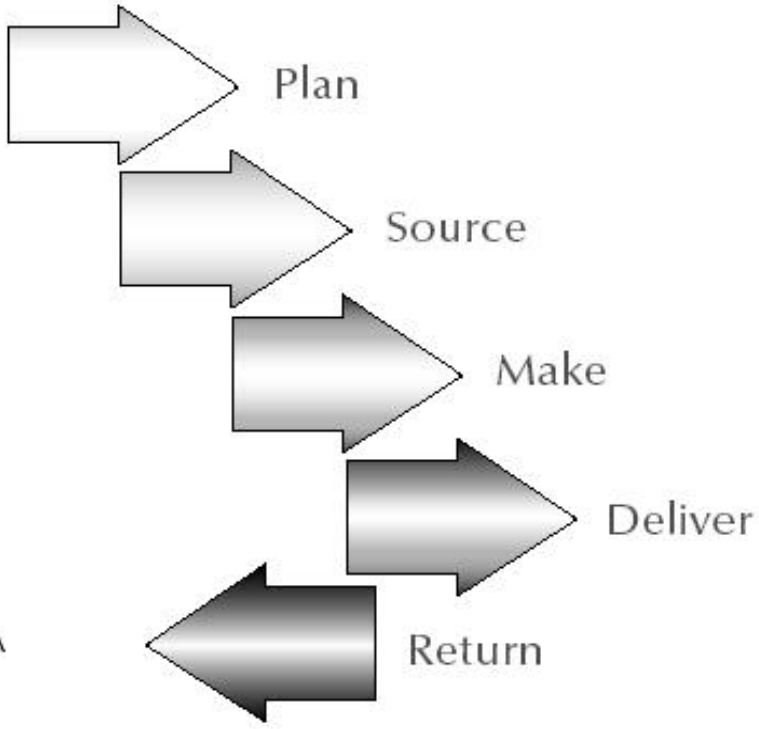


Supply-Chain Operations Reference-model

SCOR Version 6.0



SCOR
Supply-Chain Council

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Supply-Chain Operations Reference-model Version 6.0

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Supply-Chain Operations Reference-model (SCOR) 6.0

Introduction

The Supply-Chain Operations Reference-model (SCOR) is the product of the Supply-Chain Council (SCC), an independent, not-for-profit, global corporation with membership open to all companies and organizations interested in applying and advancing the state-of-the-art in supply-chain management systems and practices. The SCOR-model captures the Council's consensus view of supply chain management. While much of the underlying content of the Model has been used by practitioners for many years, the SCOR-model provides a unique framework that links business process, metrics, best practices and technology features into a unified structure to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities.

The 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 members worldwide and has established international chapters in North America, Europe, Japan, Australia/New Zealand, 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 being provided to assist new users of the SCOR-model as well as experienced users in understanding and applying the Model to realize supply chain improvements. It is also provided to orient members to the changes between Version 6.0 and its predecessor**.**

Version 6.0 of the SCOR-model is the sixth major 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. **In Version 6.0, there are three primary areas of change:**

1) The Deliver processes have been expanded to include a new Level 2 category, D4 - Deliver Retail Product. This addition addresses the unique activities and sequence of activities associated with delivering a product (normally to a consumer).
2) After over a year of use, R2 - Return of Maintenance, Repair and Overhaul (MRO) Product, has been rewritten. The processes associated with the Return of MRO products (SR2, MR2) have been updated for ease of use. The processes and their associated definitions have been clarified. In this version of the Model, only the SR2 and DR2 elements have been revised. In the next version of the Model the revisions are anticipated to extend to the SR1, DR1, SR3, and DR3 processes.
3) eBusiness best practices have been included in the Make processes continuing an update of best practice, which was initiated in Version 5.0 of the Model.

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.

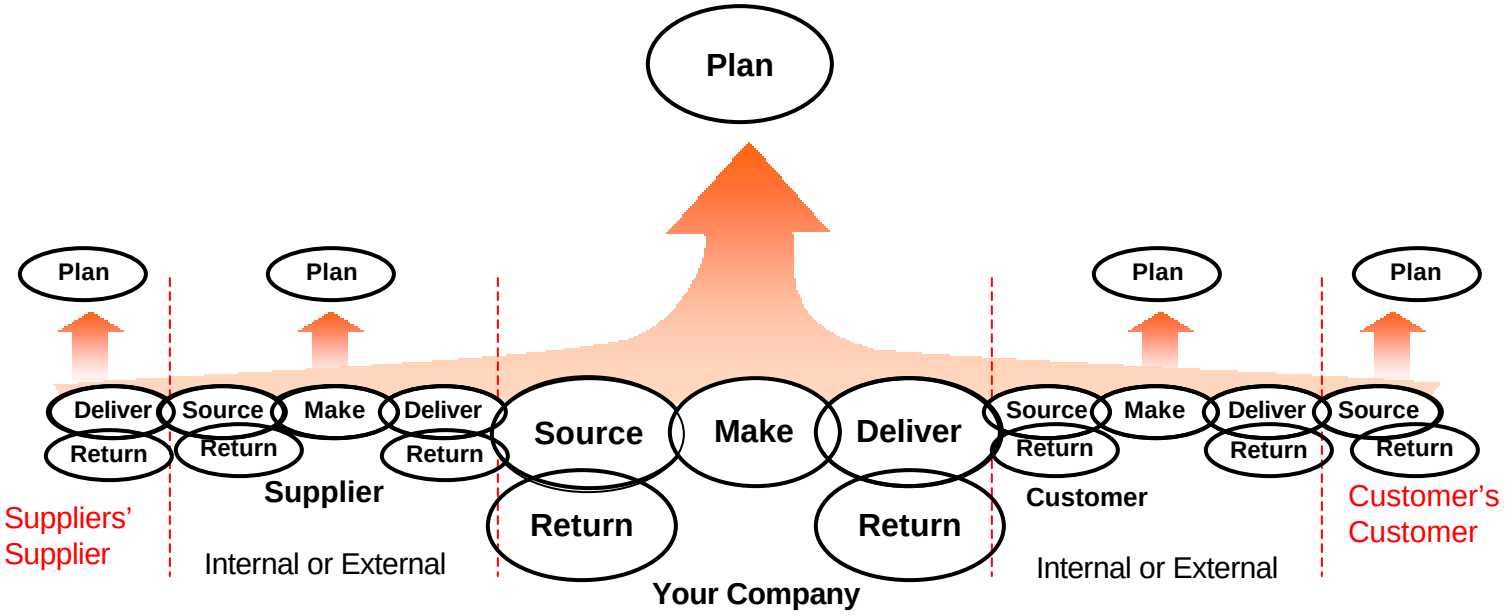

Figure 1 - SCOR is organized around five major management processes.

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 has been 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.

The Model is silent in the areas of human resources, training, and quality assurance among others. 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 other activities.

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SCOR Contains Three Levels of Process Detail

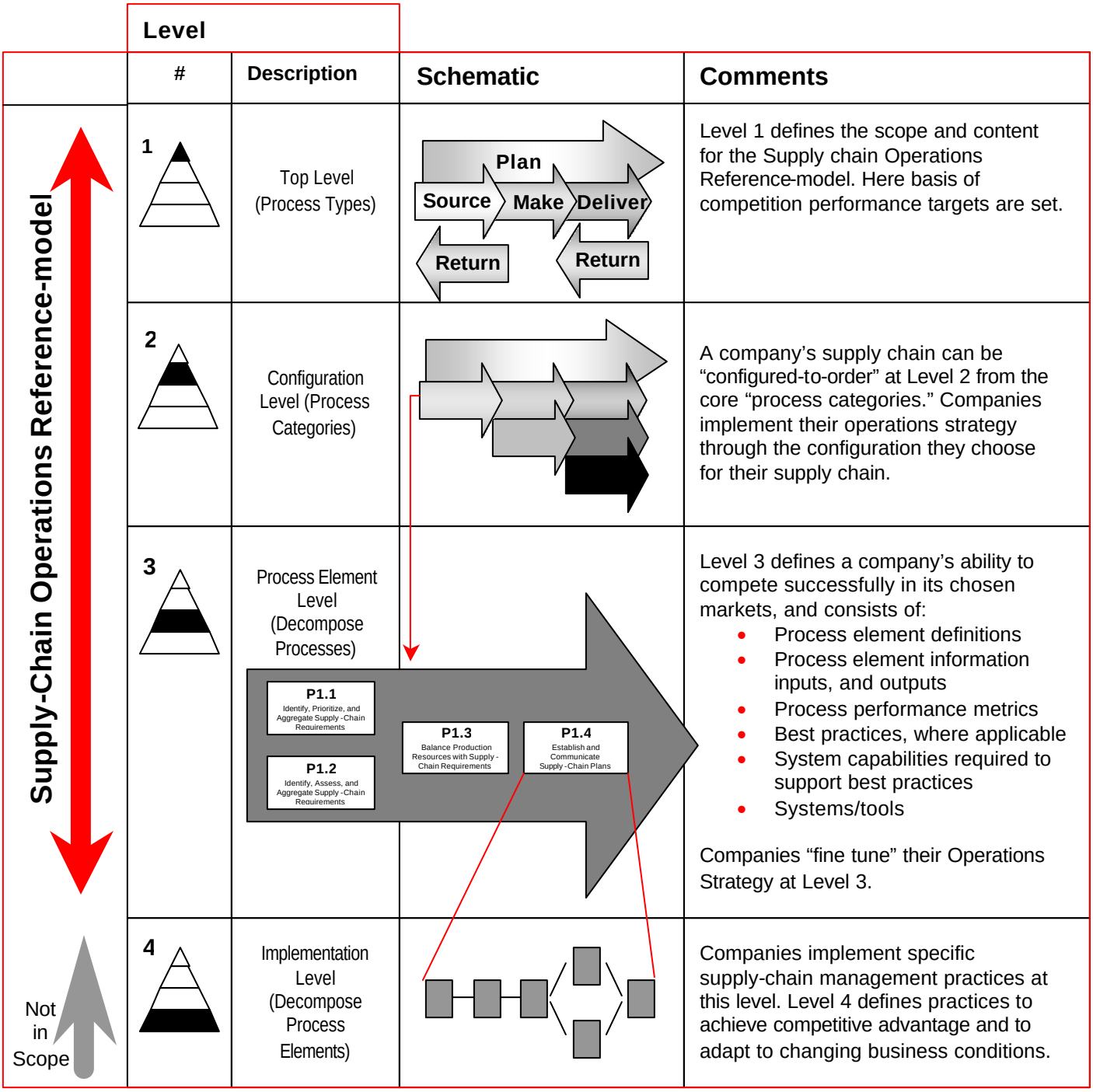


Figure 2 - SCOR is a hierarchical model with specific boundaries in regard to scope.

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.

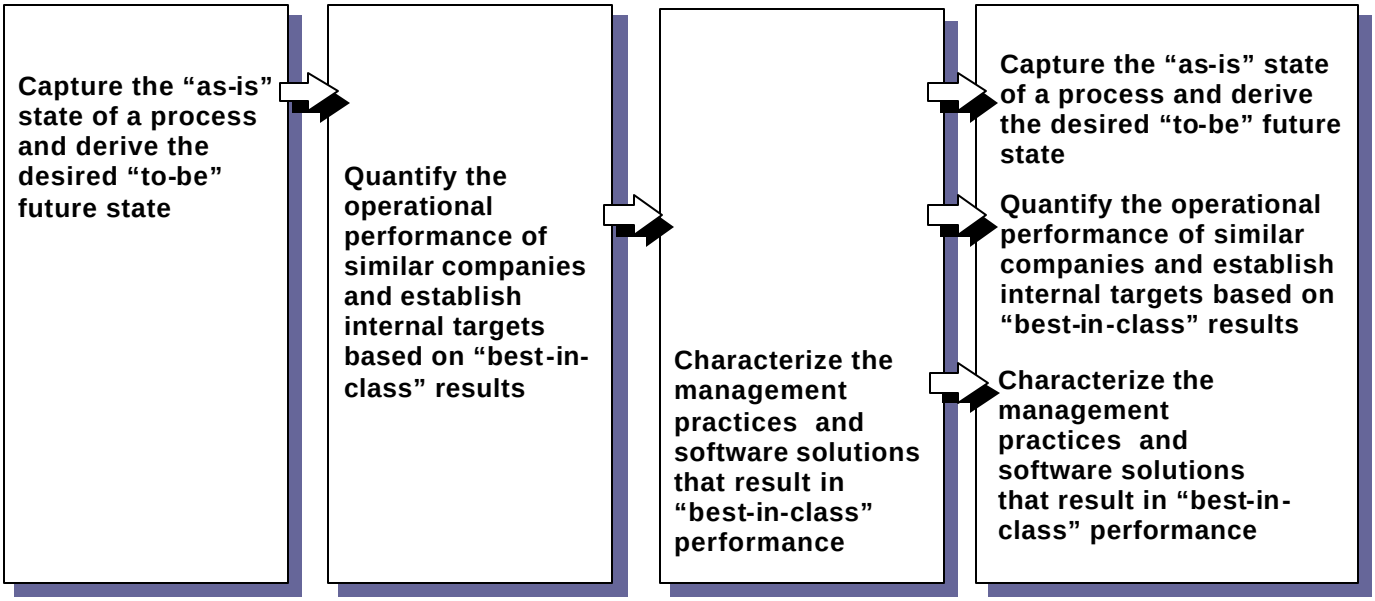


Figure 3 - SCOR is a business process reference model.

SCOR-model Structure

Besides the five basic management processes (Plan, Source, Make, Deliver, Return) that provide the organizational structure of the SCOR-model, it is useful to distinguish between the three process types in the Model: planning, execution, and enable (formerly infrastructure). A planning element is a process that aligns expected resources to meet expected demand requirements. Planning processes balance aggregated demand across a consistent planning horizon. Planning processes generally occur at regular intervals and can contribute to supply chain response time. Execution processes are triggered by planned or actual demand that changes the state of products. They include scheduling and sequencing, transforming materials and services, and moving product. Enable processes prepare, maintain, and manage information or relationships upon which planning and execution processes rely.

A set of standard notation is used throughout the Model. **P** depicts Plan elements, **S** depicts Source elements, **M** depicts Make elements, **D** depicts Deliver elements, and **R** depicts Return elements. An E preceding any of the others (e.g., EP) indicates that the process element is an Enable element associated with the Planning or Execution element (in this case, EP would be an Enable Planning element).

As indicated in **Figure 2**, the Model is hierarchical with three levels. P1.1 is a notation that indicates a third level process element. In this case, it is a Plan (P – Level 1) element that is concerned with supply chain planning (1 – Level 2) and is specific to identifying, prioritizing, and aggregating supply chain requirements (.1 – Level 3).

The SCOR-model contains 7 basic sections: Introduction, Plan, Source, Make, Deliver, Return and a Glossary. For modeling purposes, Return is documented in two locations – Source and Deliver.

Those Return processes that connect an organization with its supplier (i.e., the return of raw material) are documented as Source Return activities. Those processes that connect an organization with its customer (i.e. the receipt of returned finished goods) are documented as Deliver Return activities. This preserves the concept that Source connects an organization with its suppliers and Deliver connects an organization with its customers. The Plan and Execution (Source, Make, Deliver, Return) sections are the heart of the Model while the Glossary provides a listing of the standard process and metrics terms that are used within the Model.

Plan, Source, Make, Deliver, and Return sections are organized with a standard structure. At the beginning of each section, there are graphics that provide a visual representation of the process elements, their relationships to each other, and the inputs and outputs that are germane to each process element. Following the graphics are text tables that identify: 1) the standard name for the process element, 2) the notation for the process element, 3) SCC's "standard" definition for the process element, 4) performance attributes that are associated with the process element, 5) metrics that are associated with the performance attributes, 6) best practices that are associated with the process (candidates, not necessarily an exhaustive list), and features (generally technologically related) that can contribute to heightened performance of the process.

Within the Source, Make and Deliver process elements, there is a common internal structure. The Model focuses on "product" environments: (1) Make-to-Stock, (2) Make-to-Order, and (3) Engineer-to-Order and a new product environment (4) Retail Product. As a result, S1 denotes Source Make-to-Stock Product, S2 denotes Source Make-to-Order Product and S3 denotes Source Engineer-to-Order Product. This same convention is used for Make, i.e. M1 - Make-to-Stock, and Deliver, i.e. D2 - Deliver Make-to-Order Product. There is only one Retail Product process category and that is D4 - Deliver Retail Product. This convention was extended to Return in Version 5.0. R1 is the Return of Defective Product, R2 is the Return of Maintenance, Repair or Overhaul (MRO) Product, and R3 is the Return of Excess Product.

Within each of the planning and execution sections and following the graphic and text descriptions, the associated enable elements are described using the same graphic and text formats.

It is important to note, that like the process elements themselves, the metrics are intended to be hierarchical. Although not explicit in the Model, Level 1 metrics, as shown in **Figure 4** are typically "assigned" to P1 (Plan Supply Chain) and are decomposed (Level 2 and diagnostic metrics) to the respective planning, execution and enable elements.

Performance Attributes and Level 1 Metrics

Level 1 Metrics are primary, high level measures that may cross multiple SCOR processes. Level 1 Metrics do not necessarily relate to a SCOR Level 1 process (PLAN, SOURCE, MAKE, DELIVER, RETURN).

	Customer-Facing			Internal-Facing	
Performance Attribute	**Reliability**	**Responsive-ness**	**Flexibility**	**Cost**	**Assets**
Delivery Performance	V				
Fill Rate	**V**				
Perfect Order Fulfillment	**V**				
Order Fulfillment Lead Time		**V**			
Supply-Chain Response Time			**V**		
Production Flexibility			**V**		
Total Supply Chain Management Cost				**V**	
Cost of Goods Sold				**V**	
Value-Added Productivity				**V**	
Warranty Cost Or Returns Processing Cost				**V**	
Cash-To-Cash Cycle Time					**V**
Inventory Days Of Supply					**V**
Asset Turns					**V**

Figure 4 - SCOR Performance Attributes and Level 1 Metrics

The metrics are used in conjunction with performance attributes. In Version 4.0 of the Model, the Performance Attributes were expanded from four (Supply Chain Reliability, Supply Chain Flexibility and Responsiveness, Supply Chain Costs, and Supply Chain Asset Management) to five (Supply Chain Reliability, Supply Chain Responsiveness, Supply Chain Flexibility, Supply Chain Costs, and Supply Chain Asset Management). Generally, the impact of this exercise was to associate cycle time measures with Responsiveness and to identify needed metrics in the area of Flexibility. The table in **Figure 5** defines the performance attributes and indicates which Level 1 metrics are associated with each attribute.

The Performance Attributes are characteristics of the supply chain that permit it to be analyzed and evaluated against other supply chains with competing strategies. Just as you would describe a physical object like a piece of lumber using standard characteristics (e.g., height, width, depth), a supply chain requires standard characteristics to be described. Without these characteristics it is extremely difficult to compare an organization that chooses to be the low-cost provider against an organization that chooses to compete on reliability and performance.

Performance Attributes and Associated Level 1 Metrics

Performance Attribute	Performance Attribute Definition	Level 1 Metric
Supply Chain Delivery 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.	Delivery Performance
		Fill Rates
		Perfect Order Fulfillment
Supply Chain Responsiveness	The velocity at which a supply chain provides products to the customer.	Order Fulfillment Lead Times
Supply Chain Flexibility	The agility of a supply chain in responding to marketplace changes to gain or maintain competitive advantage.	Supply Chain Response Time
		Production Flexibility
Supply Chain Costs	The costs associated with operating the supply chain.	Cost of Goods Sold
		Total Supply Chain Management Costs
		Value-Added Productivity
		Warranty / Returns Processing Costs
Supply Chain Asset Management Efficiency	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
		Inventory Days of Supply
		Asset Turns

Figure 5 – Definitions for SCOR Performance Attributes and which Level 1 metrics are associated with each attribute.

Associated with the Performance Attributes are the Level 1 Metrics. These Level 1 Metrics are the calculations by which an implementing organization can measure how successful they are in achieving their desired positioning within the competitive market space. While these Performance Attributes are critical in implementing the Model, formal definitions were not previously included in the Model. In Version 4.0, standard Performance Attribute definitions were provided. In Version 5.0, the process tables associated with Level 2 and 3 activities were reconciled to reflect the separation of the flexibility and responsiveness attributes and to ensure that the metrics measured what they were intended to measure.

First time users of the Model should be aware that the metrics in the Model are hierarchical – just as the process elements are hierarchical. Level 1 Metrics are created from lower level calculations. (Level 1 Metrics are primary, high level measures that may cross multiple SCOR processes. Level 1 Metrics do not necessarily relate to a SCOR Level 1 process (PLAN, SOURCE, MAKE, DELIVER, RETURN).

Lower level calculations (Level 2 metrics) are generally associated with a narrower subset of processes. For example, Delivery Performance is calculated as the total number of products delivered on time and in full based on a commit date. Additionally, even lower level metrics (diagnostics) are used to diagnose variations in performance against plan. For example, an organization may wish to examine the correlation between the request date and commit date.

SCOR Version 6.0 Changes

There are a number of major changes within Version 6.0. This section will highlight those changes.

Process Changes

Retail

A number of companies with business interests focused in the retail sector identified a requirement for the Model to be modified to better describe the unique sequence of activities in the final step of delivering a retail product to the consumer. After testing the use of Version 5.0 in the modeling of specific retail supply chains, the Retail Store Operations Project Team determined that a new process, D4 Deliver Retail Product would provide a significant enhancement to the Model by: 1) identifying the common processes in this end-point in the supply chain, 2) establishing a common language to describe these activities, and 3) beginning to develop the metrics to assess performance in this environment. It is important to note that D4 is not specific to the retail industry. A number of Council members in other industry sectors (defense, chemical, electronics, etc.) and with different service offerings (manufacturing, third party logistics, etc.) validated the findings of the Project Team and confirmed that these unique processes were not retail industry-specific.

D4 - Deliver Retail Product, closely conforms to D1 - Deliver Stocked Product. The principal differences between D1 and D4 are the processes associated with selecting and routing carriers, picking product, and the consolidation of items into a final delivery that are not included in D1. Additionally, D4 includes a new process, Checkout, to capture the unique and specific activities in delivering a Retail Product. Some metrics are included in Version 6.0 for D4. There are a number of metrics that have been proposed for this new process element but consensus has not yet been reached on their definitions and calculations. It is anticipated that two new project teams, a retail pilot implementation team and a retail benchmarking team will complete these definitions and they will be included in the next version of the Model.

Additionally, as part of the Retail Project Team efforts, the group identified a requirement for a new process in Return to capture the activities associated with the issuance of credit, refund, or exchange for a returned item. Coordination with the Return Project Team has led to the inclusion of this activity within the Return processes.

Return

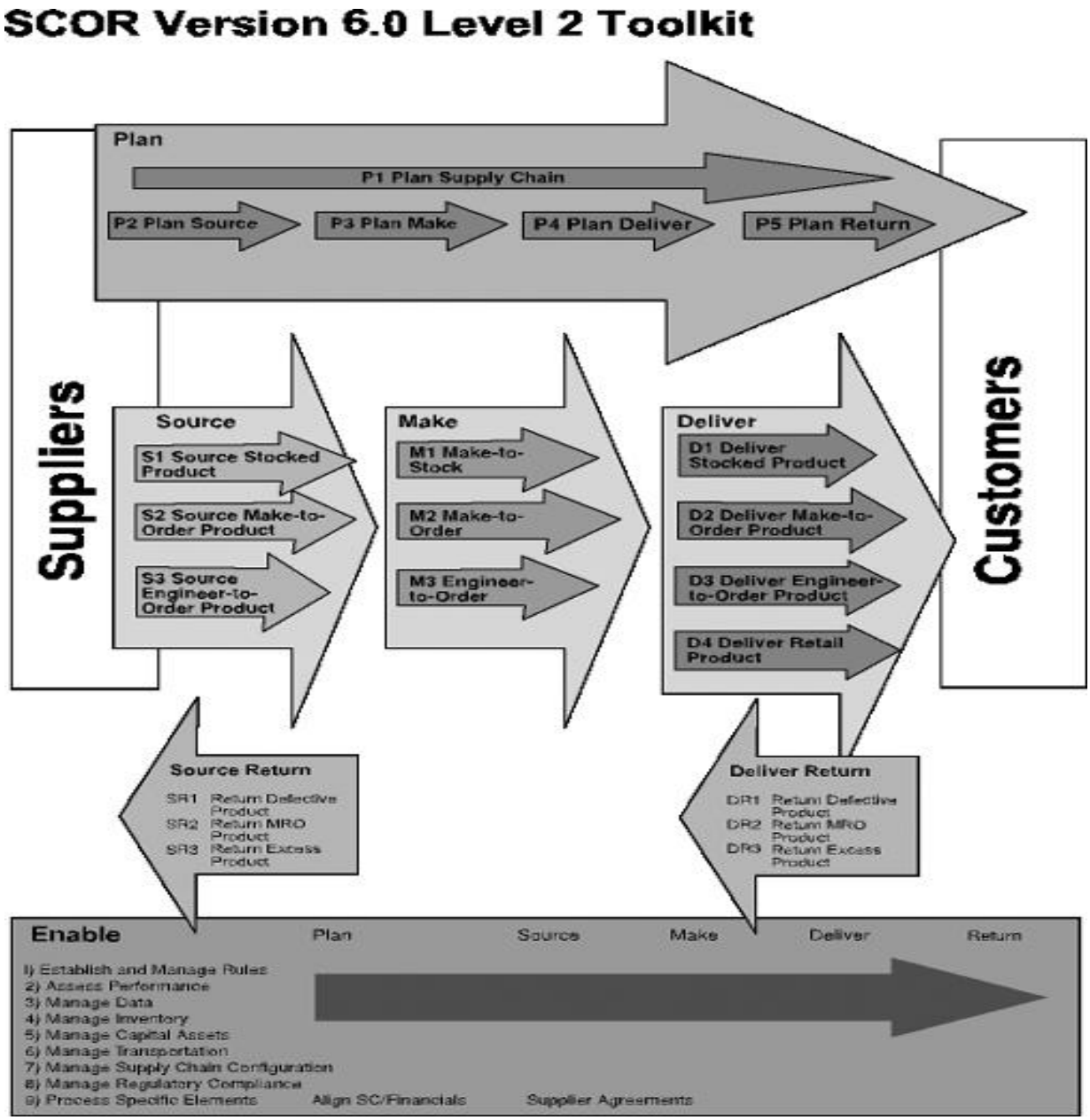
Perhaps the most significant change in Version 4.0 and Version 5.0 was the inclusion of a new Level 1 Process element: Return. The addition of Return extended the scope of the Model into the area of post-delivery customer support. The expansion of the Model to include return activities was originally proposed by a Maintenance, Repair and Overhaul task force associated with the Aerospace and Defense Special Industry Group. The change reflected the Supply Chain Council's consensus recognition of the requirement for all organizations within a supply chain to put in place activities associated with the return of products for any reason.

When Version 5.0 was released it was anticipated that the metrics, best practice and input/output sections of the Return processes would be expanded in the next release of the Model. Based on the use of Version 5.0, it was determined that there was a requirement for more precision in the Return language of the Model and how the activities were presented graphically. A Return Project was authorized with a charter to validate the existing process language and the graphic depiction of those processes. It was determined that the most efficient way to perform this validation was to first update one of the Return product categories and then use the updated category as a template for the other two. In this release of the Model SR2 and DR2 (MRO Product), have been updated. The graphics and the process descriptions have been updated and metrics, and inputs and outputs have been expanded. This work will be replicated for R1 and R3 in the next Model revision.

Additionally, the SR2 and DR2 processes have been completely separated and the flow has been revised to reinforce the "building block" modeling convention. This convention recognizes that there are activities that both the returning organization and the receiving organization are required to perform. As such, these activities are associated with Source (returning raw materials to the supplier) and Deliver (receiving returned finished goods from the customer).

eBusiness Best Practice Changes

The Council has long recognized the changing environment in the technology associated with the conduct of supply chain practice. Continuous review of technology's impact on supply chain practice has led to the conclusion that although the technology has been changing the processes remain the same. Best practice, however, that supports the processes is continuing to evolve and this Version of the Model completes a specific effort to update the best practice and technology sections of the process table to formally recognize proven eBusiness methodologies and technology.



The Technical Change Process

The SCOR Model is developed and maintained by the voluntary efforts of the Supply Chain Council 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.

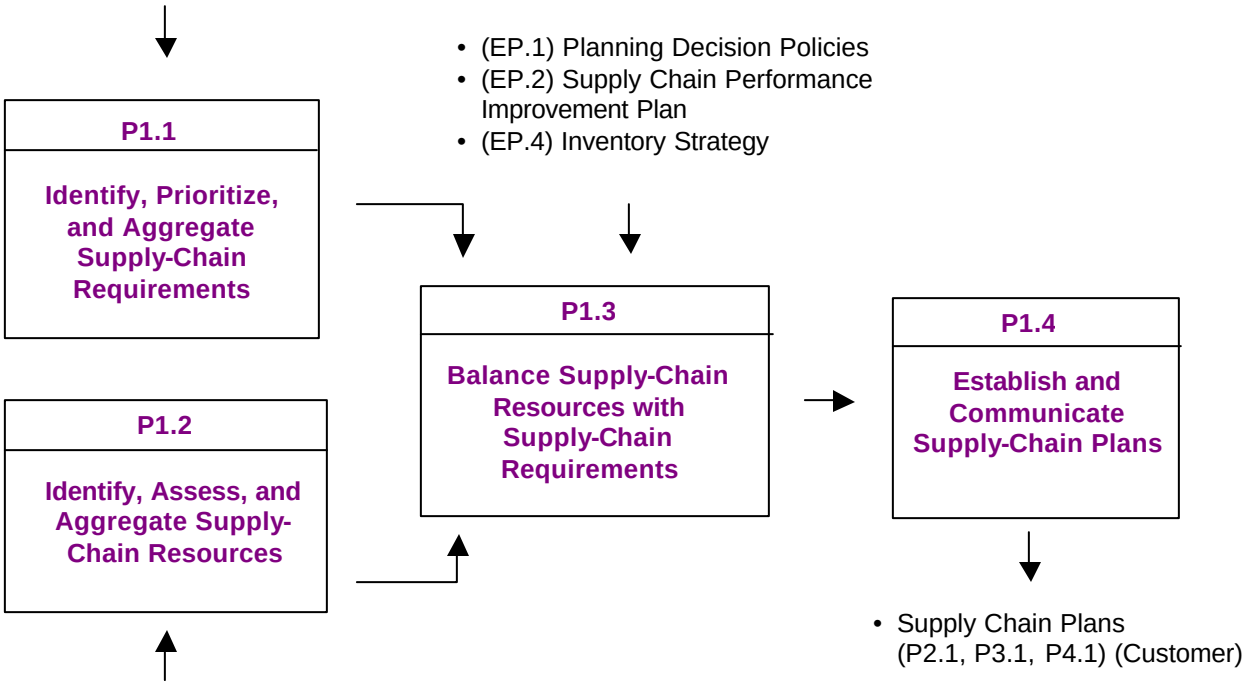
The current technical development process relies on project teams composed of volunteers from Supply Chain Council member organizations. These project teams are short-lived groups that focus on specific Model challenges. It is expected that the normal term of a project team will be between 3-6 months. The change process and the coordination of the project team activities is led by the Technical Development Steering Committee (TDSC), a standing body elected by their peers in the Council. Changes to the Model are normally initiated by a Council member or members (but may be initiated by a Special Industry Group, an implementation project team, or the Chief Technical Officer). The primary mechanism for changing the Model is the Project Team. These self-organizing and self-directed teams propose areas of investigation, pursue and develop proposals for Model development and publish research results on the Council website. These activities are coordinated by the Supply Chain Council's Technical Development Steering Committee, which is comprised of elected representatives from the Council's membership.

The Model change process is documented on the SCC's website. Essentially, the process consists of: 1) The Council issues a call for volunteers to work on an identified need for revision or change, 2) volunteers submit a Charter Proposal to the TDSC outlining the concept, scope of work, schedules and milestones, and identifying the volunteer resources, 3) the TDSC reviews the proposed Charter and provides feedback on the proposed changes to the initiating group, 4) upon approval, the Project Team crafts the details of their scope of work and determines whether it is likely their efforts will lead to a Model change (which generally includes the modification of SCOR processes, metrics, best practice, features and inputs and outputs) or a research report (white paper), 5) the Project Team proposes how to integrate proposed changes into the overall Model, 6) after final technical review the TDSC forwards the technical community recommendations for proposed changes/additions to the SCC Board of Directors, and 7) following the approval of the Board, the new Model is published for the SCC membership.

PLAN

P1: Plan Supply Chain

- (Customer) Customer Requirements
- (D1.3, D1.10) Order Backlog, Shipments
- (EP.3) Planning Data
- (EP.9) Revised Aggregate Forecast and Projections, Revised Business Assumptions



- (EP.1) Planning Decision Policies
- (EP.2) Supply Chain Performance Improvement Plan
- (EP.4) Inventory Strategy

- Supply Chain Plans (P2.1, P3.1, P4.1) (Customer)

- (P2.4) Sourcing Plans
- (P3.4) Product MAKE Plans
- (P4.4) Delivery Plans
- (EP.3) Planning Data
- (EP.5, EP.6) Projected Internal and External Production Capacity
- (EP.5, EP.6) Revised Capital Plan
- (EP.5, EP.6) Outsource Plan
- (EP.8) Regulatory Requirements
- (Customer) Inventory

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Process Category: Plan Supply Chain	Process Number: P1
Process Category Definition	
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.	
Performance Attributes	**Metric**
Reliability	Forecast Accuracy Delivery Performance to Customer Request Date Fill Rate
Responsiveness	Cumulative Source/Make Cycle Time
Flexibility	Re-plan Cycle Time
Cost	Demand/Supply Planning Costs Sales per Employee
Assets	Return on Assets Capacity Utilization Inventory Days of Supply Cash-to-cash Cycle Time
Best Practices	**Features**
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
Capability to run "simulated" full-stream supply/demand balancing for "what-if" scenarios	Supply chain modeling and visualization system
A change in the demand signal instantaneously "reconfigures" the production and supply plans	Event-driven supply chain re-planning
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
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
Tools support balanced decision making (eg, trade-off between service level and inventory investment)	Supply chain planning optimization system
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

Process Element: Identify, Prioritize and Aggregate Supply Chain Requirements	Process Element Number: P1.1

Process Category Definition

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
Reliability	Forecast Accuracy
Responsiveness	Intra-Manufacturing Replan Cycle Time
Flexibility	None Identified
Cost	Supply-Chain Finance Costs Forecasting and Demand MIS Costs
Assets	None Identified
Best Practices	**Features**
Collaboration among Supply Chain partners extends outwards to customers, spanning the supply chain. Planning Replanning Business Rules Plan Changes	None Identified
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 B2B Integration and Application Server 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
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

Inputs	Plan	Source	Make	Deliver
(Customer) Customer Requirements				
Order Backlog, Shipments				D1.3, D1.10
Planning Data	EP.3			
Revised Aggregate Forecast and Projections, Revised Business Assumptions	EP.9			

Outputs	Plan	Source	Make	Deliver

Process Element: Identify, Prioritize and Aggregate Supply Chain Resources	Process Element Number: P1.2
Process Category Definition	
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**
Reliability	None identified
Responsiveness	None identified
Flexibility	Cumulative Source/Make Cycle Times Intra-Manufacturing Replan Cycle Time
Cost	Planning Costs as a % of Total Supply Chain Costs Supply Chain Finance Costs Product Data (MIS) Management Costs Manage Finished Goods Data (MIS)
Assets	Inventory Days of Supply Inventory Turns Return On Assets Cash-to-Cash Cycle Time
Best Practices	**Features**
Collaborative Planning, Forecasting and Replenishment (CPFR)	Business process modeling Workflow systems Collaboration Tools Advanced Planning Optimization Constraint based planning Integrated resource and material plan B2B Integration and Application Server Systems
Joint Service Agreements (JSA)	Collaborative Planning Systems
Digital links (Internet, EDI. Etc.) among supply chain members.	Real-time exchange of supply chain information between supply chain members Collaborative planning systems, Internet Trading Exchanges.
Lead times updated monthly.	None Identified
Categorize 100% of total inventory (active, usable, excess, obsolete) for appropriate action.	None Identified
Review product profitability.	ABC and cost modeling.

Inputs	Plan	Source	Make	Deliver
(Customer) Inventory				
Sourcing Plans	P2.4			
Product MAKE Plans	P3.4			
Delivery Plans	P4.4			
Planning Data	EP.3			
Projected Internal and External Production Capacity	EP.5, EP.6			
Revised Capital Plan	EP.5, EP.6			
Outsource Plan	EP.5, EP.6			
Regulatory Requirements	EP.8			

Outputs	Plan	Source	Make	Deliver

Process Element: Balance Supply-Chain Resources with Supply-Chain Requirements	Process Element Number: P1.3

Process Category Definition

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.

Performance Attributes	Metric
Reliability	Delivery Performance to customer request date Fill Rate Perfect Order Fulfillment
Responsiveness	Order Fulfillment Lead Time
Flexibility	Supply Chain Response Time Production Flexibility
Cost	Total Supply-Chain Costs Value Added Productivity
Assets	Inventory days of Supply Asset Turns Cash-to-Cash Cycle Time

Best Practices	Features
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.
Collaborative Planning, Forecasting and Replenishment (CPFR)	Supply chain planning systems and communication technologies as well as newly defined standards that reflect the CPFR model and 'participate' in the entire planning process.
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.
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.

Inputs	Plan	Source	Make	Deliver
Planning Decision Policies	EP.1			
Supply Chain Performance Improvement Plan	EP.2			
Inventory Strategy	EP.4			

Outputs	Plan	Source	Make	Deliver

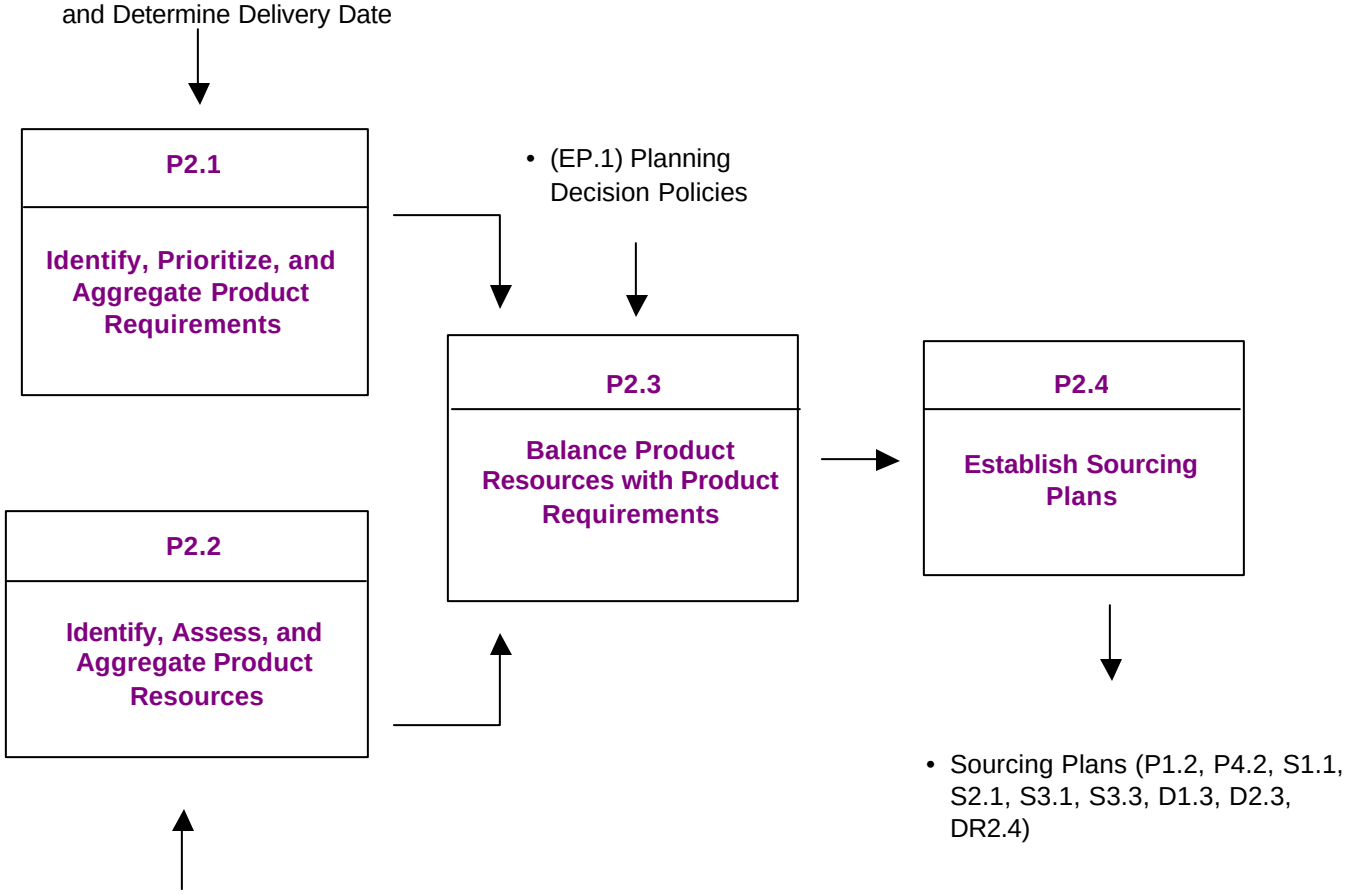
Process Element: Establish and Communicate Supply Chain Plans	Process Element Number: P1.4
Process Element Definition	
The establishment and communication of courses of action over the appropriate time-defined (long-term, annual, monthly, weekly) planning horizon and interval, representing a projected appropriation of supply-chain resources to meet supply-chain requirements.	
Performance Attributes	**Metric**
Reliability	Perfect Order Fulfillment On-time Delivery
Responsiveness	None identified
Flexibility	Cumulative Source/Make Cycle Time Total Supply Chain Response Time
Cost	Supply Chain Finance Costs Inventory Carrying Costs
Assets	Inventory Days of Supply (Inventory Turns) Return on Assets Cash-to-Cash Cycle time
Best Practices	**Features**
Collaboration among Supply Chain partners extends outwards to suppliers and customers, spanning the supply chain. Planning Replanning Business Rules Plan Changes	Supply Chain Advanced Planning Systems Supply Chain Integration Systems Integration between supply chain Advanced Planning and ERP execution systems Supply Chain Capacity Planning Systems
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
Joint Service Agreements (JSA)	Collaborative Planning Systems
Digital links (Internet, EDI. Etc.) connecting (or between) supply chain members.	Real-time exchange of supply chain information between supply chain members *Collaborative planning systems, Internet Trading Exchanges.*
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

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Supply Chain Plans (Customer)	P2.1, P3.1, P4.1			

P2: Plan Source

- (P1.4) Establish and Communicate Supply Chain Plans
- (P3.4) Production Plans
- (P4.4) Delivery Plans
- (EP.3) Planning Data
- (EP.7) Item Master, Bill of Materials, Product Routings
- (D2.3, D3.3) Reserve Resources and Determine Delivery Date



- (EP.1) Planning Decision Policies

- Sourcing Plans (P1.2, P4.2, S1.1, S2.1, S3.1, S3.3, D1.3, D2.3, DR2.4)

- (Supplier) Product Availability
- (S1.4, S2.4, S3.6) Inventory Availability
- (S1.1, S2.1, S3.3) Sourced Product on Order
- (EP.3) Planning Data

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Process Category: Plan Source	Process Number: P2
Process Category Definition	
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**
Reliability	Supplier Delivery on-time Delivery Performance Supplier Fill Rate
Responsiveness	Cumulative Source Cycle Time
Flexibility	Source Flexibility
Cost	None identified
Assets	None identified
Best Practices	**Features**
EDI links integrate supplier resource information (inventory, capacity availability, etc.) with own resources	Inter-company resource planning with EDI/Internet communication
Joint Service Agreements with suppliers define the levels of "flexibility" or resource upside available within stated lead times and agreed upon conditions	None Identified
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
All key participants in the supply chain, including strategic partners, have full visibility of the demand/supply plan	Supply Chain Event Management Systems

Process Element: Identify, Prioritize, and Aggregate Product Requirements	Process Element Number: P2.1
Process Element Definition	
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**
Reliability	Forecast Accuracy
Responsiveness	None Identified
Flexibility	None identified
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
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 Master production scheduling reflects management of capacity and/or supply constraints Sales and operations agree to limits of short term flexibility	None Identified

Inputs	Plan	Source	Make	Deliver
Establish and Communicate Supply Chain Plans	P1.4			
Production Plans	P3.4			
Delivery Plans	P4.4			
Planning Data	EP.3			
Item Master, Bill of Materials, Product Routings	EP.7			
Reserve Resources and Determine Delivery Date				D2.3, D3.3

Outputs	Plan	Source	Make	Deliver

Process Element: Identify, Assess, and Aggregate Product Resources	Process Element Number: P2.2
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	None identified
Assets	None Identified
Best Practices	**Features**
Capacity and supply constraints identified during MPS schedule process are balanced against demand during the planning cycle	None Identified
Inventory is planned at the part level, based on supply and demand variability. Inventory performance is measured at the dollar and unit levels Inventory targets are reviewed and adjusted frequently Obsolete inventory is reviewed at the part number level	None Identified

Inputs	Plan	Source	Make	Deliver
(Supplier) Product Availability				
Inventory Availability		S1.4, S2.4, S3.6		
Sourced Product on Order		S1.1, S2.1, S3.3		
Planning Data	EP.3			

Outputs	Plan	Source	Make	Deliver

Process Element: Balance Product Resources with Product Requirements	Process Element Number: P2.3
Process Element Definition	
The process of developing a time-phased course of action that commits resources to meet requirements.	
Performance Attributes	**Metric**
Reliability	Supplier on-time Delivery Performance
Responsiveness	None identified
Flexibility	None identified
Cost	Material planning costs
Assets	None identified
Best Practices	**Features**
Suppliers share responsibility for balancing supply and demand through Joint Service Agreements	None Identified

Inputs	Plan	Source	Make	Deliver
Planning Decision Policies	EP.1			

Outputs	Plan	Source	Make	Deliver

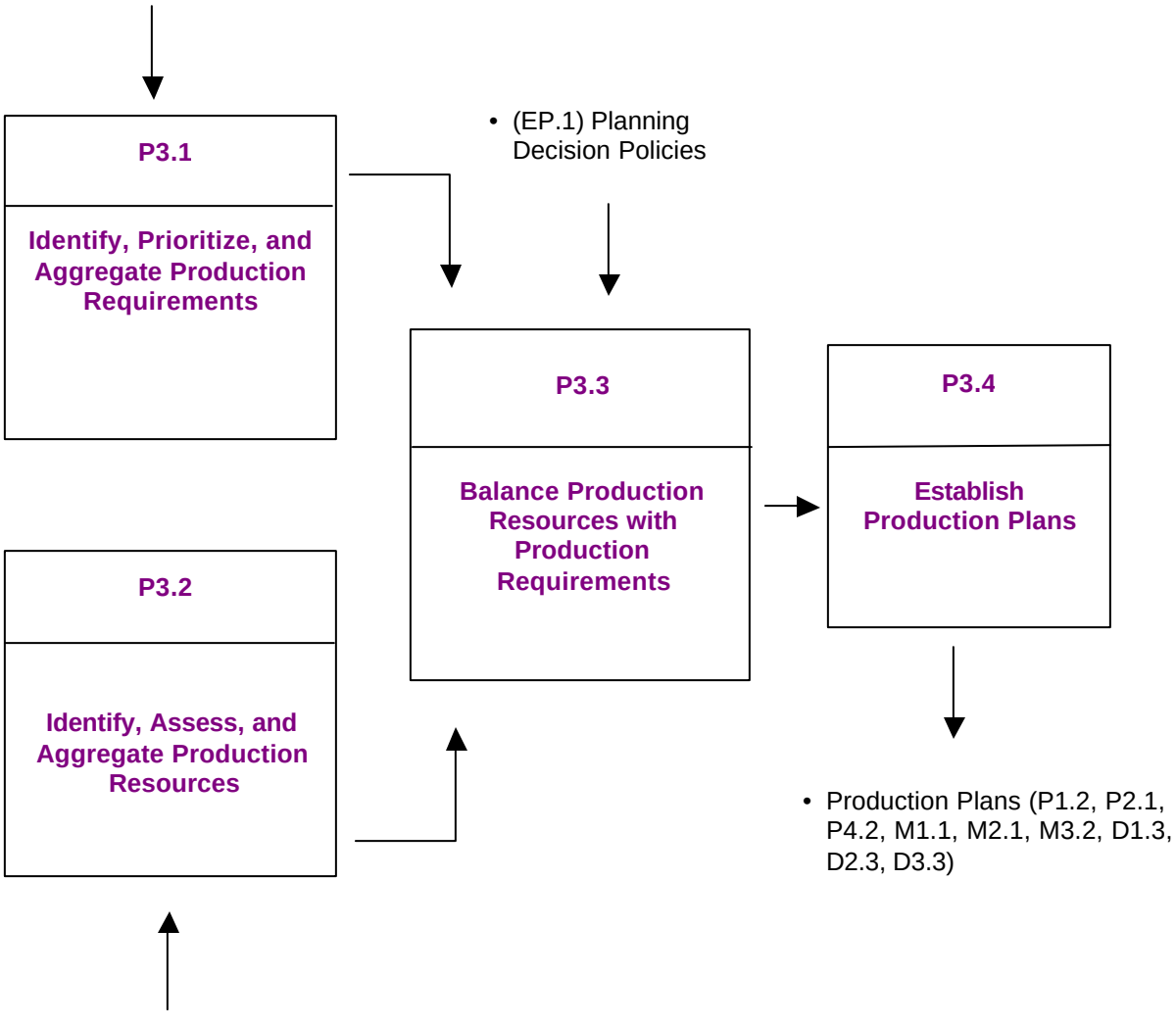
Process Element: Establish Sourcing Plans	Process Element Number: P2.4
Process Element Definition	
The establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet sourcing plan requirements.	
Performance Attributes	Metric
Flexibility and Responsiveness	**Supplier Cycle Time**
Reliability	Supplier on-time Delivery Performance Supplier Fill Rate
Responsiveness	None identified
Flexibility	None identified
Cost	None identified
Assets	None Identified
Best Practices	**Features**
Digital Linkage (EDI, XML, etc.) is used to provide real-time demand information and handle routine transactions	None Identified
Blanket purchase orders cover period requirements	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Sourcing Plans	P1.2, P4.2	S1.1, S2.1, S3.1, S3.3		D1.3, D2.3, DR2.4

P3: Plan Make

- (P1.4) Supply Chain Plans
- (P4.4) Delivery Plans
- (EP.3) Planning Data
- (EP.7) Item Master, Bill of Materials, Product Routings
- (D2.3, D3.3) Reserve Resources and Determine Delivery Date



- (EP.1) Planning Decision Policies

- Production Plans (P1.2, P2.1, P4.2, M1.1, M2.1, M3.2, D1.3, D2.3, D3.3)

- (P2.4) Sourcing Plans
- (EP.3) Planning Data
- (M1.1, M2.1, M3.2) Production Schedule
- (M1.2, M2.2, M3.3) Inventory Availability

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Process Category: Plan Make	Process Element Number: P3
Process Category Definition	
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**
Reliability	Production plan adherence
Responsiveness	None identified
Flexibility	Cumulative Make Cycle Time
Cost	None identified
Assets	Total WIP Inventory DOS
Best Practices	**Features**
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

Process Element: Identify, Prioritize, and Aggregate Production Requirements	Process Element Number: P3.1
Process Element Definition	
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**
Reliability	Forecast Accuracy
Responsiveness	None identified
Flexibility	None Identified
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
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

Inputs	Plan	Source	Make	Deliver
Supply Chain Plans	P1.4			
Delivery Plans	P4.4			
Planning Data	EP.3			
Item Master, Bill of Materials, Product Routings	EP.7			
Reserve Resources and Determine Delivery Date				D2.3, D3.3

Outputs	Plan	Source	Make	Deliver

Process Element: Identify, Assess, and Aggregate Production Resources	Process Element Number: P3.2
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
Inventory targets are reviewed and adjusted frequently	None Identified
Obsolete inventory is reviewed at the part number level	None Identified

Inputs	Plan	Source	Make	Deliver
Sourcing Plans	P2.4			
Planning Data	EP.3			
Production Schedule			M1.1, M2.1, M3.2	
Inventory Availability			M1.2, M2.2, M3.3	

Outputs	Plan	Source	Make	Deliver

Process Element: Balance Production Resources with Product Creation Requirements	Process Element Number: P3.3
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	Cumulative Make Cycle Time
Cost	None Identified
Assets	Total WIP Inventory DOS
Best Practices	**Features**
Inventory targets are reviewed and adjusted frequently	Digital Linkages using XML standards (Rosettanet, eBXML, OAGI) to automatically query inventory levels.

Inputs	Plan	Source	Make	Deliver
Planning Decision Policies	EP.1			

Outputs	Plan	Source	Make	Deliver

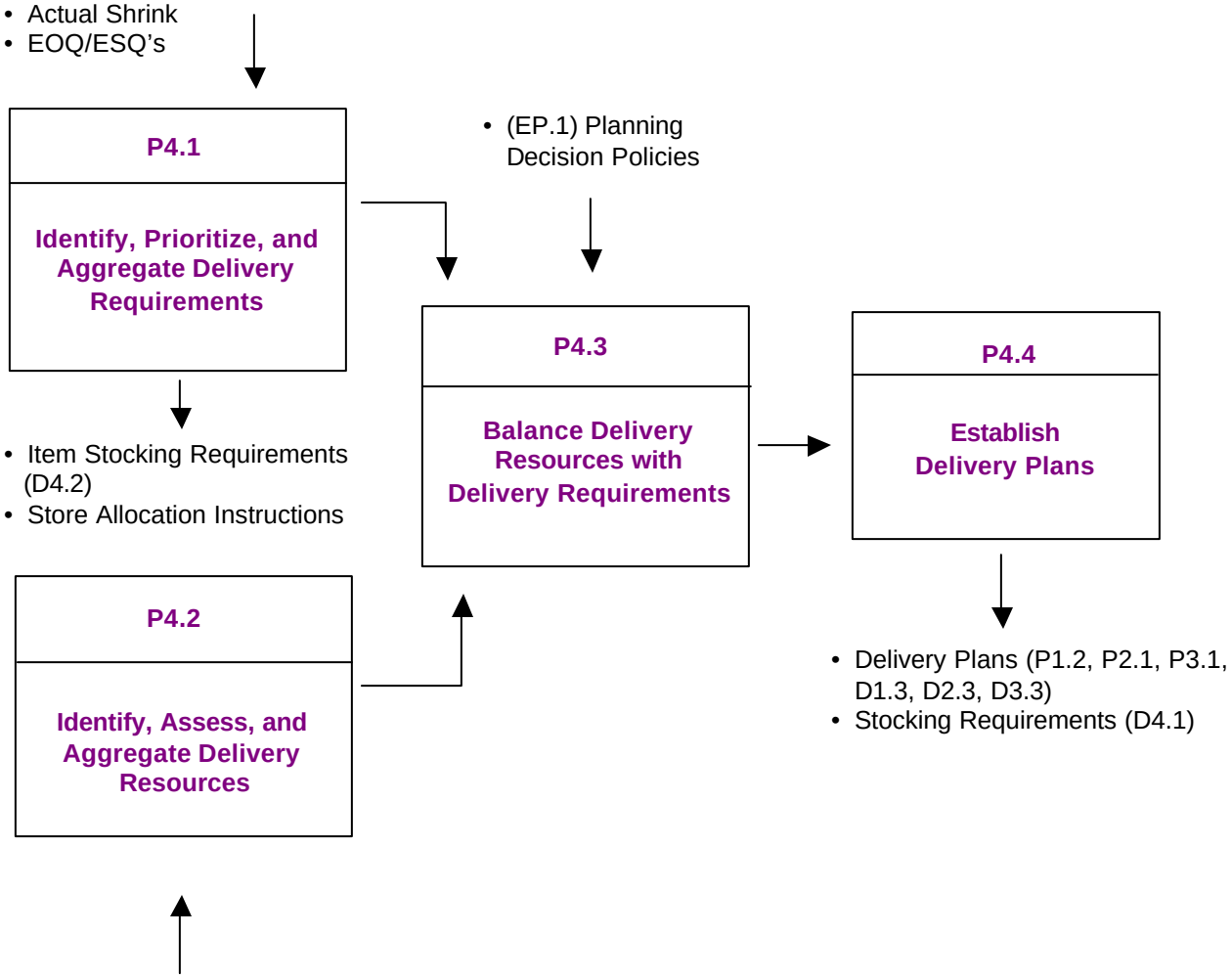
Process Element: Establish Production Plans	Process Element Number: P3.4
Process Element Definition	
The establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet production and operating plan requirements.	
Performance Attributes	**Metric**
Reliability	Production Plan Adherence
Responsiveness	None identified
Flexibility	Cumulative Make Cycle Time
Cost	None identified
Assets	Total WIP Inventory DOS
Best Practices	**Features**
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.

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Production Plans	P1.2, P2.1, P4.2		M1.1, M2.1, M3.2	D1.3, D2.3, D3.3

P4: Plan Deliver

- (P1.4) Supply Chain Plans
- (EP.3) Planning Data
- (EP.9) Service Levels
- (EP.7) Item Master
- (EP.7) Routings
- (D1.3, D2.3, D3.3) Order Backlog
- (Customer) Customer Requirements
- Merchandise category/classification
- Product/category lifecycle
- (D4.6) Point of Sale Data (daily)
- Store Shelf Inventory Counts
- Dc/vendor Lead Time
- Dc/vendor Transit Time
- Year-to-Year for Like SKU/Subclass
- Stock-out History
- Promotion/Event Plans
- Markdown Plans
- Actual Shrink
- EOQ/ESQ's



- (P2.4) Sourcing Plans
- (P3.4) Production Plans
- (EP.3) Planning Data
- (D1.3, D2.3) Inventory Availability/Delivery Date
- (D3.3) Resource Availability

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Process Element: Plan Deliver	Process Element Number: P4
Process Element Definition	
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**
Reliability	Forecast Accuracy Delivery Performance to Customer Request Date Fill rate
Responsiveness	None Identified
Flexibility	Order Management Cycle Time
Cost	Total Deliver Costs
Assets	Finished Goods Inventory DOS
Best Practices	**Features**
Distinct and consistent linkages exist to ensure disruptions and opportunities in delivery resources are quickly and accurately communicated and responded to	Tightly integrated DRP/ERP Systems Supply Chain Event Management Systems Trading Partner Networks including Third Party Logistics Providers
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

Process Element: Utilize Current Label	Process Element Number: P4.1
Process Element Definition	
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**
Reliability	Forecast Accuracy Sales Floor Error Rates On Shelf Locations Shelf SKU Accuracy
Responsiveness	In-Stock Position (Inventory)
Flexibility	Order Management Cycle Time % Overtime Labor
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
Eliminate “special deals” sales to reduce returns and improve forecast accuracy (reduces uncertainty, lowers safety stock requirements, cheaper to administer)	None Identified
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 program in which sourcing entity manages customer inventory and plans replenishment	VMI support in demand planning or supply chain planning
Forecasts are replaced with actual customer replenishment signals and orders where possible	B2B Integration and Application Server Systems
Unplanned orders are accepted only when there is no impact on overall product delivery plan	None Identified
Electronic matching between POS data and store inventory (shelves and back room)	Integrated software 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
Ideal Stock position Based on Days/Weeks of Supply	Pilot by Wal-Mart/MIT
RFID and other tagging	POG software/field force
Planogram Flexibility for Seasonal/Promotional Changes	None Identified

Inputs	Plan	Source	Make	Deliver
(Customer) Customer Requirements				
Supply Chain Plans	P1.4			
Planning Data	EP.3			
Service Levels	EP.9			
Item Master	EP.7			
Routings	EP.7			
Order Backlog				D1.3, D2.3, D3.3
Merchandise category/classification				
Product/category lifecycle				
Point of Sale Data (daily)				D4.6
Store Shelf Inventory Counts				
Dc/vendor Lead Time				
Dc/vendor Transit Time				
Year-to-Year for Like SKU/Subclass				
Stock-out History				
Promotion/Event Plans				
Markdown Plans				
Actual Shrink				
EOQ/ESQ's				

Outputs	Plan	Source	Make	Deliver
Item Stocking Requirements				D4.2
Store Allocation Instructions				

Process Element: Identify, Assess, and Aggregate Delivery Resources	Process Element Number: P4.2
Process Element Definition	
The process of identifying, evaluating, and considering, as a whole with constituent parts, all things that add value in the delivery of a product.	
Performance Attributes	**Metric**
Reliability	Forecast Accuracy
Responsiveness	None Identified
Flexibility	Order Management Cycle Time
Cost	None identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver
Sourcing Plans	P2.4			
Production Plans	P3.4			
Planning Data	EP.3			
Inventory Availability/Delivery Date				D1.3, D2.3
Resource Availability				D3.3

Outputs	Plan	Source	Make	Deliver

Process Element: Balance Delivery Resources with Delivery Requirements	Process Element Number: P4.3
Process Element Definition	
The process of developing a time-phased course of action that commits delivery resources to meet delivery requirements	
Performance Attributes	**Metric**
Reliability	Delivery Performance to Customer Request Date
Responsiveness	None Identified
Flexibility	None Identified
Cost	None identified
Assets	None Identified
Best Practices	**Features**
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

Inputs	Plan	Source	Make	Deliver
Planning Decision Policies	EP.1			

Outputs	Plan	Source	Make	Deliver

Process Element: Establish Delivery Plans	Process Element Number: P4.4
Process Element Definition	
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**
Reliability	Delivery Performance to Customer Request Date Fill Rate
Responsiveness	None Identified
Flexibility	None Identified
Cost	None Identified
Assets	Finished Goods Inventory Days of Supply
Best Practices	**Features**
Plans which do not violate business rules are communicated openly and cross-functionally for execution	None Identified
Plans that violate business rules (eg Joint Service Agreements) are addressed cross-functionally, considering total business impacts (revenue, cost, quality, customer service, etc.)	None Identified
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
Specific changes to the plan are agreed to cross-functionally, according to defined business rules	None Identified

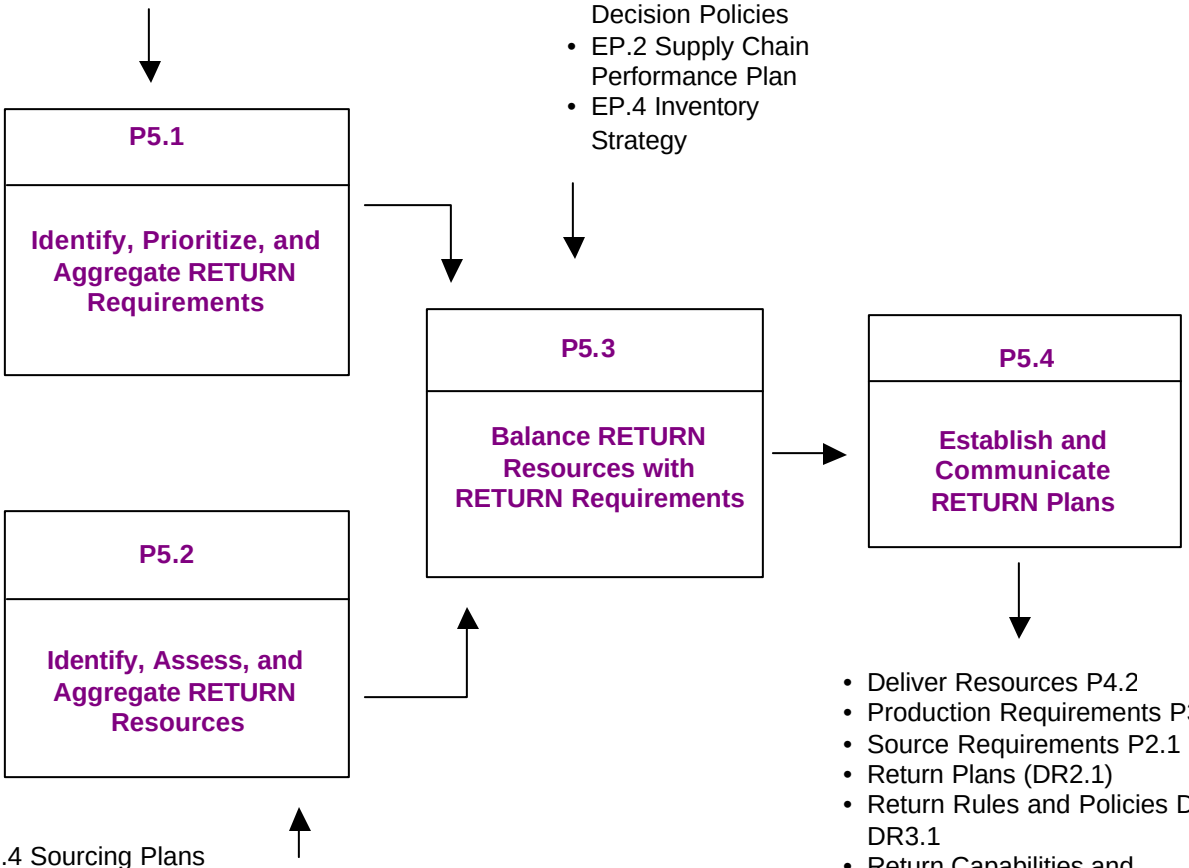
Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Delivery Plans	P1.2, P2.1, P3.1			D1.3, D2.3, D3.3
Stocking Requirements				D4.1

P5: Plan RETURN

- Projections, Revised Assumptions
- Contractual Obligations
- (EP.3) Planning Data
- (EP.9) Revised Aggregate Forecast and
- (D1, D2, D3) Actual Sales History
- (DR1.1, DR2.1, DR3.1) Historical Return Rates
- (ER.1) Business Rules
- (ER.8) Regulatory Requirements

- EP.1 Planning Decision Policies
- EP.2 Supply Chain Performance Plan
- EP.4 Inventory Strategy



- Deliver Resources P4.2
- Production Requirements P3.1
- Source Requirements P2.1
- Return Plans (DR2.1)
- Return Rules and Policies DR1.1, DR3.1
- Return Capabilities and Constraints DR1.1, DR3.1
- Return Plan Schedule DR1.1, DR2.3, DR3.1
- Process Procedures ER.2

- P2.4 Sourcing Plans
- P3.4 Make Plans / Overhaul and Rehab Capabilities
- P4.4 Delivery Plans
- EP.3 Planning Data
- (EP.5, EP.6) Projected & External Production Capacity, Revised Capital Plan, Outsource Plan
- EP.8 Regulatory Requirements
- EP.9 Budget Constraints
- (DR2.3, DR2.4) Return Inventory Transfer Data
- ER.1 Business Rules
- ER.2 Capabilities of the Return Processes
- ER.3 Data & Return Capabilities
- ER.4 Return Inventory Targets
- ER.5 Asset Return Capabilities
- ER.6 Return Transportation Guidelines, Policies, & Agreements
- ER.7 Return Process Workflow Definitions & Policies
- ER.8 Regulatory Requirements

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Process Element: Plan RETURN	Process Element Number: P5
Process Element Definition	
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 "rotable" products that are refurbished for reissue to customers.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	RETURN product velocity (movement through the process)
Flexibility	Ability to augment RETURN capacity rapidly
Costs	None Identified
Assets	RETURN assets utilization
Best Practices	**Features**
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.
Planning and Forecasting Outsourced RETURN process	Collaborative planning and forecasting with RETURN outsourcing partners (3PL, reverse drop shippers, etc.)

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Process Element :Identify, Assess, and Aggregate Return Requirements	Process Element Number: P5.1
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
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. (This is a retail-centric definition. My background is A&D.
Use Historical Based Return Rate Forecasts	Use historical return data to determine an historical return rate for individual products and/or for product groups and then apply these return rates against both forecasted sales and actual sales. The historical return data can also include statistics regarding the latency time between the sale (delivery date) and the return authorization request.

Inputs	Plan	Source	Make	Deliver	Return
Planning Data (incl. data from CRM or sales return system)	EP.3				
Revised Aggregate Forecast and Projections, Revised Assumptions	EP.9				
Projections	Marketing, Sales, Product Management/ Engineering				
Revised Assumptions	Marketing, Sales, Product Management/ Engineering				
Contractual Obligations	Marketing, Sales, Legal				
Overhaul and Rehab Plans (Applies to the A&D situation)	Marketing, Sales, P3 (As pertains to planning overhaul/ refurbishment ops)				
Historical Return Rates					DR1.1, DR2.1, DR3.1

Business Rules					ER.1
Regulatory Requirements					ER.8

Outputs	Plan	Source	Make	Deliver	Return

Process Element: Identify, Assess, and Aggregate Return Resources	Process Element Number: P5.2
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
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.
Joint Service Agreements with Source suppliers to share responsibilities and costs of returns	Collaborative planning tools with the Source suppliers
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

Inputs	Plan	Source	Make	Deliver	Return
Sourcing Plans	P2.4				
Make Plans	P3.4				
Delivery Plans	P4.4				
Planning Data	EP.3				
Projected & External Production Capacity; Revised Capital Plan; Outsource Plan	EP.5 EP.6				
Regulatory Requirements	EP.8				
Budget Constraints	EP.9				
Return Inventory Transfer Data					DR2.3, DR2.4
Business Rules					ER.1
Capabilities of the Return Processes					ER.2
Data & Return Capabilities					ER.3
Return Inventory Targets					ER.4
Asset Return Capabilities					ER.5
Return Transportation Guidelines, Policies, & Agreements					ER.6
Return Process Workflow Definition & Policies					ER.7
Regulatory Requirements					ER.8

Outputs	Plan	Source	Make	Deliver	Return

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Process Element: Balance Return Resources with Return Requirements	Process Element Number: P5.3
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
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.
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

Inputs	Plan	Source	Make	Deliver	Return
Planning Decision Policies	EP.1				
Supply Chain Performance Plan	EP.2				
Inventory Strategy (incl. restocking strategy)	EP.4				

Outputs	Plan	Source	Make	Deliver	Return

Process Element: Establish and Communicate Return Plans	Process Element Number: P5.4
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
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

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Deliver Resources	P4.2				
Production Requirements	P3.1				
Source Requirements	P2.1				
Return Plans					DR2.1
Return Rules and Policies					DR1.1, DR3.1
Return Capabilities and Constraints					DR1.2, DR3.2
Return Plan Schedule					DR1.2, DR2.3, DR3.2
Process Procedures					ER.2

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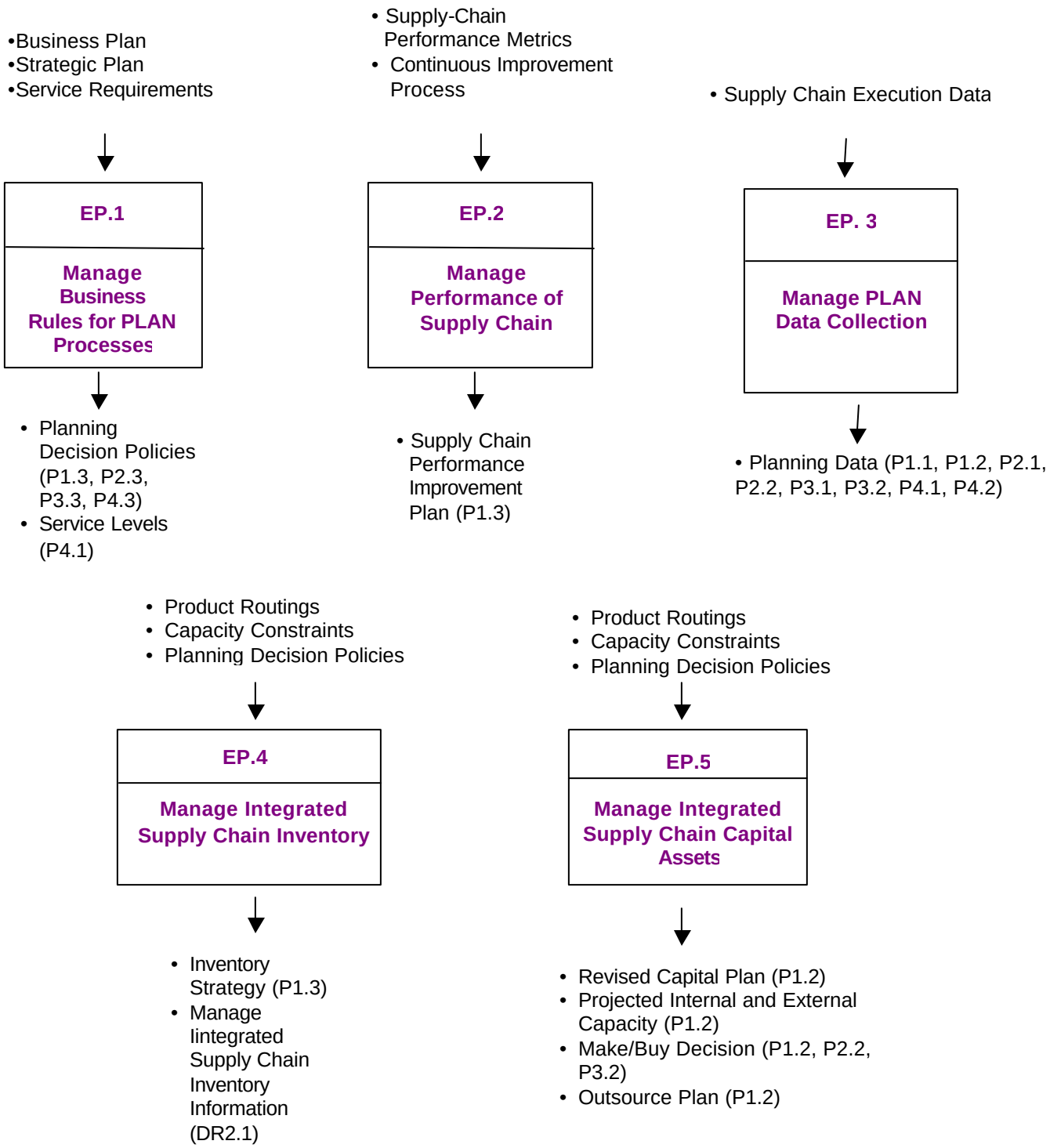
EP: Enable Plan



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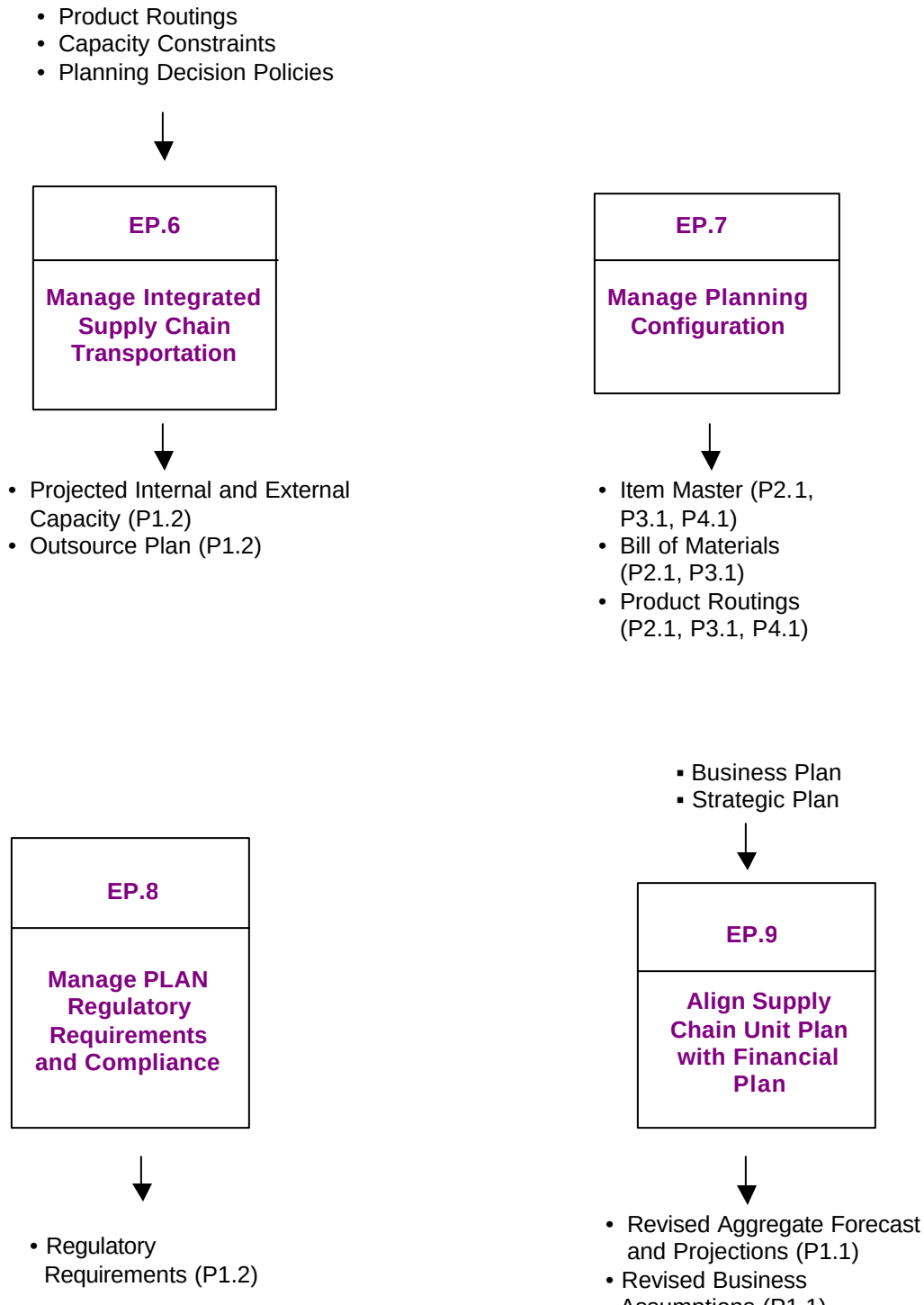
EP: Enable Plan



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Enable Process: Manage Business Rules for PLAN Processes	Process Number: EP.1

Enable Process Definition

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
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	Total Supply Chain Costs
Assets	None Identified
Best Practices	**Features**
Integrated business and supply chain planning processes where cross-functional input is leveraged to set business rules.	Supply Chain performance dashboard capability.

Inputs	Plan	Source	Make	Deliver
Business Plan				
Strategic Plan				
Service Requirements				

Outputs	Plan	Source	Make	Deliver
Planning Decision Policies	P1.3, P2.3, P3.3, P4.3			
Service Levels	P4.1			

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Enable Process: Manage Performance of Supply Chain	Process Number: EP.2
Enable Process Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	Total Supply Chain Costs
Assets	None identified
Best Practices	**Features**
Reliable Continuous Improvement Process and Methodology.	None Identified
Efficient and effective benchmarking process leveraging cross industry metrics and definitions.	None Identified
Sound Project Management Process and Methodology.	None Identified

Inputs	Plan	Source	Make	Deliver
Supply-Chain Performance Metrics				
Continuous Improvement Process				

Outputs	Plan	Source	Make	Deliver
Supply Chain Performance Improvement Plan	P1.3			

Enable Process: Manage PLAN Data Collection	Process Number: EP.3
Enable Process Definition	
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.	
Performance Attributes	**Metric**
Reliability	None identified
Responsiveness	None identified
Flexibility	None Identified
Cost	Total Supply Chain Costs
Assets	None Identified
Best Practices	**Features**
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.
Collaborative Planning – Planning information (POS information, Demand History, Forecast, Production Schedule etc.) is shared in between suppliers, manufacturers, service providers and customers.	Modern supply chain planning systems and communication technologies (XML, web enabled EDI) as well as newly defined standards (eg CPFR, eBXML, Rosettanet) supports the real-time information exchange in between the business community.
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.

Inputs	Plan	Source	Make	Deliver
Supply Chain Execution Data				

Outputs	Plan	Source	Make	Deliver
Planning Data	P1.1, P1.2, P2.1, P2.2, P3.1, P3.2, P4.1, P4.2			

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Enable Process: Manage Integrated Supply Chain Inventory	Process Number: EP.4

Enable Process Definition
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
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	Total Supply Chain Costs
Assets	None Identified
Best Practices	**Features**
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.

Inputs	Plan	Source	Make	Deliver
Product Routings				
Capacity Constraints				
Planning Decision Policies				

Outputs	Plan	Source	Make	Deliver	Return
Inventory Strategy	P1.3				
Manage Iintegrated Supply Chain Inventory Information					DR2.1

Enable Process: Manage Integrated Supply Chain Capital Assets	Process Number: EP.5

Enable Process Definition
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
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	Total Supply Chain Costs
Assets	None Identified
Best Practices	**Features**
Use of Cross Functional Teams to execute the process of developing Long-Term Capacity and Resource Plans.	None Identified
Alignment of strategic and business plans with long-term capacity and resource planning.	None Identified
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.

Inputs	Plan	Source	Make	Deliver
Product Routings				
Capacity Constraints				
Planning Decision Policies				

Outputs	Plan	Source	Make	Deliver
Revised Capital Plan	P1.2			
Projected Internal and External Capacity	P1.2			
Make/Buy Decision	P1.2, P2.2, P3.2			
Outsource Plan	P1.2			

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Enable Process: Manage Integrated Supply Chain Transportation	Process Number: EP.6

Enable Process Definition
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
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	Total Supply Chain Costs
Assets	None Identified
Best Practices	**Features**
Use of Cross Functional Teams to execute the process of developing Long-Term Capacity and Resource Plans.	None Identified
Alignment of strategic and business plans with long-term capacity and resource planning	None Identified
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.

Inputs	Plan	Source	Make	Deliver
Product Routings				
Capacity Constraints				
Planning Decision Policies				

Outputs	Plan	Source	Make	Deliver
Projected Internal and External Capacity	P1.2			
Outsource Plan	P1.2			

Enable Process: Manage Planning Configuration	Process Number: EP.7

Enable Process Definition

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
Reliability	Forecast Accuracy
Responsiveness	None Identified
Flexibility	None Identified
Cost	Total Supply Chain Costs
Assets	Return on Assets
Best Practices	**Features**
ABC Classification	None Identified
SKU Rationalization	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
New Items Introductions are part of the Sales and Operations Planning Process at the General Management Business Team Level	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Item Master	P2.1, P3.1, P4.1				
Bill of Materials	P2.1, P3.1				
Product Routings	P2.1, P3.1, P4.1				

Enable Process: Manage PLAN Regulatory Requirements and Compliance	Process Number: EP.8
Enable Process Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	Total Supply Chain Costs
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Regulatory Requirements	P1.2				

Enable Process: Align Supply Chain Unit Plan with Financial Plan	Process Number: EP.9

Enable Process Definition
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
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	Total Supply Chain Cost
Assets	None Identified
Best Practices	**Features**
Strategic Sales and Operations Planning process in place and managed at the executive level.	None Identified
A Re-planning process links the supply chain operation with the Business Strategy and the Marketing Strategy.	None Identified
A Re-planning process exists in multi-levels of the Supply Chain between business enterprises.	Business to business internet capability to share common data.

Inputs	Plan	Source	Make	Deliver
Business Plan				
Strategic Plan				

Outputs	Plan	Source	Make	Deliver
Revised Aggregate Forecast and Projections	P1.1			
Revised Business Assumptions	P1.1			

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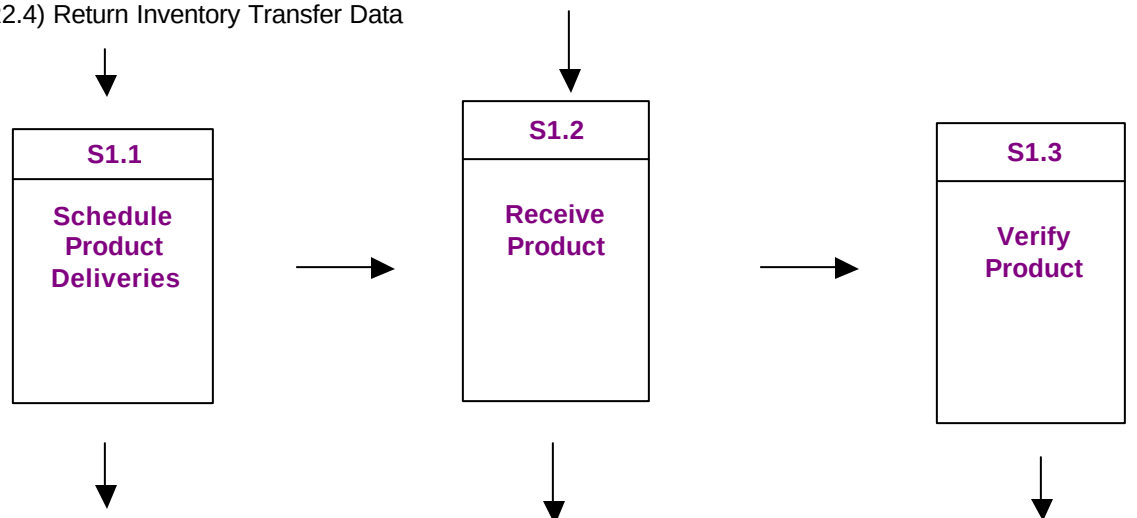
SOURCE

S1: Source Stocked Product

- (P2.4) Sourcing Plans
- (ES.2) Source Execution Data
- (ES.6) Logistics Selection
- (M1.1, M2.1, M3.2) Production Schedule
- (M1.2, M2.2, M3.3, D1.3) Replenishment Signals
- (DR2.4) Return Inventory Transfer Data

- (Supplier) Sourced Products
- (DR2.4) MRO Products



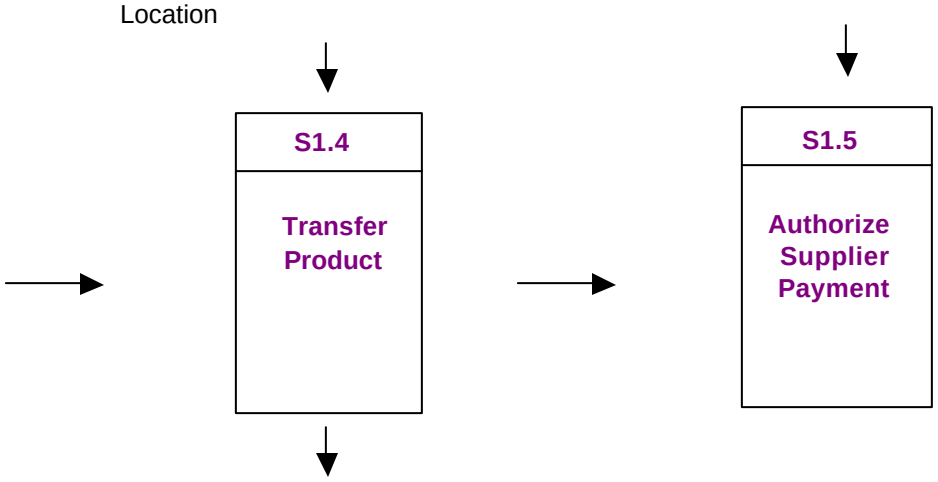
- Procurement Signal (Supplier)
- Sourced Product on Order (P2.2), (ES.9)
- Scheduled Receipts (M1.1, M2.1, M3.2, D1.8, D4.2)

- Receipt Verification (ES.1, ES.2, ES.6 ES.8)

- Receipt Verification (ES.1, ES.2)

- (M) (D) Product Pull Signals
- (ES.4) Product Inventory Location
- (EM) WIP Inventory Location
- (ED) Finished Goods Inventory Location

- (ES.9) Payment Terms



- Inventory Availability (P2.2, ES.4, M1.2, M2.2, M3.3, D1.8, D4.2)
- Daily Replenishment Requirements (D4.1)
- Loaded Cart (D4.4)

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Process Category: Source Stocked Product	Process Number: S1
Process Category Definition	
The procurement, delivery, receipt and transfer of raw material items, subassemblies, product and or services.	
Performance Attributes	**Metric**
Reliability	% Orders/lines processed complete
Responsiveness	Total Source Cycle Time to Completion
Flexibility	Time and Cost related to Expediting the Sourcing Processes of Procurement, Delivery, Receiving and Transfer.
Cost	Product Acquisition Costs
Assets	Inventory DOS
Best Practices	**Features**
Joint Service Agreements Alliance and Leverage agreements	None Identified

Process Element: Schedule Product Deliveries	Process Element Number: S1.1
Process Element Definition	
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**
Reliability	% Schedules Generated within Supplier's Lead Time % Schedules Changed within Supplier's Lead Time
Responsiveness	Average Release Cycle of Changes
Flexibility	Average Days per Schedule Change Average Days per Engineering Change
Cost	Product Management and Planning Costs as a % of Product Acquisitions Costs
Assets	None Identified
Best Practices	**Features**
Utilize EDI transactions to reduce cycle time and costs	EDI interface for 830, 850, 856 & 862 transactions
VMI agreements allow suppliers to manage (replenish) inventory	Supplier managed inventories with scheduling interfaces to external supplier systems
Mechanical (Kanban) pull signals are used to notify suppliers of the need to deliver product	Electronic Kanban support
Consignment agreements are used to reduce assets and cycle time while increasing the availability of critical items	Consignment inventory management
Advanced ship notices allow for tight synchronization between SOURCE and MAKE processes	Blanket order support with scheduling interfaces to external supplier systems

Inputs	Plan	Source	Make	Deliver	Return
Sourcing Plans	P2.4				
Source Execution Data		ES.2			
Logistics Selection		ES.6			
Production Schedule			M1.1, M2.1, M3.2		
Replenishment Signals			M1.2, M2.2, M3.3	D1.3	
Return Inventory Transfer Data					DR2.4

Outputs	Plan	Source	Make	Deliver	Return
Procurement Signal (Supplier)					
Sourced Product on Order	P2.2	ES.9			
Scheduled Receipts			M1.1, M2.1, M3.2	D1.8, D4.2	

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Process Element: Receive Product	Process Element Number: S1.2
Process Element Definition	
The process and associated activities of receiving product to contract requirements.	
Performance Attributes	**Metric**
Reliability	% Orders/ lines received damage free % Orders/ lines received complete % Orders/ lines received on-time to demand requirement % Orders/ lines received with correct shipping documents
Responsiveness	Receiving Cycle Time
Flexibility	% Receipts Received without Item and Quantity Verification
Cost	Receiving costs as a % of Product Acquisition Costs
Assets	None Identified
Best Practices	**Features**
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	Bar code interface for data collection devices Generate bar coded receiving documents
Deliveries are balanced throughout each working day and throughout the week	None Identified
Supplier delivers directly to point of use – (dock to line or end destination)	Electronic Tag tracking to Point of Use (POU) destination

Inputs	Plan	Source	Make	Deliver	Return
(Supplier) Sourced Products					
MRO Products					DR2.4

Outputs	Plan	Source	Make	Deliver	Return
Receipt Verification		ES.1, ES.2, ES.6, ES.8			

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Process Element: Verify Product	Process Element Number: S1.3
Process Element Definition	
The process and actions required determining product conformance to requirements and criteria.	
Performance Attributes	**Metric**
Reliability	% Orders / line received defect free
Responsiveness	Verification Cycle Time
Flexibility	% Receipts Received Without Quality Verification
Cost	Verification costs as a % of Product Acquisition Costs
Assets	None Identified
Best Practices	**Features**
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	Bar code interface for data collection devices Generate bar coded receiving documents
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
Supplier replaces defective material at customer's facility with good product as required.	Electronic Tag tracking to Point of Use (POU) destination

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Receipt Verification		ES.1, ES.2			

Process Element: Transfer Product	Process Element Number: S1.4
Process Element Definition	
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**
Reliability	% Product transferred damage free % Product transferred complete % Product transferred on-time to demand requirement % Product transferred without transaction errors
Responsiveness	Transfer Cycle Time
Flexibility	Time and Cost Reduction related to Expediting the Transfer Process.
Cost	Transfer & Product storage costs as a % of Product Acquisition Costs
Assets	Inventory DOS
Best Practices	**Features**
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 Organization	None Identified

Inputs	Plan	Source	Make	Deliver
Product Pull Signals			M	D
Product Inventory Location		ES.4		
WIP Inventory Location			EM	
Finished Goods Inventory Location				ED

Outputs	Plan	Source	Make	Deliver
Inventory Availability	P2.2	ES.4	M1.2, M2.2, M3.3	D1.8, D4.2
Daily Replenishment Requirements				D4.1
Loaded Cart				D4.4

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Process Element: Authorize Supplier Payment	Process Element Number: S1.5
Process Element Definition	
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**
Reliability	% Invoices processed without issues and/or errors
Responsiveness	Payment Cycle Time.
Flexibility	% Invoice Receipts and Payments Generated via EDI.
Cost	Cost per invoice.
Assets	None Identified
Best Practices	**Features**
Pay on Receipt	Electronic Invoice Processing

Inputs	Plan	Source	Make	Deliver	Return
Payment Terms		ES.9			

Outputs	Plan	Source	Make	Deliver	Return

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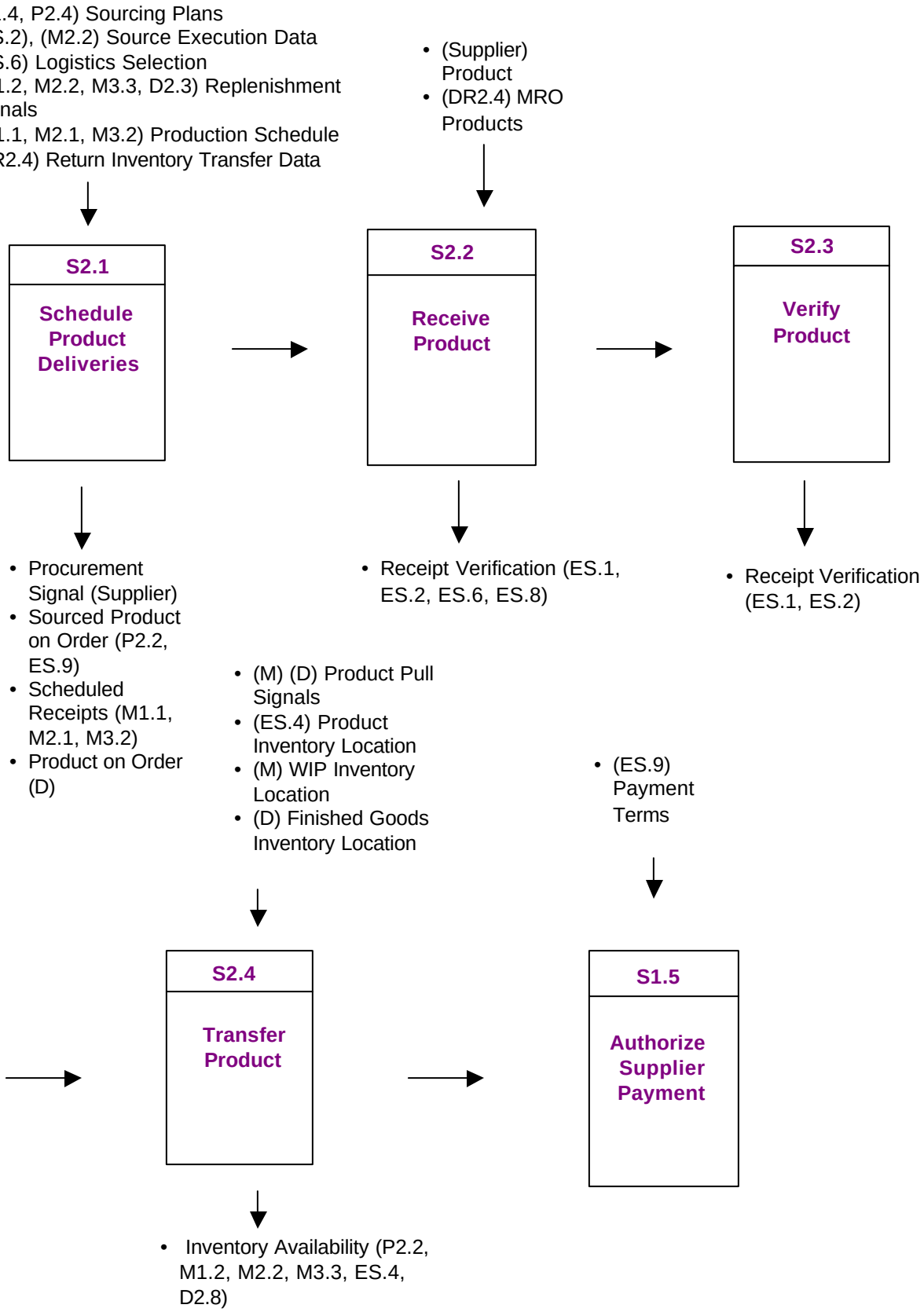
S2: Source Make-to-Order Product



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Process Category: Source Make-to-Order Product	Process Number: S2
Process Category Definition	
The procurement and delivery of product that is built to a specific design or configured based on the requirements of a particular customer order.	
Performance Attributes	**Metric**
Reliability	% Orders/lines processed complete
Responsiveness	Total Source Cycle Time to Completion
Flexibility	Time and Cost related to Expediting the Sourcing Processes of Procurement, Delivery, Receiving and Transfer.
Cost	Product Acquisition Costs
Assets	Inventory DOS.
Best Practices	**Features**
Joint Service Agreements	None Identified
Automated Statistical Process Control (SPC)	None Identified

Process Element: Schedule Product Deliveries	Process Element Number: S2.1
Process Element Definition	
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**
Reliability	% Schedules generated within Supplier's Lead Time % Schedules changed within Supplier's Lead Time
Responsiveness	Average Release Cycle of Changes
Flexibility	Average days per Schedule Change Average days per Engineering Change
Cost	Product Management and Planning Costs as a % of Product Acquisition Costs
Assets	None Identified
Best Practices	**Features**
Utilize EDI transactions to reduce cycle time and costs	EDI interface for 830, 850, 856 & 862 transactions
VMI agreements allow suppliers to manage (replenish) inventory	Supplier managed inventories with scheduling interfaces to external supplier systems
Mechanical (Kanban) pull signals are used to notify suppliers of the need to deliver product	Electronic Kanban support
Consignment agreements are used to reduce assets and cycle time while increasing the availability of critical items	Consignment inventory management
Advanced ship notices allow for tight synchronization between SOURCE and MAKE processes	Blanket order support with scheduling interfaces to external supplier systems

Inputs	Plan	Source	Make	Deliver	Return
Sourcing Plans	P1.4, P2.4				
Source Execution Data		ES.2	M2.2		
Logistics Selection			ES.6		
Replenishment Signals			M1.2, M2.2, M3.3	D2.3	
Production Schedule			M1.1, M2.1, M3.2		
Return Inventory Transfer Data					DR2.4

Outputs	Plan	Source	Make	Deliver	Return
Procurement Signal (Supplier)					
Sourced Product on Order	P2.2	ES.9			
Scheduled Receipts			M1.1, M2.1, M3.2		
Product on Order				D	

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Process Element: Receive Product	Process Element Number: S2.2
Process Element Definition	
The process and associated activities of receiving product to contract requirements.	
Performance Attributes	**Metric**
Reliability	% Orders/ lines received damage free % Orders/ lines received complete % Orders/ lines received on-time to demand requirement % Orders/ lines received with correct shipping documents
Responsiveness	Receiving Cycle Time.
Flexibility	% Receipts Received without Item and Quantity Verification
Cost	Receiving costs as a % of Product Acquisition Costs
Assets	None Identified
Best Practices	**Features**
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	Bar code interface for data collection devices Generate bar coded receiving documents
Deliveries are balanced throughout each working day and throughout the week	None Identified
Supplier delivers directly to point of use – (dock to line or end destination)	Electronic Tag tracking to Point of Use (POU) destination

Inputs	Plan	Source	Make	Deliver	Return
(Supplier) Product					
MRO Products					DR2.4

Outputs	Plan	Source	Make	Deliver	Return
Receipt Verification		ES.1, ES.2, ES.6, ES.8			

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Process Element: Verify Product	Process Element Number: S2.3
Process Element Definition	
The process and actions required determining product conformance to requirements and criteria.	
Performance Attributes	**Metric**
Reliability	% Orders / lines received defect free
Responsiveness	Verification Cycle Time
Flexibility	% Receipts Received Without Quality Verification
Cost	Verification costs as a % of Product Acquisition Costs
Assets	None Identified
Best Practices	**Features**
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	Bar code interface for data collection devices Generate bar coded receiving documents
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
Supplier replaces defective material at customer's facility with good product as required.	Electronic Tag tracking to Point of Use (POU) destination

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Receipt Verification		ES.1, ES.2		

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Process Element: Transfer Product	Process Element Number: S2.4
Process Element Definition	
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**
Reliability	% Product transferred damage free % Product transferred complete % Product transferred on-time to demand requirement % Product transferred without transaction errors
Responsiveness	Transfer Cycle Time
Flexibility	Time and/or Cost Reduction related to Expediting the Transfer Process.
Cost	Transfer & Product storage costs as a % of Product Acquisition Costs
Assets	Inventory DOS
Best Practices	**Features**
Drive deliveries directly to stock or point-of-use in manufacturing to reduce costs and cycle time Capability transfer to customer	Pay on receipt Specify delivery location and time (to the minute) Specify delivery sequence

Inputs	Plan	Source	Make	Deliver
Product Pull Signals			M	D
Product Inventory Location		ES.4		
WIP Inventory Location			M	
Finished Goods Inventory Location				D

Outputs	Plan	Source	Make	Deliver
Inventory Availability	P2.2.	ES.4	M1.2, M2.2, M3.3	D2.8

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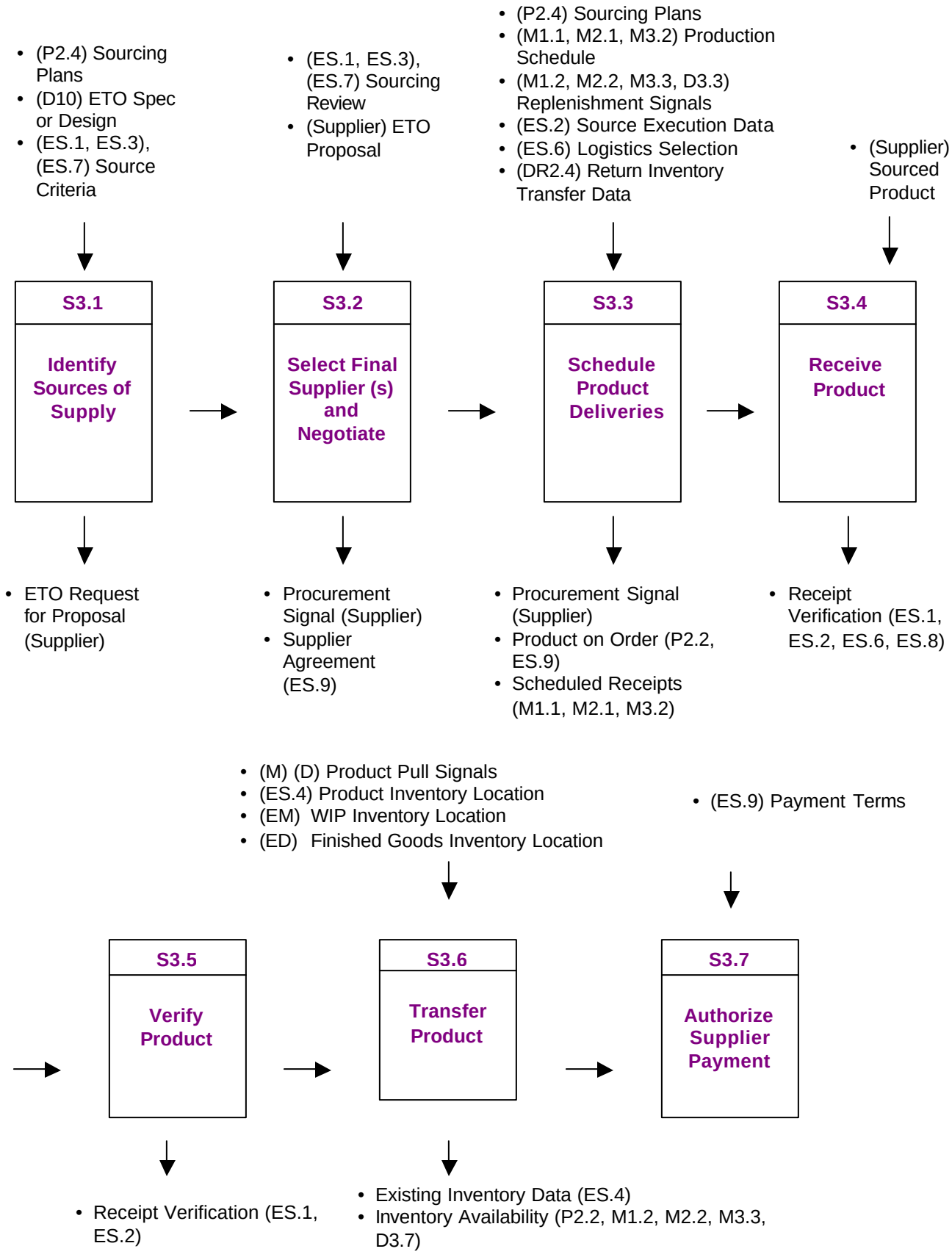
Process Element: Authorize Supplier Payment	Process Element Number: S2.5
Process Element Definition	
The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.	
Performance Attributes	**Metric**
Reliability	% Invoices processed without issues and/or errors
Responsiveness	Payment Cycle Time.
Flexibility	% Invoice Receipts and Payments Generated via EDI.
Cost	Cost per invoice.
Assets	None Identified
Best Practices	**Features**
Pay on Receipt	Electronic Invoice Processing

Inputs	Plan	Source	Make	Deliver
Payment Terms		ES.9		

Outputs	Plan	Source	Make	Deliver

S3: Source Engineer-to-Order Product



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Process Category: Source Engineer-to-Order Product	Process Number: S3
Process Category Definition	
The negotiation, procurement and delivery of engineer-to-order assemblies or specialized product or services that are designed and built based on the requirements or specifications of a particular customer order or contract.	
Performance Attributes	**Metric**
Reliability	% Orders/lines processed complete
Responsiveness	Total Source Cycle Time to Completion
Flexibility	Time and Cost related to Expediting the Sourcing Processes of Procurement, Delivery, Receiving and Transfer.
Cost	Product Acquisition Costs
Assets	Inventory DOS Value of assets provided by service provider(cost avoidance)
Best Practices	**Features**
Joint Service Agreements	None Identified

Process Element: Identify Sources of Supply	Process Element Number: S3.1
Process Element Definition	
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**
Reliability	% Potential suppliers selected which become qualified % Qualified suppliers which meet defined requirements
Responsiveness	Source Identification Cycle Time Source Qualification Cycle Time
Flexibility	Time and/or Cost reduction related to Source Identification
Cost	Product Process Engineering as a % of Product Acquisition Costs
Assets	Value of assets provided by service provider (cost avoidance)
Best Practices	**Features**
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
Concurrent engineering is used to tightly link sourcing into the product development process Make/Buy Decision Process (Outsourcing vs. In sourcing)	None Identified
Supplier development programs are used to get local suppliers to invest in developing new technologies	None Identified

Inputs	Plan	Source	Make	Deliver
Sourcing Plans	P2.4			
ETO Spec or Design				D10
Source Criteria		ES.1, ES.3, ES.7		

Outputs	Plan	Source	Make	Deliver
ETO Request for Proposal (Supplier)				

Process Element: Select Final Supplier(s) and Negotiate	Process Element Number: S3.2
Process Element Definition	
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**
Reliability	% Supplier contracts negotiated meeting target terms and conditions for quality, delivery, flexibility and cost
Responsiveness	Source Selection Cycle Time
Flexibility	% Single and/or Sole Source Selections
Cost	Sourcing Costs as a % of Product Acquisitions Costs
Assets	None Identified
Best Practices	**Features**
Electronic data interchange is used to send RFQs and 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
Supplier certification programs can reduce the cycle time for certifying existing suppliers to provide new technologies	None Identified
Utilize concurrent engineering with suppliers to allow them to provide engineering and product performance test data	None Identified
On line document management and automated supplier approval processes can reduce the cycle time and costs associated with managing supplier evaluations On-line availability to supplier financials	None Identified

Inputs	Plan	Source	Make	Deliver
Sourcing Review		ES.1, ES.3, ES.7		
(Supplier) ETO Proposal				

Outputs	Plan	Source	Make	Deliver
Procurement Signal (Supplier)				
Supplier Agreement		ES.9		

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Process Element: Schedule Product Deliveries	Process Element Number: S3.3
Process Element Definition	
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**
Reliability	% Schedules generated within Supplier's Lead time % Schedules changed within Supplier's Lead time
Responsiveness	Average Release Cycle of Changes
Flexibility	Average days per Schedule Change Average days per Engineering Change
Cost	Product Management and Planning Costs as a % of Product Acquisition Costs
Assets	None Identified
Best Practices	**Features**
Utilize EDI transactions to reduce cycle time and costs	EDI interface for 830, 850, 856 & 862 transactions
VMI agreements allow suppliers to manage (replenish) inventory	Supplier managed inventories with scheduling interfaces to external supplier systems
Mechanical (Kanban) pull signals are used to notify suppliers of the need to deliver product	Electronic Kanban support
Consignment agreements are used to reduce assets and cycle time while increasing the availability of critical items	Consignment inventory management
Advanced ship notices allow for tight synchronization between SOURCE and MAKE processes	Blanket order support with scheduling interfaces to external supplier systems

Inputs	Plan	Source	Make	Deliver	Return
Sourcing Plans	P2.4				
Production Schedule			M1.1, M2.1, M3.2		
Replenishment Signals			M1.2, M2.2, M3.3	D3.3	
Source Execution Data		ES.2			
Logistics Selection		ES.6			
Return Inventory Transfer Data					DR2.4

Outputs	Plan	Source	Make	Deliver	Return
Procurement Signal (Supplier)					
Product on Order	P2.2	ES.9			
Scheduled Receipts			M1.1, M2.1, M3.2		

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Process Element: Receive Product	Process Element Number: S3.4
Process Element Definition	
The process and associated activities of receiving product to contract requirements.	
Performance Attributes	**Metric**
Reliability	% Orders/ lines received damage free % Orders/ lines received complete % Orders/ lines received on-time to demand requirement % Orders/ lines received with correct shipping documents
Responsiveness	Receiving Cycle Time
Flexibility	% Receipts Received without Item and Quantity Verification.
Cost	Receiving costs as a % of Product Acquisition Costs
Assets	None Identified
Best Practices	**Features**
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	Bar code interface for data collection devices Generate bar coded receiving documents
Deliveries are balanced throughout each working day and throughout the week	None Identified
Supplier delivers directly to point of use – (dock to line or end destination)	Electronic Tag tracking to Point of Use (POU) destination

Inputs	Plan	Source	Make	Deliver
(Supplier) Sourced Product				

Outputs	Plan	Source	Make	Deliver
Receipt Verification		ES.1, ES.2, ES.6, ES.8		

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Process Element: Verify Product	Process Element Number: S3.5
Process Element Definition	
The process and actions required determining product conformance to requirements and criteria.	
Performance Attributes	**Metric**
Reliability	% Orders / lines received defect free
Responsiveness	Verification Cycle Time.
Flexibility	% Receipts Received Without Quality Verification
Cost	Verification costs as a % of Product Acquisition Costs
Assets	None Identified
Best Practices	**Features**
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	Bar code interface for data collection devices Generate bar coded receiving documents
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
Supplier replaces defective material at customer's facility with good product as required.	Electronic Tag tracking to Point of Use (POU) destination

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Receipt Verification		ES.1, ES.2		

Process Element: Transfer Product	Process Element Number: S3.6
Process Element Definition	
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**
Reliability	% Product transferred damage free % Product transferred complete % Product transferred on-time to demand requirement % Product transferred without transaction errors
Responsiveness	Transfer Cycle Time.
Flexibility	Time and/or Cost Reduction related to Expediting the Transfer Process.
Cost	Transfer & Product storage costs as a % of Product Acquisition Costs
Assets	Inventory DOS
Best Practices	**Features**
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 organization	None Identified

Inputs	Plan	Source	Make	Deliver
Product Pull Signals			M	D
Product Inventory Location		ES.4		
WIP Inventory Location			EM	
Finished Goods Inventory Location				ED

Outputs	Plan	Source	Make	Deliver
Existing Inventory Data		ES.4		
Inventory Availability	P2.2		M1.2, M2.2, M3.3	D3.7

Process Element: Authorize Supplier Payment	Process Element Number: S3.7
Process Element Definition	
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**
Reliability	% Invoices Processed without Issues and/or Errors
Responsiveness	Payment Cycle Time.
Flexibility	% Invoice Receipts and Payments Generated via EDI.
Cost	Cost per invoice.
Assets	None Identified
Best Practices	**Features**
Pay on Receipt	Electronic Invoice Processing

Inputs	Plan	Source	Make	Deliver
Payment Terms		ES.9		

Outputs	Plan	Source	Make	Deliver

ES: Enable Source

- (S1.2, S1.3, S2.2), (S2.3, S3.4, S3.5) Receipt Verification
- (ES.7) Manage Supplier Network

ES.1

Manage Sourcing Business Rules

- Manage Supplier Network (ES.7)
- Identify Source of Supply (S3.1, S3.2)

- (S1.2, S1.3, S2.2), (S2.3, S3.4, S3.5) Receipt Verification
- (ES.7) Manage Supplier Network

ES.2

Assess Supplier Performance

- Maintain Source Data (ES.3)
- Manage Supplier Network (ES.7)
- Establish Source Plan (S1.1, S2.1, S3.3,)

- Plan Source
- Manage Supply Chain Inventory
- (ES.2) Quality & Delivery Performance
- (ES.7) Manage Supplier Network

ES.3

Maintain Source Data

- Manage Supplier Network (ES.7)
- Identify Source of Supply (S3.1, S3.2)
- Current Inventory Source Data

- Product Mix and Plans
- Supply Chain Plan
- Inventory and Order Rules
- Parts and Services Consumed
- (S1.4, S2.4, S3.6) Existing Inventory Data
- (SR2.2) Inventory Availability
- (SR2.2) Return Product Location

ES.4

Manage Product Inventory

- Product Inventory Location (S1.4, S2.4, S3.6)
- MRO Parts Availability
- Inventory Target Levels
- Supply Chain Performance
- Inventory Availability (SR2.3, SR2.4, SR2.5)

- (ES.8) Import/Export Requirements
- (ES.9) Supplier Agreement
- Parts and Services Consumed
- Deliver Capital Assets

ES.5

Manage Capital Assets

- Import/Export Requirements (ES.8)

- (ES.8) Contract Carrier Rates
- (S1.2, S2.2, S3.4) Receipt Verification

ES.6

Manage Incoming Product

- Logistics Selection (S1.1, S2.1, S3.3)

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ES: Enable Source

- (ES.1) Business Rules
- (ES.2) Supplier Performance
- (ES.3) Incoming Product
- (ES.9) Supplier Agreement

ES.7

Manage Supplier Network

- Business Rules (ES.1)
- Supplier Performance (ES.2)
- Incoming Product (ES.3)
- Supplier Agreement (ES.9)
- Identify Sources (S3.1, S3.2)

- (S1.2), S2.2, S3.4) Receipt History
- (ES.5) Manage Capital Assets
- Parts and Services Consumed

ES.8

Manage Import/Export Requirements

- Manage Capital Assets (ES.5)
- Manage Incoming Product (ES.6)
- Supplier Agreement (ES.9)

- (S3.2) Select Final Supplier & Negotiate
- (ES.7) Manage Supplier Network
- (S1.1, S2.1, S3.3) Schedule Product Deliveries
- (ES.8) Import/Export Requirements

ES.9

Manage Supplier Agreements

- Manage Capital Assets (ES.5)
- Manage Supplier Network (ES.7)
- Authorize Supplier Payment (S1.5, S2.5, S3.7)

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Enable Process: Manage Sourcing Business Rules	Process Number: ES.1
Enable Process Definition	
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**
Reliability	% Agreements Negotiated without error/change requirement % Orders placed without error The Degree & Frequency of Conformance to Business Rules that is achieved
Responsiveness	None Identified
Flexibility	End to End Cycle Time for Business Processes RP-PO Cycle Time Approval Cycle Time Policy Documentation & Approval Cycle Time
Cost	Cost of Process Documentation, Monitoring and Auditing Business Rules Cost of non-compliance to Business Rules
Assets	Assets as a % of cost to administer business rules
Best Practice	**Features**
Enterprise level policies/rules with local execution	Web based access to enterprise level business rules
Long term supplier agreements/partnerships	Electronic rules for business relationships and transactions
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
Enterprise level spend analysis	Web based access to current spend data available from enterprise to part level
Collaborative review and agreement of business rules prior to contract execution	Use of WEB enabled conferencing or meeting software for review
Electronic Sourcing and Negotiation	Business Rules for electronic sourcing process and hierarchy

Inputs	Plan	Source	Make	Deliver
Receipt Verification		S1.2, S1.3, S2.2, S2.3, S3.4, S3.5		
Manage Supplier Network		ES.7		

Outputs	Plan	Source	Make	Deliver
Manage Supplier Network		ES.7		
Identify Source of Supply		S3.1, S3.2		

Enable Process: Assess Supplier Performance	Process Number: ES.2
Enable Process Definition	
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**
Reliability	On-time delivery performance (required quantities, to dates required) Defective product (expressed as % or defective parts per million) Performance to requirements stated in contracts or service agreements Continuous improvement trends or patterns Business performance trends or patterns Frequency of personnel changes and related impacts Supplier Performance Rating Quality Improvement Productivity Improvement
Responsiveness	None Identified
Flexibility	The degree and frequency of demonstrated flexibility or responsiveness measured against defined criteria
Cost	Total cost to measure supply base performance as a % of revenue Total cost of nonconformance as a % of revenue Costs related to specific types of non-conformance
Assets	Assets as a % of Non-conformance Costs
Best Practice	**Features**
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
Supplier performance data is collected, analyzed and reported to suppliers online and real-time through extranet applications	Web based relational database / management application
Supplier "cost of nonconformance" data is collected, analyzed and used in performance reporting	Software application to automate data collection and reporting
Comparative analysis of supplier performance is used in sourcing decisions	Software application with data analysis capability
Suppliers are evaluated, selected and qualified with criteria matched to business requirements and competitive needs	None identified
Cost reduction and or cost avoidance are opportunities are identified, implemented and measured on a periodic basis	
Continuous Improvement and development is driven and measured through the performance review process	

Inputs	Plan	Source	Make	Deliver
Receipt Verification		S1.2, S1.3, S2.2, S2.3, S3.4, S3.5		
Manage Supplier Network		ES.7		

Outputs	Plan	Source	Make	Deliver
Maintain Source Data		ES.3		
Manage Supplier Network		ES.7		
Establish Source Plan		S1.1, S2.1, S3.3		

Enable Process: Maintain Source Data	Process Number: ES.3

Enable Process Definition

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
Reliability	Availability &Accuracy of supplier/source data Frequency of supplier/source data update feeds
Responsiveness	None Identified
Flexibility	Time to access supplier/source data as required to respond to need The degree of flexibility to access, collect, sort, update and analyze source data to enable rapid business decisions
Cost	Cost of maintaining data as a % of spend, % revenue
Assets	Assets as a % of cost to maintain data repository
Best Practice	**Features**
Data accessibility across the enterprise for visibility by discrete business units	Web based access to various levels of enterprise data
On demand access of supplier/source data	Web based access to current supplier/source data
Automated update of supplier performance information	None Identified
Supplier and material rationalization	Web based access to supplier/source data

Inputs	Plan	Source	Make	Deliver
Plan Source, Manage Supply Chain Inventory				
Quality & Delivery Performance		ES.2		
Manage Supplier Network		ES.7		

Outputs	Plan	Source	Make	Deliver
Current Inventory Source Data				
Manage Supplier Network		ES.7		
Identify Source of Supply		S3.1, S3.2		

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Enable Process: Manage Product Inventory	Process Number: ES.4
Enable Process Definition	
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**
Reliability	Fill Rate (% filled of an order)
Responsiveness	None Identified
Flexibility	Cycle Time required to move product to point of use
Cost	Inventory carrying cost Days of Supply (DOS) Inventory Value (measured in dollars)
Assets	Inventory Days of Supply
Best Practice	**Features**
Periodic review of metrics and strategy with comparisons to industry benchmarks	Real time view of data.
Real time data on current status.	Dynamic calculation of safety stock based on actual sales
Cycle Counting	None Identified
Supplier Managed Inventory	The supplier is responsible for maintaining inventory levels at the point of use. The software system verifies usage, receiving and payment functions.

Inputs	Plan	Source	Make	Deliver	Return
Product Mix and Plans, Supply Chain Plan, Inventory and Order Rules					
Existing Inventory Data		S1.4, S2.4, S3.6			
Parts and Services Consumed					

Outputs	Plan	Source	Make	Deliver	Return
Product Inventory Location		S1.4, S2.4, S3.6			
MRO Parts Availability					
Inventory Target Levels, Supply Chain Performance					
Inventory Availability					SR2.3, SR2.4, SR2.5

Enable Process: Manage Capital Assets	Process Number: ES.5
Enable Process Definition	
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**
Reliability	Unplanned Maintenance Downtime % of Total Production Time % Obsolete or Inactive Capital Assets
Responsiveness	None Identified
Flexibility	Mean Time to Repair Asset (Tooling & Equipment)
Cost	Cost of Damaged Capital Asset Cost of Obsolete Capital Asset Capital Asset Carrying Cost
Assets	Actual Asset Life Maintenance Cost as % of Replacement Value
Best Practice	**Features**
Removal of Obsolete Capital Assets	Automated Calculation of ABC Velocity Movement
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.
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 of the Supplier to assist in directing resources toward bottleneck functional areas.
Facility & Equipment Environmental / Safety Audit System	System software to list checklist items, report results of audit & forward actions to be taken

Inputs	Plan	Source	Make	Deliver
Import/Export Requirements		ES.8		
Supplier Agreement		ES.9		
Parts and Services Consumed				
Deliver Capital Assets				

Outputs	Plan	Source	Make	Deliver
Import/Export Requirements		ES.8		

Enable Process: Manage Incoming Product	Process Number: ES.6

Enable Process Definition

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
Reliability	Frequency of parameter updates Number of data sources for data collection
Responsiveness	None Identified
Flexibility	Speed at which parameters (eg, rates) are updated. Dock-to-Dock times (lane specific)
Cost	Data maintenance costs
Assets	Empty-to-loaded back-haul mile index Equipment utilization rates (hours) Equipment utilization rates (product contribution margin) Vehicle maintenance costs
Best Practice	**Features**
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 Appointment Scheduling for Pickup and Delivery of Customer Shipments Measurement of Carrier Performance for On-time Delivery and Completeness Real-time Optimized Shipment Method Selection (Air Parcel, Ground Parcel, LTL, etc.) Based on Customer Service Requirements Real-time Shipment Tracking, (via Internet) Electronic Manifest and Electronic Billing Automated Documentation for International Shipments Manage Information across 100% of shipments Capture and maintain mode specific data	Transportation Management System (TMS) Maintenance Management
Internet Pooling (Electronic brokerage of shipments	Rating & Routing
Back-haul trading exchange	Pooling

Inputs	Plan	Source	Make	Deliver
Contract Carrier Rates		ES.8		
Receipt Verification		S1.2, S2.2, S3.4		

Outputs	Plan	Source	Make	Deliver
Logistics Selection		S1.1, S2.1, S3.3		

Enable Process: Manage Supplier Network	Process Number: ES.7
Enable Process Definition	
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**
Reliability	Supplier Delivery Performance Percent Supplier Quality Performance Percent Supplier Price Performance Percent
Responsiveness	None Identified
Flexibility	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. Total Source Lead Time Total Delivery Time Terms and Conditions
Cost	Total Product Costs Total Delivery Costs Total Handling Costs
Assets	Value of assets provided by service provider (cost avoidance)
Best Practice	**Features**
Internet Exchanges that provide: Catalog hosting services allow suppliers to edit, review and publish their catalog content to the Exchange hosted catalog. Exchanges also offers value add services that help suppliers differentiate their content, optimize catalogs for maximum order volume as well as manage individual trading relationships with buyers. Spot Purchasing allows buyers to search the Exchange hosted catalog and compare the goods and services offered by multiple suppliers. Buyers can add items selected for purchase to their shopping cart. Suppliers are automatically notified of the purchases when the buyer 'checks-out' with the shopping cart. Buyer Auctions allow buyers to create and publish an auction for goods and services that they intend to purchase. Bids from multiple suppliers can then be compared to make an award decision. In this way, buyers can quickly identify new sources of supply and manage unexpected changes in demand. Seller Auctions allow sellers to create and publish an auction for goods or services that they intend to sell. The seller can review and compare bids from multiple buyers to make an award decision. Suppliers can easily manage excess capacity as well as maximize the value of obsolete or scrap materials. Transaction Delivery services allow buyers and suppliers to connect seamlessly to Exchanges to send and receive purchasing transactions securely over the Internet.	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.

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 Consignment Inventory programs	Consignment Inventory Management
Identification of suppliers who will participate in Kanban programs	Electronic Kanban Support
Identification of suppliers who will participate in procurement split (two or more suppliers sharing purchase requirements) programs	None Identified
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
On-line availability to supplier financials to determine potential supplier viability to be added to supplier network	Internet web sites for financial evaluation
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
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
Supplier certification programs can reduce the cycle time for initial certification of new suppliers or certifying existing suppliers that wish to provide new technologies	None Identified
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

Inputs	**Plan**	**Source**	**Make**	**Deliver**
Business Rules		ES.1		
Supplier Performance		ES.2		
Incoming Product		ES.3		
Supplier Agreement		ES.9		

Outputs	**Plan**	**Source**	**Make**	**Deliver**
Business Rules		ES.1		
Supplier Performance		ES.2		
Incoming Product		ES.3		
Supplier Agreement		ES.9		
Identify Sources		S3.1, S3.2		

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Enable Process: Manage Import/Export Requirements	Process Number: ES.8
Enable Process Definition	
The process of identifying and complying with import/export regulatory documentation and process standards set by external entities (eg, government).	
Performance Attributes	**Metric**
Reliability	Compliance with multi-country government regulations1 Minimized delays in-transit caused by customs intervention2
Responsiveness	None Identified
Flexibility	Customs clearance cycle time Export shipment processing time
Cost	Duty tax control Cost of compliance
Assets	None Identified
Best Practice	**Features**
Documents generated automatically during shipment preparation. Direct connection to customs clearance Direct Transfer of documents to Recipient and Forwarder	Electronic documentation submission via EDI and/or Internet
Assessing export/import requirements during time of product development/manufacture	Multi-country Export/Import documentation compliance
Ability to track component/sub-component manufacturing country of origin	Component/lot tracking (lot trace-ability)

Inputs	Plan	Source	Make	Deliver
Receipt History		S1.2, S2.2, S3.4		
Manage Capital Assets		ES.5		
Parts and Services Consumed				

Outputs	Plan	Source	Make	Deliver
Manage Capital Assets		ES.5		
Manage Incoming Product		ES.6		
Supplier Agreement		ES.9		

Enable Process: Manage Supplier Agreements	Process Number: ES.9

Enable Process Definition

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
Reliability	Supplier Delivery Performance Percent Supplier Quality Performance Percent Supplier Price Performance Percent Re-negotiation Cycle Time Volume of Amendment compared to total contracts
Responsiveness	None Identified
Flexibility	Degree and frequency that purchase orders/contract can be altered. Average length of contracts
Cost	Cost of managing Long Term Agreements as a % spent, % revenue Cost of managing All Contracts as a % spent, % revenue
Assets	Assets associated with the Management of Supplier Agreements as a %of Total Assets.
Best Practice	**Features**
Enterprise level policies/rules with local execution	Web based access to enterprise level business rules
Long term supplier agreements/partnerships Vendor Managed Inventory Agreements Fab & Hold Agreements Just-In-Time Agreements	Electronic rules for business relationships and transactions
Optimized Supply Chain Processes Optimized Supplier Count Supplier and Part Rationalization	Web based access to preferred and recommended suppliers, supplier performance data and spend data stratified by commodity, business unit/site, supplier, part type, process type
Enterprise level spend analysis	Web based access to current spend data available from enterprise to part level
Electronic Sourcing and Negotiation E-Business	Business Rules for electronic sourcing process and hierarchy

Inputs	Plan	Source	Make	Deliver
Select Final Supplier & Negotiate		S3.2		
Manage Supplier Network		ES.7		
Schedule Product Deliveries		S1.1, S2.1, S3.3		
Import/Export Requirements		ES.8		

Outputs	Plan	Source	Make	Deliver
Manage Capital Assets		ES.5		
Manage Supplier Network		ES.7		
Authorize Supplier Payment		S1.5, S2.5, S3.7		

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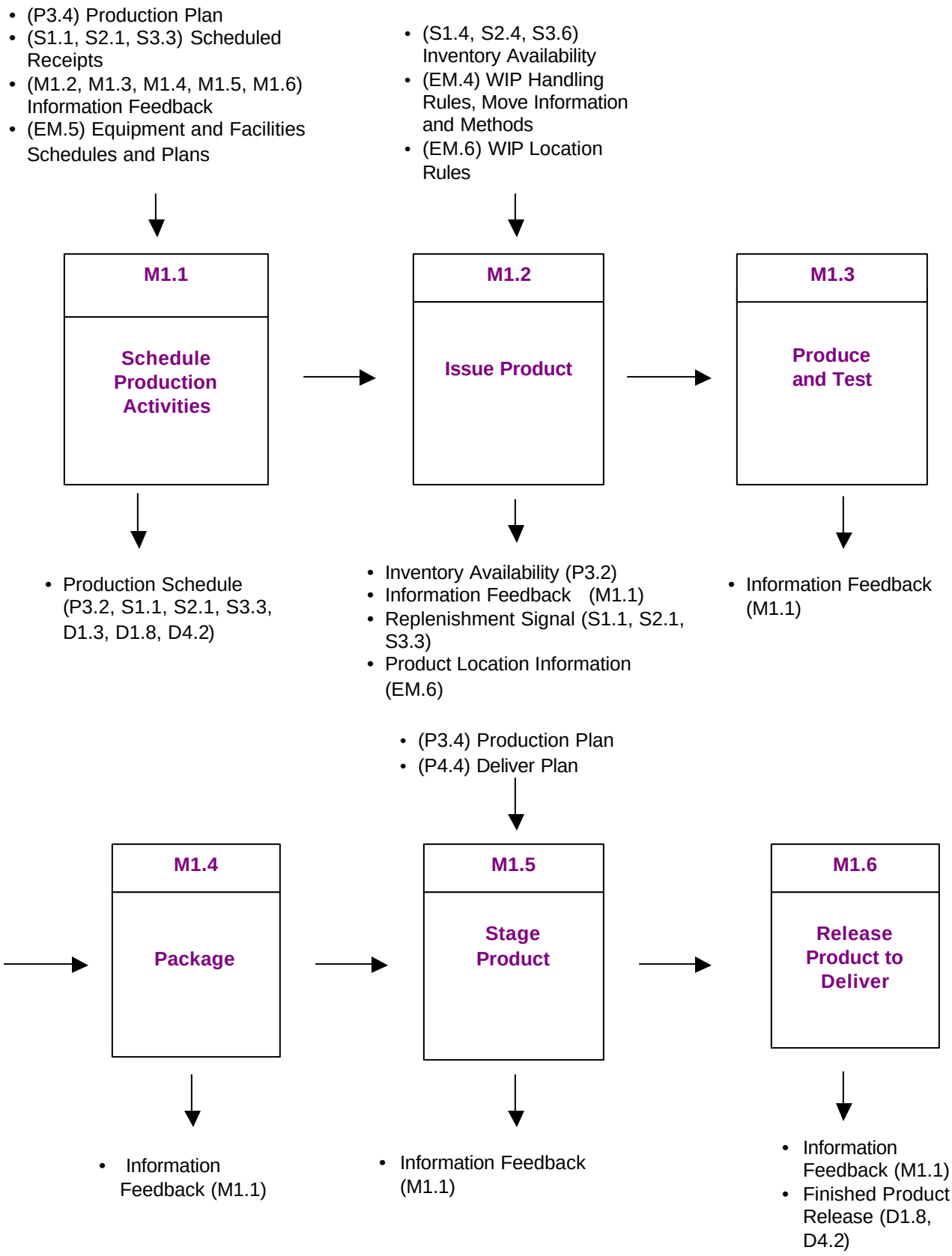
MAKE

M1: Make-to-Stock



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Process Category: Make-to-Stock	Process Number: M1
Process Category Definition	
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," are completed prior to receipt of a customer order, and are generally produced in accordance with a sales forecast.	
Performance Attributes	**Metric**
Reliability	Warranty costs Performance to customer request date Yield
Responsiveness	Item/Product/Grade changeover time Total Item/Product manufacture time
Flexibility	Re-plan Cycle Time Item/Product/Grade changeover time
Cost	Value-Added Productivity Plant Operating Cost per hour Indirect to direct headcount ratio Cost\unit Overhead cost Product Losses (Sourced/In-Process/Finished)
Assets	Asset Turns Capacity utilization Inventory Aging WIP days of supply
Best Practices	**Features**
Cellular manufacturing	Manufacturing is broken into work cells
Demand-pull manufacturing, including active reduction of manufacturing system time and WIP through the use of demand-pull mechanisms and visual controls	Support for demand-pull mechanisms (Kanban, replenishment signals, ETC.) based on rate schedules and user defined minimum and maximum trigger points.
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
Organization to enhance flexibility: Few job classifications, self-directed work force, flat management structure, and cross-functional work teams.	Support for modular skills inventory with links to training databases, compensation systems, and operator instructions.
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.
Link individual performance to organizational and divisional goals	None Identified
Provide continuous formal training to employees	Examples would be TQM, Six Sigma
Implement employee involvement programs	Postponement of final configuration to the nearest point to the customer. EG. Do configuration at warehouse.
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
Accurate and low cost batch/configuration records for warranty and regulatory tracking	Electronic batch/configuration records
Production level loading	Capacity planning
Lean Manufacturing	Use a team based systematic approach to identifying and eliminating wasteful, or non-value adding, activities within your manufacturing organization.

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Vendor Managed inventory	Allows optimum use of production capacity and reduces inventory. Use internet technologies to provide the required business-to-business interfaces.
Accurate and approved work instructions/ process plans	Electronic document management that maintains current Standard operation procedures (SOPs)

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Process Element: Schedule Production Activities	Process Element Number: M1.1
Process Element Definition	
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**
Reliability	Schedule achievement
Responsiveness	None Identified
Flexibility	Schedule Interval Upside Production Flexibility Downside Production Flexibility
Cost	WIP inventory days of supply Scheduled resource costs
Assets	Capacity utilization
Best Practices	**Features**
Cross training/Certification	HR/Certification support
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 optimizes use of shared resources, such as production equipment and tooling	Detailed production scheduling model and simulation capabilities
Schedule includes preventive maintenance program	Interface between maintenance management system and scheduling system
Schedule minimizes changeover costs	Detailed production scheduling model and simulation capabilities
Real-time feedback from Production, raw material and finished goods inventory and test activities.	Allow dynamic re-synchronization of MAKE activities by tying in real time status information to scheduler.
Provide scheduling output back to material and labor planning systems.	Accurate, real time information.

Inputs	Plan	Source	Make	Deliver
Production Plan	P3.4			
Scheduled Receipts – depends upon the type of sourced product required. The item sourced could be from a vendor's make-to-stock process, make-to-order, or engineer-to-order process.		S1.1, S2.1, S3.3		
Information Feedback			M1.2, M1.3, M1.4, M1.5, M1.6	
Equipment and Facilities Schedules and Plans			EM.5	

Outputs	Plan	Source	Make	Deliver
Production Schedule - information is used as feedback for Plan and Source support processes. Projection of inventory availability for Deliver planning also requires the production schedule as feedback information.	P3.2	S1.1, S2.1, S3.3		D1.3, D1.8, D4.2

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Process Element: Issue Material	Process Element Number: M1.2

Process Element Definition

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
Reliability	Inventory accuracy Out of stock occurrences
Responsiveness	Sourced/in-process product requisition cycle time
Flexibility	None Identified
Cost	Inventory obsolescence Inventory days supply - sourced product, in-process product
Assets	Cash-to-cash cycle time
Best Practices	**Features**
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.
Electronic material move transactions	Automated process control and/or barcode data collection
Back flush material at order completion	Flexible back flush logic
Complete lot history	Inventory by lot of sourced/in-process product 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

Inputs	Plan	Source	Make	Deliver
Inventory Availability		S1.4, S2.4, S3.6		
WIP Handling Rules, Move Information and Methods			EM.4	
WIP Location Rules			EM.6	

Outputs	Plan	Source	Make	Deliver
Inventory Availability	P3.2			
Information Feedback			M1.1	
Replenishment Signal		S1.1, S2.1, S3.3		
Sourced Product Location Information			EM.6	

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Process Element: Produce and Test	Process Element Number: M1.3
Process Element Definition	
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**
Reliability	Fill rates Ratio of actual to theoretical cycle time Warranty and returns Yields Scrap expense In-process failure rates
Responsiveness	Total build cycle time Product/Grade Changeover Time
Flexibility	Intra-Manufacturing Re-Plan Cycle
Cost	Total Production Employment Value Added Productivity Warranty Costs
Assets	Capacity utilization Asset Turns
Best Practices	**Features**
Authorize each operation to assess the quality of the previous operations	None Identified
Paperless production control	Electronic dispatch of operations
Accurate and approved process plans/specifications	Electronic document management
Reduce chances of operator error	Automatic download of production equipment with batch recipes/part programs
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
Reduce non-value added activities, including queue, move, and set-up times	Use principals of Lean Manufacturing
Accurate batch/configuration records for warranty and regulatory tracking	Electronic batch recording/configuration
Just-in-time demand flow techniques	Demand-pull mechanisms
Design/upgrade production equipment to maximize flexibility and avoid line stoppages	Machine productivity and downtime monitoring
Real time quality control techniques	Electronic collection of quality data and online SPC
Maintain accurate lot/batch history information	Electronic data collection of employee actions and sourced/in-process product lot used

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M1.1	

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Process Element: Package	Process Element Number: M1.4
Process Element Definition	
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**
Reliability	Warranty costs
Responsiveness	Package cycle time
Flexibility	None Identified
Cost	Packaging cost Scrap packaging expense
Assets	Asset turns Capacity utilization
Best Practices	**Features**
Design/upgrade production equipment to maximize flexibility and avoid line stoppages	Machine productivity and downtime monitoring
Accurate and approved process plans, routings, specifications and procedures	Electronic document management
Up-to-date shop packet/specification for each unique production event/demand	Electronic Work Instructions
Paperless production control	Electronic dispatch of operations
Minimize operator induced errors	Automatic download of production equipment with setup parameters Graphical display of setup/changeover/layout
Reduce non-value added paperwork while still maintaining process metrics	Electronic data collection of completion, quality, lot trace ability, scrap, and labor data
Packaging operation is an integral part of the overall production process	None Identified
Accurate and low cost batch/configuration records for warranty and regulatory tracking	Electronic batch/configuration records
Automatic label and seal verification	Automatic interface to inspection systems

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M1.1	

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Process Element: Stage Finished Product	Process Element Number: M1.5
Process Element Definition	
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**
Reliability	Staging time
Responsiveness	None Identified
Flexibility	None Identified
Cost	Inventory Carrying Cost
Assets	Inventory days supply—plant FG
Best Practices	**Features**
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	Bar code data collection

Inputs	Plan	Source	Make	Deliver
Production Plan, Deliver Plan as they influence where you stage product due to size of production runs or timing of expected release to Delivery	P3.4, P4.4			

Outputs	Plan	Source	Make	Deliver
Information Feedback			M1.1	

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Process Element: Release Finished Product to Deliver	Process Element Number: M1.6
Process Element Definition	
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**
Reliability	% Release errors
Responsiveness	Quarantine or Hold time Release process cycle time
Flexibility	None Identified
Cost	Release cost per unit
Assets	None Identified
Best Practices	**Features**
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
Automated notification of laboratory regarding sample availability	Interface between production system and LIMS

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M1.1	
Finished Product Release				D1.8, D4.2

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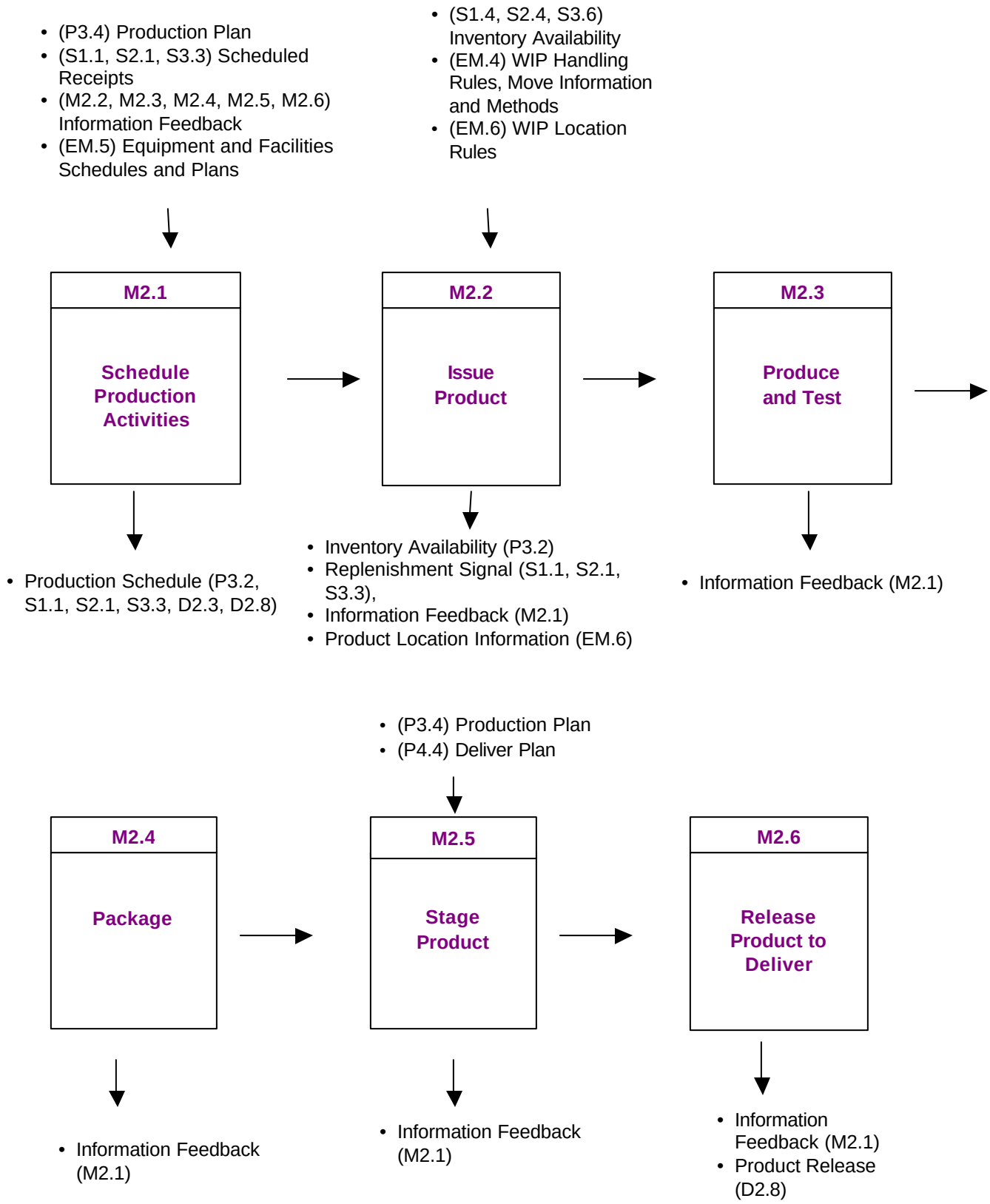
M2: Make-to-Order



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Process Category: Make-to-Order	Process Number: M2
Process Category Definition	
The process of manufacturing in a make to order environment adds value to products through mixing, separating, forming, machining, and chemical processes. A make to order environment is one in which products are completed after receipt of a customer order and are built or configured only in response to a customer order.	
Performance Attributes	**Metric**
Reliability	Warranty costs Performance to customer request date Performance to customer commit date Yield
Responsiveness	Item/Product/Grade changeover time Total Item/Product manufacture time
Flexibility	Re-plan Cycle Time Item/Product/Grade changeover time
Cost	Value-added productivity Average plant-wide salary Plant Operating Cost per hour Indirect to direct headcount ratio Unit cost Overhead cost Product Losses (Sourced/In-Process/Finished)
Assets	Asset Turns Capacity utilization Inventory Aging
Best Practices	**Features**
Organization to enhance flexibility: Few job classifications, self-directed work force, flat management structure, and cross-functional work teams.	Support for modular skills inventory with links to training databases, compensation systems, and operator instructions.
Delivery schedules are collaboratively developed with customers	Web-based access to plant scheduling status, collaborative data-sharing environment.
Posted performance results	Data warehouse, report writing, real time data base, and EIS systems
Accurate and approved work instructions/ process plans	Electronic document management
Accurate and low cost batch/configuration records for warranty and regulatory tracking	Electronic batch/configuration records
Paperless order tracking and customer visibility of orders.	Electronic dispatch and data collection with external interface to internet.
Produce products to unique customer requirements	Order entry specifications linked to manufacturing order
Cellular and demand pull manufacturing	Support for cellular and demand pull manufacturing execution
Production level loading	Capacity planning
Link individual performance to organizational and divisional goals	None Identified
Provide continuous formal training to employees	None Identified
Implement employee involvement programs	None Identified
Build subassemblies/products to forecast at highest generic level to minimize make cycle time	None Identified

Process Element: Schedule Production Activities	Process Element: M2.1
Process Element Definition	
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**
Reliability	Percent of orders scheduled to customer request date Schedule achievement
Responsiveness	None Identified
Flexibility	Schedule interval Upside Production Flexibility Downside Production Flexibility
Cost	WIP inventory days of supply Scheduled resource costs Plant level order management costs
Assets	Capacity utilization
Best Practices	**Features**
Produce products to unique customer specification	Order entry, engineering, and product specifications linked to production order
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
Schedule optimizes use of shared resources such as tooling and production equipment	Scheduling utilizing optimization techniques Required production resources included in routing/process instructions
Demand-pull manufacturing, including active reduction of manufacturing system time and WIP through the use of demand-pull mechanisms and visual controls	Support for demand-pull mechanisms (Kanban, replenishment signals, ETC.) based on rate schedules and user defined minimum and maximum trigger points.
Schedule minimizes product changeover costs	Advanced scheduling systems that optimize production schedules to minimize setup/cleaning and optimize job sequences
Schedule includes preventative maintenance program	Interface between maintenance system and scheduling system
Maintain data integrity and system accuracy by ensuring 99%+ production data, inventory levels, and schedule requirements	Detail production scheduling model that synchronizes Plan and Make activities
Cross Training/certification	HR/certification support
Demand pull mechanisms	Repetitive scheduling and sequencing
Additional capacity for overflow demand	Outsource manufacturing and work force augmentation providers connected to production schedules via the internet.

Inputs	Plan	Source	Make	Deliver
Production Plan	P3.4			
Scheduled Receipts – depend upon the type of sourced product required. The item sourced could be from a vendor's make-to-stock process, make-to-order, or engineer-to-order process.		S1.1, S2.1, S3.3		
Information Feedback			M2.2, M2.3, M2.4, M2.5, M2.6	
Equipment and Facilities Schedules and Plans			EM.5	

Outputs	Plan	Source	Make	Deliver
Production Schedule	P3.2	S1.1, S2.1, S3.3		D2.3, D2.8

Process Element: Issue Sourced/In-Process Product	Process Element Number: M2.2
Process Element Definition	
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**
Reliability	Inventory accuracy % Parts received at point of use
Responsiveness	Sourced/In-Process Product requisition cycle time
Flexibility	None Identified
Cost	Inventory obsolescence Inventory days of Supply
Assets	Cash-to-cash cycle time
Best Practices	**Features**
Demand-pull mechanisms; Kanban replenishment signals from stockroom, intermediate products, or subassembly area	None Identified
Strategic safety stock of selected materials, items, or subassemblies to decouple sourced product issuance cycle time from supplier lead time	None Identified
Electronic material move transactions	Automated process control and/or barcode data collection
Complete lot history	Inventory by lot of sourced/in-process or discrete order /usage reporting by lot or discrete order
Back flush material at order completion	Flexible back flush logic
Supplier delivery to production process at point of use	EDI link to supplier's sales order and inventory systems

Inputs	Plan	Source	Make	Deliver
Inventory Availability		S1.4, S2.4, S3.6		
WIP Handling Rules, Move Information and Methods			EM.4	
WIP Location Rules			EM.6	

Outputs	Plan	Source	Make	Deliver
Inventory Availability	P3.2			
Replenishment Signal		S1.1, S2.1, S3.3		
Information Feedback			M2.1	
Sourced Product Location Information			EM.6	

Process Element: Produce and Test	Process Element Number: M2.3
Process Element Definition	
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**
Reliability	Ratio Of Actual To Theoretical Cycle Time Scrap expense In-process failure rates Yields
Responsiveness	Total Build Cycle Time Intra-Production Re-Plan Cycle Product/Grade Changeover Time
Flexibility	None Identified
Cost	Warranty costs Value-Added Productivity Total Production Employment
Assets	Capacity utilization Asset Turns
Best Practices	**Features**
Just-in-Time/demand flow techniques	Real time data collection
Design/upgrade production equipment to maximize flexibility and avoid line stoppages	Machine productivity and downtime monitoring
Real time quality control techniques	Electronic collection of quality data and on-line SPC
Up-to-date shop packet/specifications	Electronic work instructions
Authorize each operation to assess the quality of the previous operations	None Identified
Paperless production control	Electronic dispatch of operations
Accurate and approved process plans/specifications	Electronic document management
Reduce chances of operator error	Automatic download of production equipment with batch recipes/part programs
Reduce non-value added paperwork while still measuring process metrics	Electronic data collection of completion, quality, scrap, labor and equipment data
Reduce non-value added activities, including queue, move, and set-up times	None Identified
Accurate and low cost batch/configuration records for warranty and regulatory tracking	Electronic batch recording/configuration
Maintain accurate lot/batch history information	Electronic data collection of employee actions and sourced/in-process product lot used

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M2.1	

Process Element: Package	Process Element Number: M2.4
Process Element Definition	
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**
Reliability	Warranty costs Yield
Responsiveness	Package cycle time
Flexibility	None Identified
Cost	Packaging cost Scrap Packaging expense
Assets	Asset turns Capacity Utilization
Best Practices	**Features**
Postponement and pre-kitting of accessories into modular packages that allow flexibility while maintaining control	None Identified
Design/upgrade production equipment to maximize flexibility and avoid line stoppages	Machine productivity and downtime monitoring
Accurate and approved process plans, routings, specifications and procedures	Electronic document management
Up-to-date shop packet/specification for each unique production event/demand	Electronic Work Instructions
Paperless production control	Electronic dispatch of operations
Minimize operator induced errors	Automatic download of production equipment with setup parameters Graphical display of setup, changeover, or layout
Reduce non-value added paperwork while still measuring process metrics	Electronic data collection of completion, quality, scrap, and labor data
Packaging operation is an integral part of the overall production process	None Identified
Accurate and low cost batch/configuration records for warranty and regulatory tracking	Electronic batch/configuration records
Automatic label and seal verification	Automatic interface to inspection systems

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M2.1	

Process Element: Stage Finished Product	Process Element Number: M2.5
Process Element Definition	
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**
Reliability	Staging time
Responsiveness	None Identified
Flexibility	None Identified
Cost	Inventory carrying cost
Assets	Inventory Days Supply—Plant FG
Best Practices	**Features**
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	Bar code data collection

Inputs	Plan	Source	Make	Deliver
Production Plan, Delivery Plan as they influence where you stage product due to size of production runs or timing of expected release to Delivery.	P3.4, P4.4			

Outputs	Plan	Source	Make	Deliver
Information Feedback			M2.1	

Process Element: Release Finished Product to Deliver	Process Element Number: M2.6

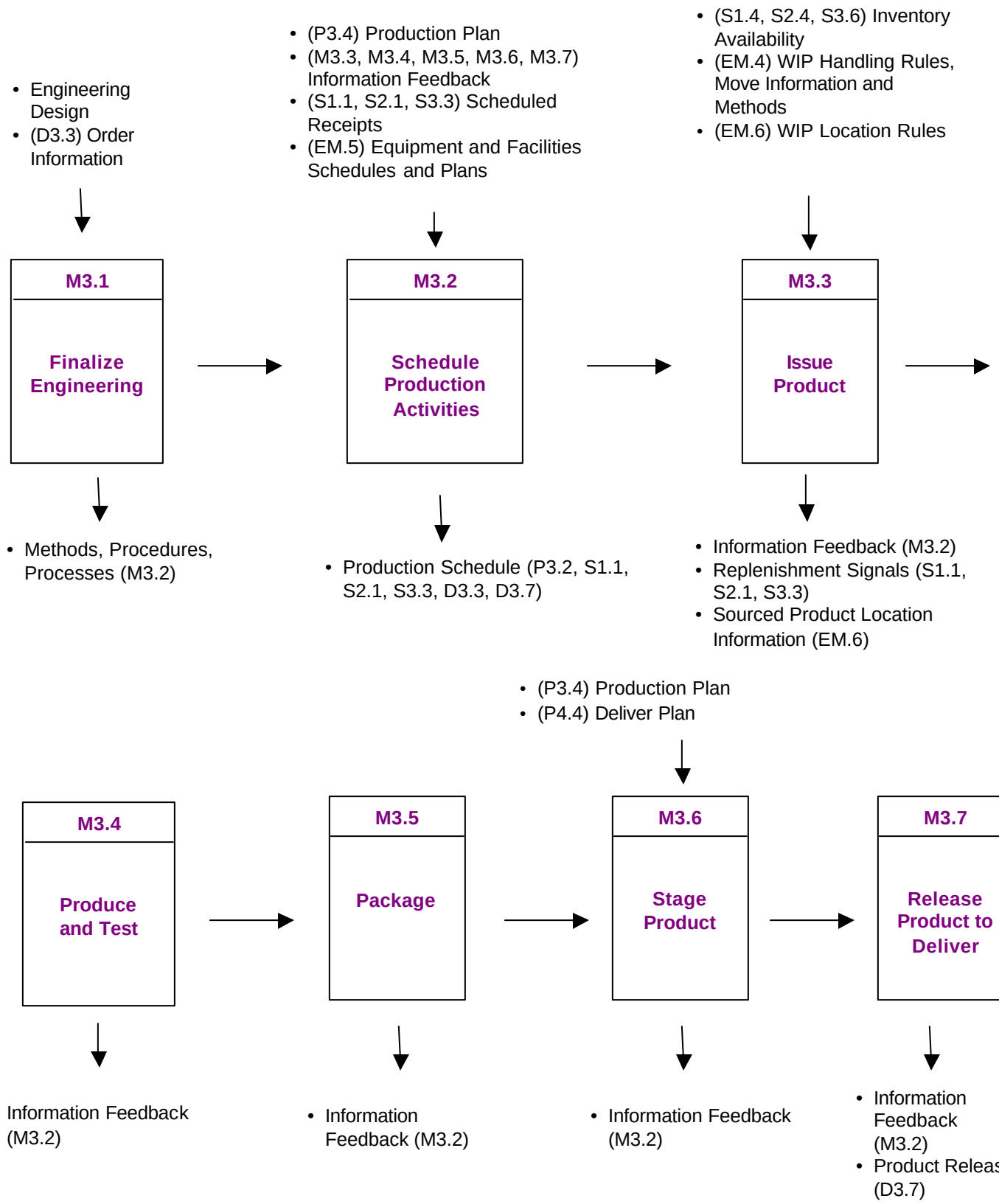
Process Element Definition
Activities associated with post-production documentation, testing, or certification required prior to delivery of finished product to customer. Examples include assembly of batch records for regulatory agencies, laboratory tests for potency or purity, creating certificate of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

Performance Attributes	Metric
Reliability	% Release errors
Responsiveness	Quarantine or Hold time Release process cycle time
Flexibility	None Identified
Cost	Release cost per unit
Assets	None Identified
Best Practices	**Features**
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
Automated notification of laboratory regarding sample availability	Interface between production system and LIMS

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M2.1	
Finished Product Release				D2.8

M3: Engineer-to-Order



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Process Category: Engineer-to-Order	Process Number: M3
Process Category Definition	
The process of manufacturing 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. While Make to Order includes standard products built only in response to a customer order or products configured in response to a customer order, Engineer to Order includes custom products that are designed, developed, and manufactured in response to a specific customer request.	
Performance Attributes	**Metric**
Reliability	Warranty costs Performance to customer-request date Performance to commit date
Responsiveness	Total Item/Product manufacture time
Flexibility	ECO cycle time
Cost	Value-added productivity Average plant-wide salary ECO cost Unit cost Overhead cost Product Losses (Sourced/In-Process/Finished)
Assets	Asset turns Capacity utilization Inventory aging
Best Practices	**Features**
Cellular manufacturing	None Identified
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
Delivery schedules are collaboratively developed with customers.	Web-based access to plant scheduling status, collaborative data-sharing environment.
Posted performance results	None Identified
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
Product design collaboration with customers	On-line design tools facilitated by internet connections.

Process Element: Finalize Production Engineering	Process Element Number: M3.1

Process Element Definition
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
Reliability	Deliver to commit date variance Number of ECOs
Responsiveness	Production Engineering Cycle time
Flexibility	None Identified
Cost	ECO cost
Assets	Capacity Utilization
Best Practices	**Features**
Automated Configuration Management	Configuration
Automated conversion of engineering drawings into product specifications	None Identified

Inputs	Plan	Source	Make	Deliver
Engineering Design				
Order Information				D3.3

Outputs	Plan	Source	Make	Deliver
Methods, Procedures, Processes			M3.2	

Process Element: Schedule Production Activities	Process Element Number: M3.2
Process Element Definition	
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**
Reliability	% Orders scheduled to customer request date Schedule achievement
Responsiveness	None Identified
Flexibility	Schedule interval Upside Production Flexibility Downside Production Flexibility
Cost	Inventory days of supply Plant-level order management costs
Assets	Capacity utilization
Best Practices	**Features**
Build subassemblies to forecast at highest generic level in Bill of Material; maintain flexibility while minimizing cycle time and inventory position	None Identified
Demand-pull mechanisms	Repetitive scheduling or sequencing of unique orders
Schedule reflects current plant status (equipment, jobs, and other resources on-line)	On-line reporting from operations
Schedule optimizes use of shared resources, such as tooling	Resource needs included in routing or Bill of Material
Cellular manufacturing	None Identified
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 preventive maintenance program	Interface to maintenance management system
Maximize data integrity and system accuracy by ensuring 99%+ accuracy of BOM configuration, inventory levels, and schedule requirements	None Identified
Design/upgrade production equipment to maximize flexibility and avoid line stoppages	None Identified
Cross-training	None Identified
Additional capacity for overflow demand	Outsource manufacturing and work force augmentation providers connected to production schedules via the internet.

Inputs	Plan	Source	Make	Deliver
Production Plan	P3.4			
Information Feedback			M3.3, M3.4, M3.5, M3.6, M3.7	
Scheduled Receipts – depend upon the type of sourced product required. The item sourced could be from a vendor's make-to-stock process, make-to-order, or engineer-to-order process.		S1.1, S2.1, S3.3		
Equipment and Facilities Schedules and Plans			EM.5	

Outputs	Plan	Source	Make	Deliver
Production Schedule	P3.2	S1.1, S2.1, S3.3		D3.3, D3.7

Process Element: Issue Sourced/In-Process Product	Process Element Number: M3.3
Process Element Definition	
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**
Reliability	Inventory accuracy
Responsiveness	Sourced/In-Process Product requisition cycle time
Flexibility	None Identified
Cost	Inventory obsolescence
Assets	Cash-to-cash cycle time
Best Practices	**Features**
Demand-pull mechanisms; Kanban replenishment signals from stockroom or subassembly area	None Identified
Supplier delivery to production line at point-of-use	EDI link to supplier's sales order and inventory systems
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
Strategic safety stock of selected materials, items or subassemblies to decouple sourced product issuance cycle time from supplier lead time'	None Identified
Electronic material move transactions	Bar code data collection
Back flush material at order completion	Flexible back flush logic

Inputs	Plan	Source	Make	Deliver
Inventory Availability		S1.4, S2.4, S3.6		
WIP Handling Rules, Move Information and Methods			EM.4	
WIP Location Rules			EM.6	

Outputs	Plan	Source	Make	Deliver
Information Feedback			M3.2	
Replenishment Signal		S1.1, S2.1, S3.3		
Sourced Product Location Information			EM.6	

Process Element: Produce and Test	Process Element Number: M3.4
Process Element Definition	
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**
Reliability	Scrap expense In-process failure rates Yields Yield variability
Responsiveness	Total Build Cycle Time Intra-Production Re-Plan Cycle Ratio Of Actual To Theoretical Cycle Time
Flexibility	None Identified
Cost	Warranty costs Total Production Employment Value Added Productivity
Assets	Asset turns
Best Practices	**Features**
Just-in-time demand flow techniques	Streamlined data collection
Design/upgrade production equipment to maximize flexibility and avoid line stoppages	Machine productivity and downtime monitoring
Authorize each operation to assess the quality of the previous operations and prevent operator-introduced errors	Automatic download of production equipment with part programs
Paperless production control	Electronic dispatch of operations
Real time statistical control techniques	Electronic collection of defect data and on-line SPC
Up-to-date shop packet/specifications	Electronic work instructions
Reduce non-value added paperwork while still measuring process metrics	Electronic data collection of completion, quality, scrap, and labor data
Reduce non-value added activities, including queue, move, and set-up times	None Identified
Link individual performance to organizational and divisional goals	None Identified
Provide continuous formal training to employees	None Identified
Implement employee involvement program	None Identified
Maintain accurate lot/batch history information	Electronic data collection of employee actions and sourced/in-process lot or subassemblies used

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M3.2	

Process Element: Package	Process Element Number: M3.5
Process Element Definition	
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**
Reliability	Warranty costs
Responsiveness	Package cycle time
Flexibility	None Identified
Cost	Warranty costs Packaging Costs Scrap Packaging Expense
Assets	Asset turns Capacity utilization
Best Practices	**Features**
Postponement and pre-kitting of accessories into modular packages that allow flexibility while maintaining control	None Identified
Design/upgrade production equipment to maximize flexibility and avoid line stoppages	Machine productivity and downtime monitoring
Up to date shop packet/specifications	Electronic work instructions
Paperless production control	Electronic dispatch of operations
Minimize operator-induced errors	Automatic download of production equipment with setup parameters
Reduce non-value added paperwork while still measuring process metrics	Electronic data collection of completion, quality, lot tractability, scrap, and labor data
Packaging operation is an integral part of the overall production process	None Identified
Automatic label and seal verification	Automatic interface to inspection systems

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M3.2	

Process Element: Stage Finished Product	Process Element Number: M3.6
Process Element Definition	
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**
Reliability	Staging Time
Responsiveness	None Identified
Flexibility	None Identified
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
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 product move transactions	Bar code data collection

Inputs	Plan	Source	Make	Deliver
Production Plan, Deliver Plan as they influence where you stage product due to size of production runs or timing of expected release to Delivery.	P3.4, P4.4			

Outputs	Plan	Source	Make	Deliver
Information Feedback			M3.2	

Process Element: Release Product to Deliver	Process Element Number: M3.7
Process Element Definition	
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**
Reliability	% Release errors
Responsiveness	Quarantine or Hold time Release process cycle time
Flexibility	None Identified
Cost	Release cost per unit
Assets	None Identified
Best Practices	**Features**
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
Automated notification of laboratory regarding sample availability	Interface between production system and LIMS

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Information Feedback			M3.2	
Finished Product Release				D3.7

EM: Enable Make

- Business Plans
- Corporate Objectives and Strategies
- Product Design
- (P) Functional Strategies, Production Plans, Production Capability

EM.1

Manage Production Rules

- Production Rules (P, S, M, D)

- Business Plans
- Corporate Objectives and Strategies
- Product Design/Quality
- (P) Functional Strategies, Production Plans, Production Capability

EM.2

Manage Production Performance

- Production Rules (P, S, M, D)
- Production Quality and Policies (EM.5)

- Information Needed to Create and Maintain IT
- (P, S, M, D) Information Needs Analysis
- (S, M) Systems Capability
- (P, S, M, D) Information from Business Processes

EM.3

Manage MAKE Information

- Information Infrastructure Plan (P, S)
- Reports, Information, and Documents (P, S, M, D)

- (P) Capacity Requirements, Production Orders Planned
- (S) Incoming Product Information
- (D) Returned Product Information

EM.4

Manage In-Process Products (WIP)

- WIP Handling Rules, Move Information and Methods (P, S, M1.2, M2.2, M3.3, EM.6, D)

- (P) Production Plans and Budgets
- (S) MRO Parts Availability
- (EM.2) Production Quality and Policies
- Equipment and Facilities Monitoring Information
- Manufacturer's Recommended Maintenance Schedules & Specifications

EM.5

Manage Equipment and Facilities

- Preventative Maintenance and Calibration Schedule (P, S, M1.1, M2.1, M3.2)
- Equipment and Facilities Schedules and Plans (M1.1, M2.1, M3.2)
- Equipment and Facilities Replacement and Disposition Plans (P, EM.6)
- Parts and Services Consumed (S)
- Equipment and Facilities Maintenance History (S, M)
- Production Status (EM.7)

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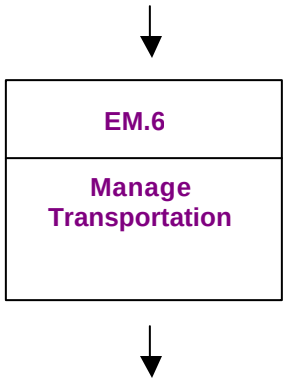
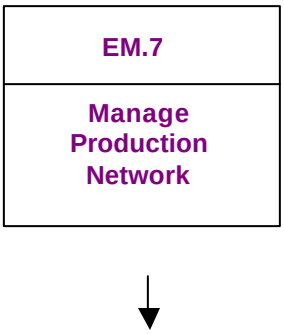
EM: Enable Make

- Production Orders Planned and Actual Reports
- (P) Capacity Requirements
- (S) Supplier Agreement
- (M1.2, M2.2, M3.3, D) Product Location Information
- (P, S, M, EM.4, D) WIP Handling Rules
- (EM.5) Equipment and Facilities Replacement and Disposition Plans
- (EM.7) Projected Delivery Requirements



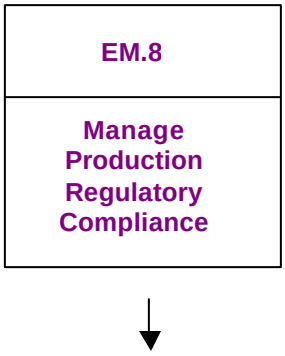
- WIP Location Rules (M1.2, M2.2, M3.3, D2.8)
- WIP Move Information and Methods (P, S, M, D)

- (P) Supply Chain Plans, Planning Data
- (EM.5) Production Status



- Internal Capacity (P, S)
- Cost to Produce (P)
- Projected Delivery Requirements (P, EM.6, D)

- (P, S, M) External Regulatory Information
- Corporate Objectives and Strategies
- Product Design/Claims
- Equipment and Facility Characteristics



- Conformance Rules (M)
- Conformance Plan (S, M)

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Enable Process: Manage Production Rules	Process Number: EM.1
Enable Process Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	Production Rules Preparation Cycle Time (PRPCT)
Cost	Plant Level Order Management Costs Total Internal and/or External Costs That Are The Result of Inaccurate Production Rule Details
Assets	% Utilization of Production Rules Preparation
Best Practices	**Features**
Attribute-Based Process Planning	Computer aided process planning / recipe management
On Line Access And Notification Of Tooling And Equipment Information	Delivery of tooling and equipment details drawings
Automated Engineering Specifications	Automated Intelligence (Heuristic) - based engineering specifications system
Automated Links To Existing CAD & CAM Information	Electronic hypertext or links to existing database of detail/parts/setup sketches/drawings
Automatic Generation / Configuration Of Tooling / Set-Up Instructions	Parametric driven (Group Technology - based) manufacturing design system
Pre-Defined Manufacturing Design Rules	Libraries of manufacturing capabilities or design envelopes
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
Automatic Notification When To Begin And When To Complete	Workflow/Groupware
Storage And Configuration Management For Release And Revision Control Of Final Documents	Product data management (PDM) or Electronic Data Management (EDM) feature set
Electronic Documentation And Imaging	Graphical display of drawings, diagrams, recipes/formulas, specifications, instructions, etc., to all users
Document Control	Control who can create, revise and access information
Genealogy Tracking	Where-used listing of as-planned vs. as-built documentation
Design For Production	Table of manufacturing capacities or design envelops (capacities; envelop sizes; tank, vessel or batch sizes)

Inputs	Plan	Source	Make	Deliver
Corporate Objectives and Strategies				
Functional strategies	EP.4, .5, .6.			
Business Plans				
Production Plans	P3.4, P			
Product Design				
Production Capability	EP, PM			

Outputs	Plan	Source	Make	Deliver
Production Rules	P	S	M	D

Enable Process: Manage Production Performance	Process Number: EM.2
Enable Process Definition	
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**
Reliability	Percent standards completed on time Percentage of "right first-time" corrective actions
Responsiveness	None Identified
Flexibility	Time interval between a Performance Standard request and availability.
Cost	Costs Associated with Managing Production Performance as a % Manufacturing Controllable Cost.
Assets	None Identified
Best Practices	**Features**
Standards and measurements aligned to maximize supply chain performance	Internal/external benchmarking, industry standards, customer/supplier alignment agreements, visibility of key performance indicators
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.
Periodic Review of Standards	Process for establishing and maintaining review schedules

Inputs	Plan	Source	Make	Deliver
Business Plans				
Corporate Objectives and Strategies				
Product Design/Quality				
Functional Strategies, Production Plans, Production Capability	P			

Outputs	Plan	Source	Make	Deliver
Production Rules	P	S	M	D
Production Quality and Policies			EM.5	

Enable Process: Manage MAKE Information	Process Number: EM.3
Enable Process Definition	
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**
Reliability	% Of time data is available when needed % Of data accuracy Production Process Validation Frequency Decision Timeframe Ratio
Responsiveness	None Identified
Flexibility	Time from occurrence of an event to dissemination of the information
Cost	Ratio of the Cost of Managing MAKE Information/Manufacturing Controllable Costs
Assets	% Of information management assets used / production assets
Best Practices	**Features**
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
Continuous Improvement	Historical trending, cause and effect analysis, and Key Performance Indicators Scheduling reviews of processes for possible improvements
On-demand access to available to promise (ATP), production schedules and inventory status by internal operations and customers.	Electronic management of products and orders with access to data via Web-based tools.

Inputs	Plan	Source	Make	Deliver
Information Needed to Create and Maintain IT				
Information Needs Analysis	P	S	M	D
Systems Capability		S	M	
Information from Business Processes	P	S	M	D

Outputs	Plan	Source	Make	Deliver
Information Infrastructure Plan	P	S		
Reports, Information, and Documents	P	S	M	D

Enable Process: Manage In-Process Products (WIP)	Process Number: EM.4
Process Element Definition	
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**
Reliability	WIP Inventory cycle-counting accuracy % Downtime due to non-availability of WIP
Responsiveness	None Identified
Flexibility	None Identified
Cost	Cost Of In-Process Product (WIP) Damaged from Handling/Storage as a Percentage of Total Material Cost Cost of handling of WIP Cost of storage space Administrative costs associated with handling/storage of WIP
Assets	% Equipment utilization for handling/storage of WIP % Space utilization for WIP storage
Best Practices	**Features**
First In – First Out	Part / WIP location by date received for those parts that must be stocked or staged in a holding area
Minimizing In-Process Product (WIP)	WIP Storage Management System Efficient Space Utilization Implementing Pull Systems
Supplier Managed Inventory	The supplier is responsible for maintaining inventory levels at the point of use. The software system verifies usage, receiving, and payment functions.
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.
In-Process Product (WIP) Handling Rules	Tracking, genealogy
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.
Optimize Packing	No packing and unpacking time required. Recyclable or no containers where appropriate. No discarded material.

Inputs	Plan	Source	Make	Deliver
Capacity Requirements, Production Orders Planned	P			
Incoming Sourced Product Information		S		
Returned Product Information				D

Outputs	Plan	Source	Make	Deliver
WIP Handling Rules, Move Information and Methods	P	S	M1.2, M2.2, M3.3, EM.6	D

Enable Process: Manage MAKE Equipment and Facilities	Process Number: EM.5
Process Element Definition	
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**
Reliability	Unplanned Maintenance Downtime % of total Production Time Percentage Completed PM Work Orders Mean Time Between Failure
Responsiveness	None identified
Flexibility	Mean Time to Repair Asset % Of New or Modified Equipment & Facilities Available when and where needed.
Cost	Equipment/Facility Maintenance Cost as % of Manufacturing Controllable Cost
Assets	Actual Asset Life Maintenance Cost as % of Replacement Value
Best Practices	**Features**
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.
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.
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.
Facility & Equipment Environmental / Safety Audit System	System software to list checklist items, report results of audit & forward actions to be taken
Supplier Managed Inventory Of Parts	E.D.I. linkage of Inventory Information
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
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.

Inputs	Plan	Source	Make	Deliver
Production Plans and Budgets	P		M	
MRO Parts Availability		S		
Production Quality and Policies			EM.2	
Equipment and Facilities Monitoring Information				
Manufacturer's Recommended Maintenance Schedules & Specifications				

Outputs	Plan	Source	Make	Deliver
Preventative Maintenance and Calibration Schedule	P	S	M1.1, M2.1, M3.2	
Equipment and Facilities Schedules and Plans			M1.1, M2.1, M3.2	
Equipment and Facilities Replacement and Disposition Plans	P			
Parts and Services Consumed		S		
Equipment and Facilities Maintenance History		S	M	
Production Status			EM.7	

Enable Process: Manage Transportation (WIP)	Process Number: EM.6
Enable Process Definition	
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**
Reliability	% Downtime due to non-delivery of WIP
Responsiveness	Time required to move In-Process Product (WIP) material
Flexibility	None Identified
Cost	Cost Of In-Process Product (WIP) Damaged from Handling/Storage as a Percentage of Total Material Cost Cost of handling and movement of in transit WIP materials Cost of in transit storage space Administrative Costs Associated with In-Transit Handling/Movement of In-Process Product
Assets	% Equipment utilization for in transit handling and movement of WIP
Best Practices	**Features**
Short Move Paths	Software that allows for input of the distance that particular parts / WIP need to be moved. This software then needs to provide a report based on the cubic feet of material times distance moved by part number
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)

Inputs	Plan	Source	Make	Deliver
Production Orders Planned and Actual Reports				
Capacity Requirements	P			
Supplier Agreement		S		
Sourced Product Location Information			M1.2, M2.2, M3.3	D
WIP Handling Rules	P	S	EM.4	D
Equipment and Facilities Replacement and Disposition Plans			EM.5	
Projected Delivery Requirements			EM.7	

Outputs	Plan	Source	Make	Deliver
WIP Location Rules			M1.2, M2.2, M3.3	D2.8
WIP Move Information and Methods	P	S	M	D

Enable Process: Manage Production Network	Process Number: EM.7
Process Definition	
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**
Reliability	% on time, % rejects
Responsiveness	Total manufacture time
Flexibility	Time for network re-design
Cost	None identified
Assets	ROTA (return on total assets)
Best Practices	**Features**
JIT environment	Schedule visibility, on-line communications between source and demand
Collaborative planning/scheduling	Interactive, on-line planning/scheduling systems. Capacity planning systems with accurate production capability data.
Production reporting/status	Real time monitoring of production status and In-Process Product (WIP)

Inputs	Plan	Source	Make	Deliver
Supply Chain Plans, Planning Data	P			
Production Status			EM.5	

Outputs	Plan	Source	Make	Deliver
Internal Capacity	P	S		
Cost to Produce	P			
Projected Delivery Requirements	P		EM.6	D

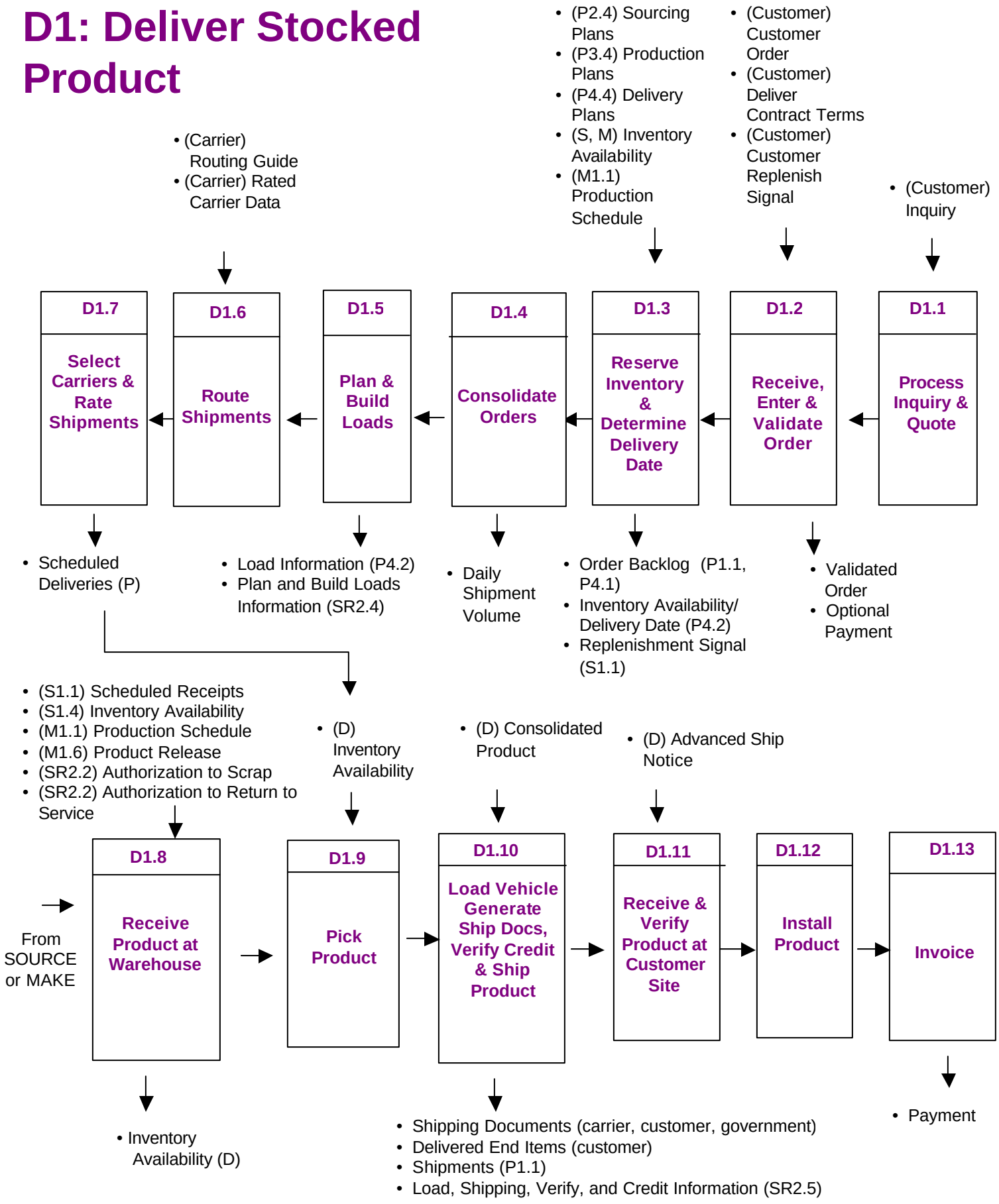
Enable Process: Manage MAKE Regulatory Compliance	Process Number: EM.8
Enable Process Definition	
The process of identifying and complying with regulatory documentation and process standards set by external entities (eg government)	
Performance Attributes	**Metric**
Reliability	% Regulations met by required date Severity of instances of non-conformance per unit time Downtime in MAKE due to compliance issues
Responsiveness	Regulatory documentation cycle time
Flexibility	Time to Comply with regulatory changes
Cost	Cost of compliance including administrative costs Cost of noncompliance
Assets	% Cost of assets used for compliance/total MAKE asset cost
Best Practices	**Features**
Automatic Generation And Submission Of Conformance Documents	Software specific to industry regulations and standards (eg may be software to produce MSDS documents, or FDA requirements, etc.)
Maintaining Repository Of Current Regulatory Requirements	Electronic subscription and publication of conformance documentation. Electronic Document Management System features.
Automated Conformance Monitoring And Control	Internal automatic notification of conformance, including holding of product until requirements are met

Inputs	Plan	Source	Make	Deliver
External Regulatory Information	P	S	M	
Corporate Objectives and Strategies				
Product Design/Claims				
Equipment and Facility Characteristics				

Outputs	Plan	Source	Make	Deliver
Conformance Rules			M	
Conformance Plan		S	M	

DELIVER

D1: Deliver Stocked Product



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Process Category: Deliver Stocked Product	Process Number: D1
Process Category Definition	
The process of delivering product that is maintained in a finished goods state prior to the receipt of a firm customer order.	
Performance Attributes	**Metric**
Reliability	Fill Rate
Responsiveness	**Published Delivery Cycle Time** **Deliver Cycle Time**
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	Order Management Costs
Assets	Finished Goods Inventory Days of Supply
Best Practices	**Features**
Rapid replenishment, VMI, EDI	None Identified
Electronic Catalogues/Malls	None Identified
Internet Ordering	None Identified
Efficient Consumer Response (ECR); Quick Response	Demand Planning, Deployment, Scheduling

Process Element: Process Inquiry & Quote	Process Element Number: D1.1
Process Element Definition	
Receive and respond to general customer inquiries and requests for quotes	
Performance Attributes	**Metric**
Reliability	# Of Call backs as % of total inquiries
Responsiveness	None Identified
Flexibility	None Identified
Cost	Order Management Costs-Not company specific
Assets	None Identified
Best Practices	**Features**
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 inquires (including order entry)	None Identified

Inputs	Plan	Source	Make	Deliver
(Customer) Inquiry				

Outputs	Plan	Source	Make	Deliver

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

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

Outputs	Plan	Source	Make	Deliver
Validated Order				
Optional Payment				

Process Element: Reserve Inventory & Determine Delivery Date	Process Element Number: D1.3
Process Element Definition	
Inventory (both on hand and scheduled) is identified and reserved for specific orders and a delivery date is committed and scheduled.	
Performance Attributes	**Metric**
Reliability	Delivery Performance To Customer Commit Date
Responsiveness	Order Receipt to Order Entry Complete Time
Flexibility	None Identified
Cost	Finished Goods Inventory Days of Supply Order Fulfillment Costs
Assets	Finished Goods Inventory Carry Cost
Best Practices	**Features**
EDI links between manufacturing and distributor to achieve visibility of complete finished goods inventory and expected shipments	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
ATP and Product Reservation	Integration with scheduling and inventory management
Priority-based inventory reservations, for key customers, with FIFO allocation for all others	None Identified
Inventory allocation exception process is clearly defined and jointly owned by manufacturing and sales	None Identified

Inputs	Plan	Source	Make	Deliver
Sourcing Plans	P2.4			
Production Plans	P3.4			
Deliver Plans	P4.4			
Inventory Availability		S	M	
Production Schedule			M1.1	

Outputs	Plan	Source	Make	Deliver
Order Backlog	P1.1, P4.1			
Inventory Availability/Delivery Date	P4.2			
Replenishment Signal		S1.1		

Process Element: Consolidate Orders	Process Element Number: D1.4
Process Element Definition	
The process of analyzing orders to determine the groupings that result in least cost/best service fulfillment and transportation.	
Performance Attributes	**Metric**
Reliability	Order Consolidation Profile
Responsiveness	Order Entry Complete to Order Ready for Shipment Time
Flexibility	None Identified
Cost	Transportation Costs
Assets	None Identified
Best Practices	**Features**
Consolidate orders by customer, source, traffic lane, carrier, etc.	Integrated load planning and building with warehouse management
Combine consolidation needs with other products/divisions/companies	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Daily Shipment Volume				

Process Element: Plan & Build Loads	Process Element Number: D1.5
Process Element Definition	
Transportation modes are selected and efficient loads are built.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	Transportation Costs
Assets	None Identified
Best Practices	**Features**
Consolidation of inbound and outbound requirements	Integrated inbound/outbound transportation planning
Build load in stop sequence (i.e. 1st truck destination loaded last, etc.)	Same as above
CRP & VMI loads optimized for utilization	Integration with CRP/VMI vendor systems

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Load Information	P4.2				

Process Element: Route Shipments	Process Element Number: D1.6
Process Element Definition	
Loads are consolidated and routed by mode, lane and location.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete to Order Ready for Shipment Time
Flexibility	None Identified
Cost	Transportation Costs
Assets	None Identified
Best Practices	**Features**
CRP/VMI	Integrated Load Building; Routing & Scheduling with Advanced Ship Notice (ASN)
Consolidation of Carriers	Transportation Modeling and Rate Analysis
Carrier/Route Optimization based on continuous movement and consolidation/pooling	Route scheduling, carrier selection, and rating
Shipment tracking and tracing	Satellite communications & GPS

Inputs	Plan	Source	Make	Deliver
(Carrier) Routing Guide				
(Carrier) Rated Carrier Data				

Outputs	Plan	Source	Make	Deliver

Process Element: Select Carriers & Rate Shipments	Process Element Number: D1.7
Process Element Definition	
Specific carriers are selected by lowest cost per route and shipments are rated and tendered.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Carrier Quote Response Time
Flexibility	None Identified
Cost	Transportation Costs
Assets	None Identified
Best Practices	**Features**
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

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Scheduled Deliveries	P			

Process Element: Receive Product at Warehouse	Process Element Number: D1.8
Process Element Definition	
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**
Reliability	Incoming Material Quality
Responsiveness	Dock To Stock Cycle Time
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	Distribution Costs Incoming Material Costs Product Acquisition Costs
Assets	Finished Goods Inventory Days of Supply Inventory Obsolescence as a % of Total Inventory End-of-Life Inventory
Best Practices	**Features**
Automatic Identification	Bar Coding & Radio Frequency Communications
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 put away, quality assurance, ABC frequency of access	Real time inventory control, stock locator, and rules based put away logic

Inputs	Plan	Source	Make	Deliver	Return
Scheduled Receipts		S1.1			
Inventory Availability		S1.4			
Production Schedule			M1.1		
Finished Product Release			M1.6		

Outputs	Plan	Source	Make	Deliver	Return
Inventory Availability				D	

Process Element: Pick Product	Process Element Number: D1.9
Process Element Definition	
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**
Reliability	Fill Rates
Responsiveness	Order Entry Complete to Order Ready for Shipment Time
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	Distribution Costs
Assets	None Identified
Best Practices	**Features**
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
Use of speed racks for automated material handling	None Identified

Inputs	Plan	Source	Make	Deliver
Inventory Availability				D

Outputs	Plan	Source	Make	Deliver

Process Element: Load Vehicle, Generate Shipping Documentation, Verify Credit & Ship Product	Process Element Number: D1.10
Process Element Definition	
The series of task including placing product onto vehicles, generating the documentation necessary to meet internal, customer, carrier and government needs, and sending the product to the customer.	
Performance Attributes	**Metric**
Reliability	Delivery Performance to Customer Commit Date Delivery Performance to Customer Request Date Perfect Order Fulfillment
Responsiveness	Order Entry Complete to Order Ready for Shipment Time
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
Advanced Shipping Notices & UCC128 container labeling	Bar coding; EDI; integrated transportation/warehouse management
Integrated Credit Checking	Interface to supplier's shipping system to financials
Shipment Tracking	None Identified
Electronic generation and download of shipping documents	None Identified
Full visibility of credit history by shipping personnel	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Consolidated Finished Product				D	

Outputs	Plan	Source	Make	Deliver	Return
Shipping Documents (carrier, customer, government)					
Delivered End Items (customer)					
Shipments	P1.1				

Process Element: Receive & Verify Product at Customer Site	Process Element Number: D1.11
Process Element Definition	
The process of receiving the shipment at the customer site and verifying that the order was shipped complete and that the product is of sufficient quality.	
Performance Attributes	**Metric**
Reliability	Perfect Order Fulfillment
Responsiveness	Order Ready for Shipment to Customer Receipt of Order Time
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
Advanced Shipping Notices & UCC128 container labeling	Bar coding; EDI; integrated transportation/warehouse management
Shipment Tracking	None Identified

Inputs	Plan	Source	Make	Deliver
Advanced Ship Notice				D

Outputs	Plan	Source	Make	Deliver

Process Element: Install Product	Process Element Number: D1.12
Process Element Definition	
When necessary, the process of preparing and installing the product at the customer site. The product is fully functional upon completion.	
Performance Attributes	**Metric**
Reliability	% Faultless Installations
Responsiveness	Installation Cycle Time (Measured in Days)
Flexibility	Upside Installation Flexibility Downside Installation Flexibility
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver

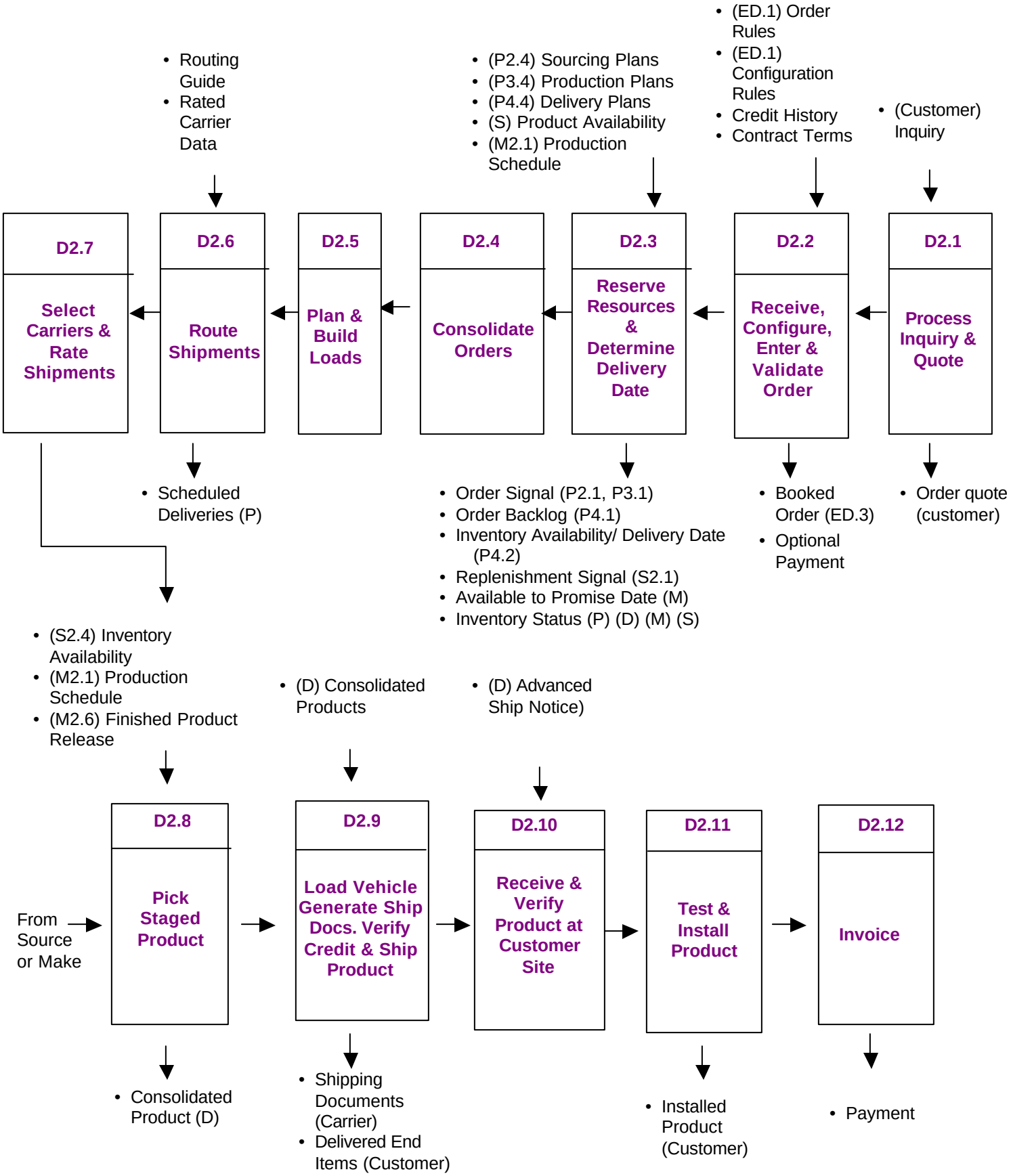
Outputs	Plan	Source	Make	Deliver

Process Element: Invoice & Receive Payment	Process Element Number: D1.13
Process Element Definition	
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**
Reliability	% Of Faultless Invoices
Responsiveness	Days Sales Outstanding
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	Customer Invoicing/Accounting Costs
Assets	Days Sales Outstanding
Best Practices	**Features**
Utilize EDI and EFT for payment to speed closing of receivables and to reduce processing costs	EDI transaction and network services
Provide visibility to and quickly escalate delinquent accounts for resolution	Integrated accounts receivables
Electronic transfer of shipment information to finance	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Payment				

D2: Deliver Make-to-Order Product



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Process Category: Deliver Make-to-Order Product	Process Number: D2
Process Category Definition	
The process of delivering product that is manufactured, assembled or configured from standard parts or subassemblies. Manufacture, assembly or configuration will begins only after the receipt and validation of a firm customer order.	
Performance Attributes	**Metric**
Reliability	Fill Rates Delivery Performance to Customer Commit Date Delivery Performance to Customer Request Date Perfect Order Fulfillment
Responsiveness	Published Delivery Cycle Time Deliver Cycle Time
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	Order Management Costs
Assets	Finished Goods Inventory Days of Supply Inventory Obsolescence as a % of Total Inventory-not company specific
Best Practices	**Features**
None Identified	None Identified

Process Element: Process Inquiry & Quote	Process Element Number: D2.1
Process Element Definition	
Receive and respond to general customer inquiries and requests for quotes.	
Performance Attributes	**Metric**
Reliability	# Call Backs As % Of Total Inquiries
Responsiveness	None Identified
Flexibility	None Identified
Cost	Order Management Costs
Assets	None Identified
Best Practices	**Features**
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

Inputs	Plan	Source	Make	Deliver
(Customer) Inquiry				

Outputs	Plan	Source	Make	Deliver
Order quote (customer)				

Process Element: Receive, Configure, Enter & Validate Order	Process Element Number: D2.2
Process Element Definition	
Receive orders from the customer and enter them into a company's order processing system. Orders can be received through phone, fax, or 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**
Reliability	Perfect Order Fulfillment
Responsiveness	Customer Signature/Authorization to Order Receipt Time Order Receipt to Order Entry Complete Time
Flexibility	Upside Order Flexibility Downside Order Flexibility
Cost	Create Customer Order Costs Order Entry and Maintenance Costs
Assets	None Identified
Best Practices	**Features**
Electronic Commerce (customer visibility of stock availability, use of hand-held terminals for direct order entry, confirmation, credit approval), On-line stock check and reservation of inventory	EDI applications and integrated order management
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
Enable real-time visibility into backlog, order status, shipments, scheduled material receipts, customer credit history, and current inventory positions	None Identified
Continuous Replenishment Programs; Vendor Managed Inventory, Telemetry to automatically communicate replenishment of chemicals	Integrated demand/deployment planning to customer location driven by POS; Customer movement data
Remote (sales, customers) order entry capability	None Identified
Automatic Multi-level Credit Checking: Dollar Limits; Days Sales Outstanding; Margin Testing	Integrated Order/Financial Management
Value Pricing based on "Cost to Serve"; EDLP; Cost Plus Pricing	Activity Based Costing; Integrated Order Management by Customer by Line Item
Automated Configuration Management	Configuration

Inputs	Plan	Source	Make	Deliver
Order Rules				ED.1
Configuration Rules				ED.1
Credit History				
Contract Terms				

Outputs	Plan	Source	Make	Deliver
Booked Order				ED.3
Optional Payment				

Process Element: Reserve Resources & Determine Delivery Date	Process Element Number: D2.3
Process Element Definition	
Inventory and/or planned capacity is identified and reserved for specific orders, and a delivery date is committed and scheduled.	
Performance Attributes	**Metric**
Reliability	Delivery Performance To Customer Commit Date
Responsiveness	Order Receipt to Order Entry Complete Time
Flexibility	None Identified
Cost	Order Fulfillment Costs
Assets	Capacity Utilization
Best Practices	**Features**
Dynamic deployment based on constraint based planning and optimal scheduling	Advanced planning and scheduling logic with constraint, cost, and resource optimization
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
ATP and Product Reservation	Integration with scheduling and inventory management

Inputs	Plan	Source	Make	Deliver
Sourcing Plans	P2.4			
Production Plans	P3.4			
Delivery Plans	P4.4			
Product Availability		S		
Production Schedule			M2.1	

Outputs	Plan	Source	Make	Deliver
Order Signal	P2.1, P3.1			
Order Backlog	P4.1			
Inventory Availability/Delivery Date	P4.2			
Replenishment Signal		S2.1		
Available to Promise Date			M	
Inventory Status	P	S	M	D

Process Element: Consolidate Orders	Process Element Number: D2.4
Process Element Definition	
The process of analyzing orders to determine the groupings that result in least cost/best service fulfillment and transportation.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete to Start Manufacture Time
Flexibility	None Identified
Cost	Distribution Costs
Assets	None Identified
Best Practices	**Features**
Consolidate orders by customer, source, traffic lane, carrier, etc.	Integrated load planning and building with warehouse management

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver

Process Element: Plan & Build Loads	Process Element Number: D2.5
Process Element Definition	
Transportation modes are selected and efficient loads are built.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete to Start Manufacture Time
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	Distribution Costs
Assets	None Identified
Best Practices	**Features**
Consolidation of inbound and outbound requirements	Integrated inbound/outbound transportation planning
Build load in stop sequence (i.e. 1st truck destination loaded last, etc.)	Same as above
CRP & VMI loads optimized for utilization	Integration with CRP/VMI vendor systems

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver

Process Element: Route Shipments	Process Element Number: D2.6
Process Element Definition	
Loads are consolidated and routed by mode, lane, and location.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete to Start Manufacture Time
Flexibility	None Identified
Cost	Distribution Costs
Assets	None Identified
Best Practices	**Features**
CRP/VMI	Integrated Load Building; Routing & Scheduling with Advanced Ship Notice (ASN)
Consolidation of Carriers	Transportation Modeling and Rate Analysis
Carrier/Route Optimization based on continuous movement and consolidation/pooling	Route scheduling, carrier selection, and rating
Shipment tracking and tracing	Satellite communications & GPS

Inputs	Plan	Source	Make	Deliver
Routing Guide				
Rated Carrier Data				

Outputs	Plan	Source	Make	Deliver
Scheduled Deliveries	P			

Process Element: Select Carriers & Rate Shipments	Process Element Number: D2.7
Process Element Definition	
Specific carriers are selected by lowest cost per route and shipments are rated and tendered.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete to Start Manufacture Time
Flexibility	None Identified
Cost	Distribution Costs
Assets	None Identified
Best Practices	**Features**
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

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver

Process Element: Pick Staged Product	Process Element Number: D2.8
Process Element Definition	
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 shipping performed in the distribution center in response to an order.	
Performance Attributes	**Metric**
Reliability	On Time In Full Documentation
Responsiveness	Complete Manufacture to Order Ready for Shipment Time
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	Distribution Costs
Assets	None Identified
Best Practices	**Features**
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

Inputs	Plan	Source	Make	Deliver
Inventory Availability		S2.4		
Production Schedule			M2.1	
Finished Product Release			M2.6	

Outputs	Plan	Source	Make	Deliver
Consolidated Product				D

Process Element: Load Vehicle, Generate Shipping Documentation, Verify Credit, & Ship Product	Process Element Number: D2.9
Process Element Definition	
The series of tasks including placing product onto vehicles, generating the documentation necessary to meet internal, customer, and government needs, and sending the product to the customer.	
Performance Attributes	**Metric**
Reliability	Delivery Performance to Customer Commit Date Delivery Performance to Customer Request Date Perfect Order Fulfillment
Responsiveness	Complete Manufacture to Order Ready for Shipment Time Order Ready for Shipment to Customer Receipt of Order Time
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	Transportation Costs
Assets	Field Finished Goods Inventory Days of Supply
Best Practices	**Features**
Advanced Shipping Notices & UCC128 container labeling	Bar coding; EDI; integrated transportation/warehouse management
Integrated Credit Checking	Interface to supplier's shipping system to financials

Inputs	Plan	Source	Make	Deliver
Consolidated Product				D

Outputs	Plan	Source	Make	Deliver
Shipping Documents (Carrier)				
Delivered End Items (Customer)				

Process Element: Receive & Verify Product at Customer Site	Process Element Number: D2.10
Process Element Definition	
The process of receiving the shipment at the customer site and verifying that the order was shipped complete and that the product is of sufficient quality.	
Performance Attributes	**Metric**
Reliability	Perfect Order Fulfillment
Responsiveness	Customer Receipt of Order to Installation Complete
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
Advanced Shipping Notices & UCC128 container labeling	Bar coding; EDI; integrated transportation/warehouse management
Shipment Tracking	None Identified

Inputs	Plan	Source	Make	Deliver
Advanced Ship Notice				D

Outputs	Plan	Source	Make	Deliver

Process Element: Test & Install Product	Process Element Number: D2.11
Process Element Definition	
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**
Reliability	% Faultless Installations
Responsiveness	Customer Receipt of Order to Installation Complete
Flexibility	Upside Installation Flexibility Downside Installation Flexibility
Cost	Installation Costs
Assets	Field Finished Goods Inventory Days of Supply
Best Practices	**Features**
Joint Service Agreements to document acceptable service levels in terms of installation costs, installation cycle time, etc. This would be effective between customer and supplier, and between internal functions such as Field Service, Manufacturing, Marketing and Order Management	None Identified

Inputs	Plan	Source	Make	Deliver

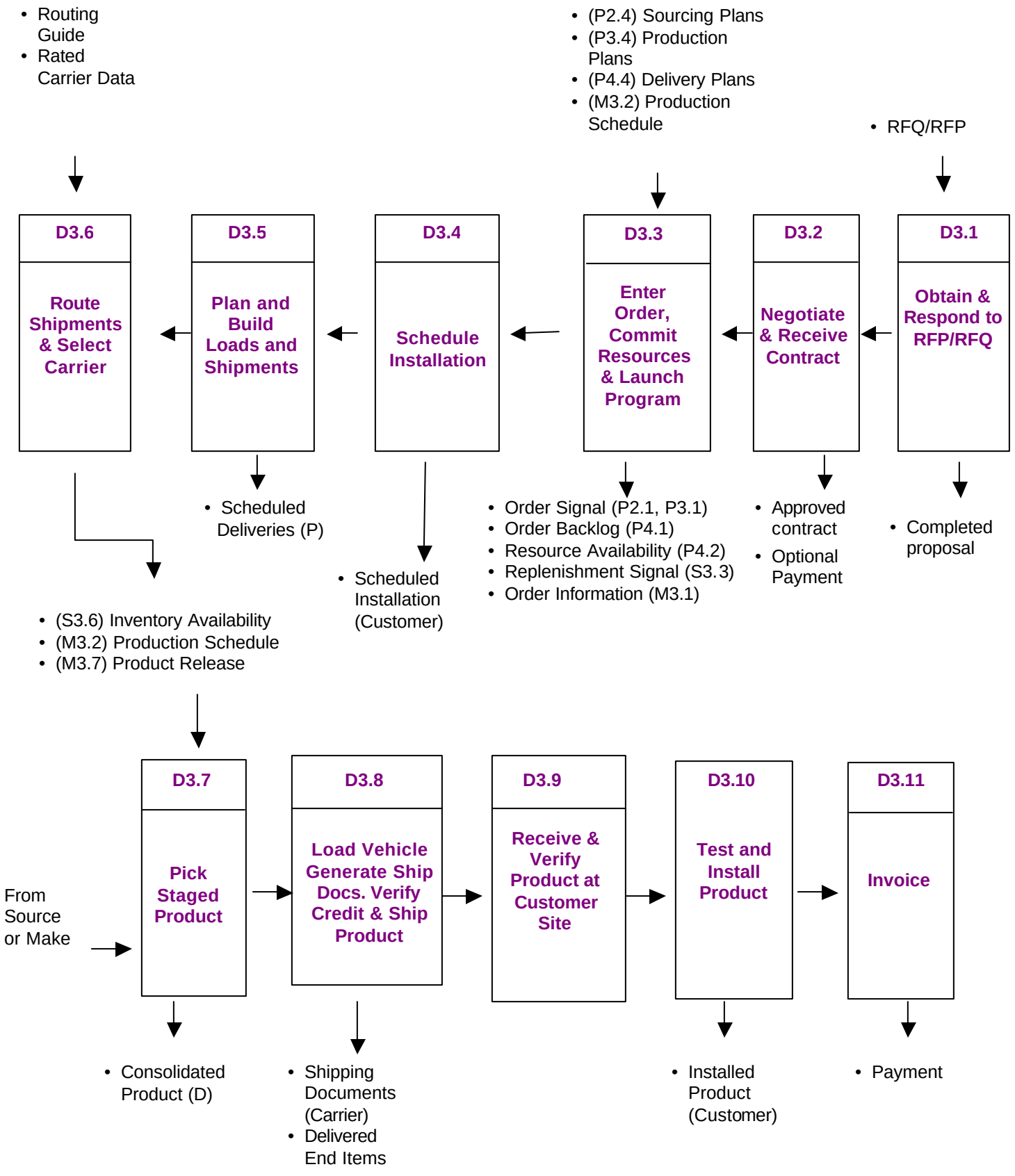
Outputs	Plan	Source	Make	Deliver
Installed Finished Product (Customer)				

Process Element: Invoice & Receive Payment	Process Element Number: D2.12
Process Element Definition	
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**
Reliability	% Faultless Invoices
Responsiveness	Deliver Cycle Time
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	Customer Invoicing/Accounting Costs
Assets	Days Sales Outstanding
Best Practices	**Features**
Utilize EDI and EFT for payment to speed closing of receivables and to reduce processing costs	EDI transaction and network services
Provide visibility to and quickly escalate delinquent accounts for resolution	Integrated accounts receivables
Electronic transfer of shipment information to finance	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Payment				

D3: Deliver Engineer-to-Order Product



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Process Category: Deliver Engineer-to-Order Product	Process Number: D3
Process Category Definition	
The process of delivering a product that is designed, manufactured, and assembled from a bill of materials that includes one or more custom parts. Design will begin only after the receipt and validation of a firm customer order.	
Performance Attributes	**Metric**
Reliability	Delivery Performance to Customer Commit Date Delivery Performance to Customer Request Date Perfect Order Fulfillment
Responsiveness	Published Delivery Cycle Time Deliver Cycle Time
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	Order Management Costs
Assets	Finished Goods Inventory Days of Supply
Best Practices	**Features**
None Identified	None Identified

Process Element: Obtain and Respond to Request for Proposal (RFP) / Request for Quote (RFQ)	Process Element Number: D3.1
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Cost	Order Management Costs
Assets	None Identified
Best Practices	**Features**
Use of CAD/CAE applications to simulate design, cost and manufacturing process	None Identified
Partnership with outside design firms to provide skills and capacity, as needed	None Identified

Inputs	Plan	Source	Make	Deliver
RFQ/RFP				

Outputs	Plan	Source	Make	Deliver
Completed proposal				

Process Element: Negotiate & Receive Contract	Process Element Number: D3.2
Process Element Definition	
The process of negotiating order details with customer (eg, price, schedule, product performance) and finalizing the contract. Optionally accept payment.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Customer Signature/Authorization to Order Receipt Time
Flexibility	Upside Order Flexibility Downside Order Flexibility
Cost	Create Customer Order Costs
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Approved contract				
Optional Payment				

Process Element: Enter Order, Commit Resources & Launch Program	Process Element Number: D3.3
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	Order Receipt to Order Entry Complete Time
Flexibility	Upside Order Flexibility Downside Order Flexibility
Cost	Order Fulfillment Costs
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver
Sourcing Plans	P2.4			
Production Plans	P3.4			
Delivery Plans	P4.4			
Production Schedule			M3.2	

Outputs	Plan	Source	Make	Deliver
Order Signal	P2.1, P3.1			
Order Backlog	P4.1			
Resource Availability	P4.2			
Replenishment Signal		S3.3		
Order Information			M3.1	

Process Element: Schedule Installation	Process Element Number: D3.4
Process Element Definition	
The process of evaluating the design and build schedules relative to customer requested installation date to determine installation schedule.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete to Start Manufacture Time
Flexibility	Upside Order Flexibility Downside Order Flexibility
Cost	Order Fulfillment Costs
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Scheduled Installation (Customer)				

Process Element: Plan & Build Loads and Shipments	Process Element Number: D3.5
Process Element Definition	
The process of scheduling simultaneous and/or consolidated shipments, and planning and building loads.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete Time to Order Ready for Shipment
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	Distribution Costs
Assets	None Identified
Best Practices	**Features**
Consolidation of inbound and outbound requirements	Integrated inbound/outbound transportation planning

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Scheduled Deliveries	P			

Process Element: Route Shipments & Select Carriers	Process Element Number: D3.6
Process Element Definition	
The process of consolidating and routing shipments by mode, lane, and location. Carriers are selected and shipments are rated.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete Time to Order Ready for Shipment
Flexibility	None Identified
Cost	Distribution Costs
Assets	None Identified
Best Practices	**Features**
CRP/VMI	Integrated Load Building; Routing & Scheduling with Advanced Ship Notice (ASN)
Consolidation of Carriers	Transportation Modeling and Rate Analysis
Carrier/Route Optimization based on continuous movement and consolidation/pooling	Route scheduling, carrier selection, and rating
Shipment tracking and tracing	Satellite communications & GPS
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

Inputs	Plan	Source	Make	Deliver
Routing Guide				
Rated Carrier Data				

Outputs	Plan	Source	Make	Deliver

Process Element: Pick Staged Product	Process Element Number: D3.7
Process Element Definition	
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 shipping performed in the distribution center in response to an order.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Order Entry Complete Time to Order Ready for Shipment Time
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	Distribution Costs
Assets	Finished Goods Inventory Days of Supply
Best Practices	**Features**
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

Inputs	Plan	Source	Make	Deliver
Inventory Availability		S3.6		
Production Schedule			M3.2	
Product Release			M3.7	

Outputs	Plan	Source	Make	Deliver
Consolidated Product				D

Process Element: Load Vehicle, Generate Shipping Documentation, Verify Credit & Ship Product	Process Element Number: D3.8
Process Element Definition	
The series of tasks including placing product onto vehicles, generating the documentation necessary to meet internal, customer, and government needs, and sending the product to the customer.	
Performance Attributes	**Metric**
Reliability	Delivery Performance to Customer Commit Date Delivery Performance to Customer Request Date Perfect Order Fulfillment
Responsiveness	Order Ready for Shipment to Customer Receipt of Order
Flexibility	Upside Shipment Flexibility Downside Shipment Flexibility
Cost	Transportation Costs
Assets	Finished Goods Inventory Days of Supply
Best Practices	**Features**
Advanced Shipping Notices & UCC128 container labeling	Bar coding; EDI; integrated transportation/warehouse management
Integrated Credit Checking	Interface to supplier's shipping system to financials

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Shipping Documents (Carrier)				
Delivered End Items				

Process Element: Receive & Verify Product at Customer Site	Process Element Number: D3.9
Process Element Definition	
The process of receiving the shipment at the customer site and verifying that the order was shipped complete and that the product is of sufficient quality.	
Performance Attributes	**Metric**
Reliability	Perfect Order Fulfillment
Responsiveness	Customer Receipt of Order to Installation Complete
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
Advanced Shipping Notices & UCC128 container labeling	Bar coding; EDI; integrated transportation/warehouse management
Shipment Tracking	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver

Process Element: Test & Install Product	Process Element Number: D3.10
Process Element Definition	
The process of preparing, testing and installing the product at the customer site. The product is fully functional upon completion.	
Performance Attributes	**Metric**
Reliability	% Faultless Installations
Responsiveness	Customer Receipt of Order to Installation Complete
Flexibility	Upside Installation Flexibility Downside Installation Flexibility
Cost	Installation Costs
Assets	Field Finished Goods Inventory Days of Supply
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver

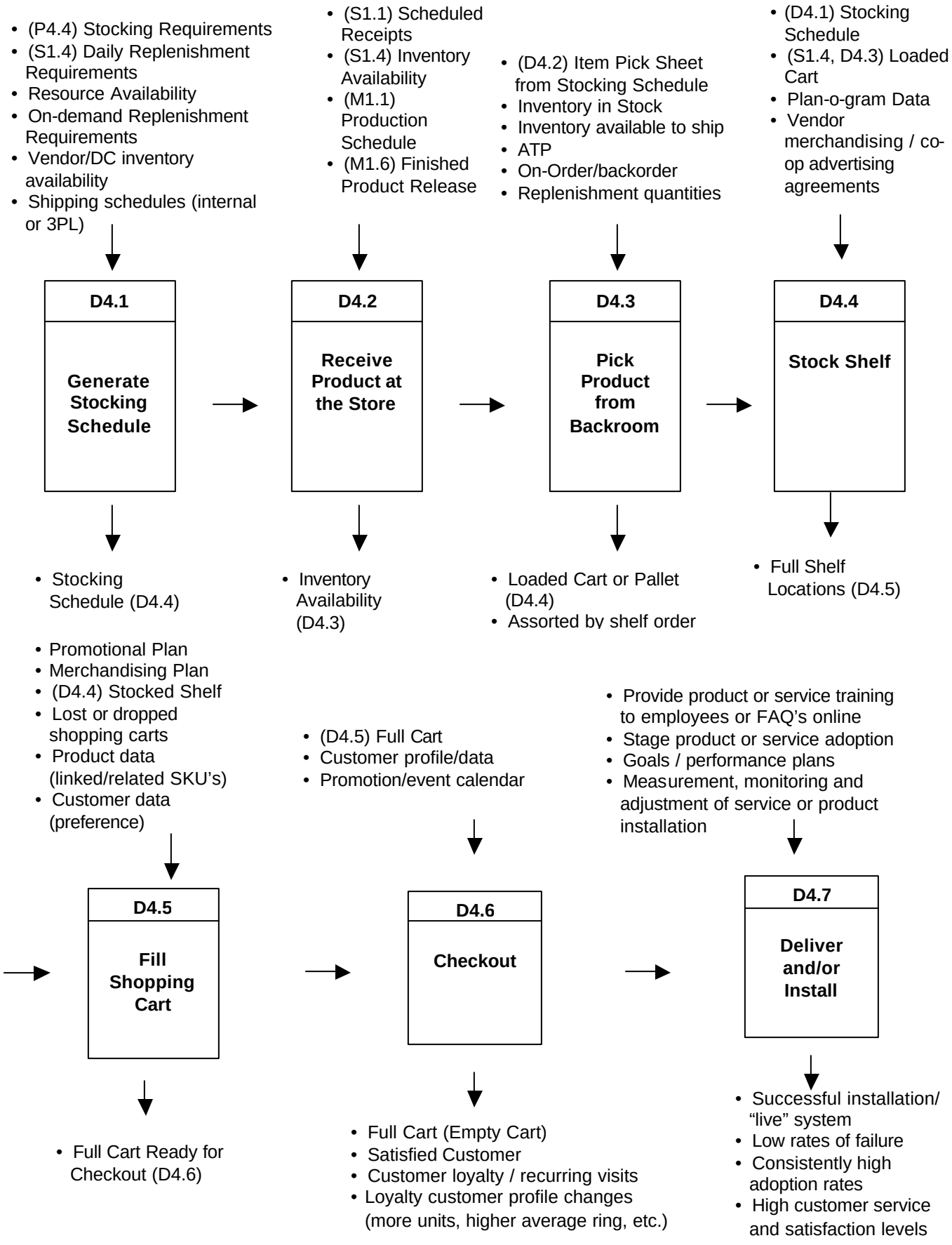
Outputs	Plan	Source	Make	Deliver
Installed Finished Product (Customer)				

Process Element: Invoice & Receive Payment	Process Element Number: D3.11
Process Element Definition	
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**
Reliability	% Of Faultless Invoices
Responsiveness	None Identified
Flexibility	Upside Delivery Flexibility Downside Delivery Flexibility
Cost	Customer Invoicing/Accounting Costs
Assets	Days Sales Outstanding
Best Practices	**Features**
Utilize EDI and EFT for payment to speed closing of receivables and to reduce processing costs	EDI transaction and network services
Provide visibility to and quickly escalate delinquent accounts for resolution	Integrated accounts receivables
Electronic transfer of shipment information to finance	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Payment				

D4: Deliver Retail Product



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Process Category: Deliver Retail Product	Process Number: D4
Process Category Definition	
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**
Reliability	Shelf Stock Out % Replenishment Accuracy Replenishment Timeliness Shelf Space To Market Share Ratio
Responsiveness	Replenishment Lead Times
Flexibility	Service Levels / Accuracy
Cost	Retail Store Cost
Assets	Days of Stock in Retail
Best Practices	**Features**
None Identified	None Identified

Process Element: Generate Stocking Schedule	Process Element Number: D4.1
Process Element Definition	
The process of scheduling resources to support item-stocking requirements.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	Number of restocking events per day
Flexibility	Cost efficiency/elasticity of shipping schedules
Cost	Items stocked per FTE Accuracy of stocking
Assets	None Identified
Best Practices	**Features**
Automated pick list	System generated pick-lists based on picking / batching rules
Push product on trailer arrival	System prioritization of items coming off trucks vs. picked from back room
Labor scheduling that matches product flow	Workforce management solution with flexible rules

Inputs	Plan	Source	Make	Deliver
Stocking Requirements	P4.4			
Daily Replenishment Requirements		S1.4		
Resource Availability				
On-demand Replenishment Requirements				
Vendor/DC inventory availability				
Shipping schedules (internal or 3PL)				

Outputs	Plan	Source	Make	Deliver
Stocking Schedule				D4.4

Process Element: Receive Product at the Store	Process Element Number: D4.2
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	Dock To Stock Cycle Time Number of restocking events per day
Flexibility	Cost efficiency/elasticity of shipping schedules
Cost	Items stocked per FTE Accuracy of stocking
Assets	None Identified
Best Practices	**Features**
Automated pick list	System generated pick-lists based on picking / batching rules
Push product on trailer arrival	System prioritization of items coming off trucks vs. picked from back room
Labor scheduling that matches product flow	Workforce management solution with flexible rules

Inputs	Plan	Source	Make	Deliver
Scheduled Receipts		S1.1		
Inventory Availability		S1.4		
Production Schedule			M1.1	
Finished Product Release			M1.6	

Outputs	Plan	Source	Make	Deliver
Inventory Availability				D4.3

Process Element: Pick Product from Backroom	Process Element Number: D4.3
Process Element Definition	
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**
Reliability	Inventory inaccuracies during pick-process
Responsiveness	Time to Pick Minimum Stock Levels
Flexibility	None Identified
Cost	Labor $ per unit—Direct Product Cost (DPC)
Assets	None Identified
Best Practices	**Features**
Automated directed picking	A pick list displayed on a handheld device that directs picks and relieves inventory from backroom locations
Staging based on in-store zones	Items are staged for re-stocking based on zones within the store. This minimizes restocking effort.
Automated Replenishment of back stock based on min-stocking levels	
Defined stocking levels & criteria	

Inputs	Plan	Source	Make	Deliver
Item Pick Sheet from Stocking Schedule				D4.2
Inventory in Stock				
Inventory available to ship				
ATP				
On-Order/backorder				
Replenishment Quantities				

Outputs	Plan	Source	Make	Deliver
Loaded Cart or Pallet				D4.4
Assorted by Shelf Order				

Process Element: Stock Shelf	Process Element Number: D4.4
Process Element Definition	
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**
Reliability	Requirements fill % In-stock %
Responsiveness	Stocking Cycle Time
Flexibility	None Identified
Cost	Put-a-way Labor Cost – Includes internal and/or external contract costs
Assets	In Store Inventory Accuracy
Best Practices	**Features**
Stocking is completed in zones	Each area of the store has its own stocking plan and items are routed specifically to that area
Off peak stocking	The majority of stocking is completed with minimal impact to or visibility from the customer
Item/shelf scanning upon put-a-way	Scan store shelves / bar codes to confirm put-a-way
Proof of performance (promotion management)	Same as above—scan using handheld and match with ad
Scan displays for promo conformance	

Inputs	Plan	Source	Make	Deliver
Stocking Schedule				D4.1
Loaded Cart		S1.4		D4.3
Plan-o-gram Data				
Vendor merchandising / co-op advertising agreements				

Outputs	Plan	Source	Make	Deliver
Full Shelf Locations				D4.5

Process Element: Fill Shopping Cart	Process Element Number: D4.5
Process Element Definition	
Typical set of tasks associated with product selection, storage and movement through to checkout.	
Performance Attributes	**Metric**
Reliability	% Item Location Accuracy
Responsiveness	None Identified
Flexibility	Rain check %
Cost	% Shrinkage
Assets	None Identified
Best Practices	**Features**
Items are relieved from inventory when item is removed from shelf	RFID, smart cart or customer self-service reduces system inventory upon item pick
Up & cross selling Substitution	Trained staff or automated systems (Internet) that recommend up-sell, cross-sell, and/or substitution
Multiple locations throughout store	Planned and tracked via a plan-o-gram system; Location specific product labeling
Measured and compared with same activity previous period (whether it is year ago, period ago, etc.)	DSS or portal tool that shows previous period performance and comparison for store management
Loyalty card data	Use for comparison to previous sales activity/track new consumers, etc.

Inputs	Plan	Source	Make	Deliver
Promotional Plan				
Merchandising Plan				
Stocked Shelf – or “full shelf locations?”				D4.4
Lost or dropped shopping carts				
Product data (linked/related SKU’s)				
Customer data (preference)				

Outputs	Plan	Source	Make	Deliver
Full Cart Ready for Checkout				D4.6

Process Element: Checkout	Process Element Number: D4.6
Process Element Definition	
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**
Reliability	Price checks per cashier shift
Responsiveness	None Identified
Flexibility	None Identified
Cost	Checkout labor - % sales
Assets	None Identified
Best Practices	**Features**
Automatic customer payment	RFID, smart cart or customer self-service charges goods to card upon store departure
Customer profile drives recognition upon checkout	
Notification of existing/future events or promotions	

Inputs	Plan	Source	Make	Deliver
Full Cart				D4.5
Customer profile/data				
Promotion/event calendar				

Outputs	Plan	Source	Make	Deliver
Full Cart (Empty Cart)				
Satisfied Customer				
Customer loyalty / recurring visits				
Loyalty customer profile changes (more units, higher average ring, etc.)				

Process Element: Deliver and/or Install	Process Element Number: D4.7
Process Element Definition	
The process of preparing and installing the product at the customer site. The product is fully functional upon completion.	
Performance Attributes	**Metric**
Reliability	% Accuracy or Failure Rates Service levels
Responsiveness	None Identified
Flexibility	Adoption rates
Cost	None Identified
Assets	None Identified
Best Practices	**Features**
Provide product or service training to employees or FAQ's online	None Identified
Stage product or service adoption	None Identified
Goals / performance plans	None Identified
Measurement, monitoring and adjustment of service or product installation	None Identified

Inputs	Plan	Source	Make	Deliver

Outputs	Plan	Source	Make	Deliver
Successful installation / "live" system				
Low rates of failure				
Consistently high adoption rates				
High customer service and satisfaction levels				

ED: Enable Deliver

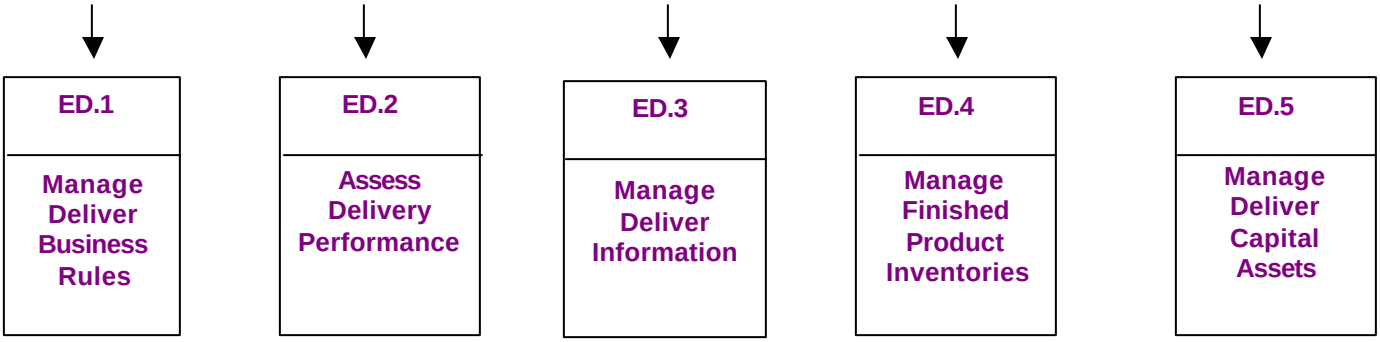
- (ED.2) Management Process Reports
- (ED.2, ED.4, ED.6) Supply Chain Performance Metrics
- (P) Planning Decision Policies
- Configuration Rules

- Benchmark Data
- (ED.4, ED.5) Delivery Performance
- (ED.8) Returns Data
- (D1.2, D2.2, D3.2) Customer Orders
- (S) Customer Carrier Contracts

- (D1.2, D2.2, D3.1) Customer Address Data, Credit History, Purchase History, Contract Status, Shipping Preferences

- (P) Inventory Rules, Product Mix and Plans, Integrated Supply Chain Plan
- (D1.8) Existing Inventory Data
- (ED.8) Returns Data
- (ED.8) Scrap Authorizations
- (ED.3) Customer Master Database
- (ED.1) Order Rules

- (P) Budgets, Approved Item Master
- (ED.2, ED.4) Supply Chain Performance Metrics
- (P, ED.4) Inventory Rules
- (ED.1) Order Rules



- Order Rules (D1.2, D2.2, D3.2, ED.4, ED.5)
- Configuration Rules (D2.2)

- Management Process Reports (ED.1)
- Supply Chain Performance Metrics (P, ED.1, ED.5)
- Customer Service Requirements (P, ED.6)

- Customer Master Database/ Up to Date (ED.4)

- Inventory Target Levels (P)
- Inventory Rules (ED.5)
- Supply Chain Performance Metrics (P, ED.1, ED.5)
- Delivery Performance (ED.2)

- Warehouse Operating Constraints (P)
- Delivery Performance (ED.2)

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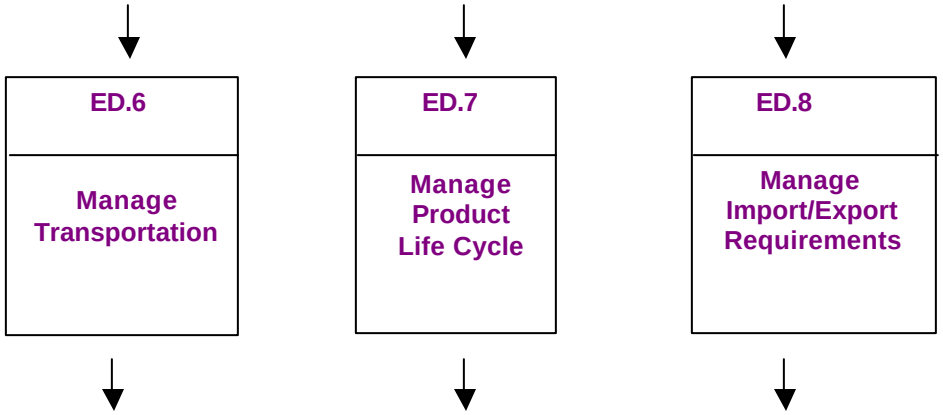
ED: Enable Deliver

- Air, Ground… Carrier Rate Tables
- (ED.2) Customer Service Requirements
- (P) Standard Practices/Rules
- (S) Contract Carrier Rates
- Projected Delivery Requirements (M)
- (D1.2, D2.2, D3.2) Customer Order Size, Weight & Freight Class

- (P) Product Mix and Plans, Revised Business Assumptions, Budgets, Source of Products
- (D1.2, D2.2, D3.2) Location of Customers

- Government Regulations
- (D1.10, D2.9, D3.8) Shipping History
- (S1.2, S2.2, S3.4) Receipt History
- Tariffs & Duties



- Shipping Parameters & Documentation (D1.10, D2.9, D3.8)
- Supply Chain Performance Metrics (P, ED.1)

- Enterprise Distribution Model (P)

- Shipping Export Parameters & Documentation (D1.10, D2.9, D3.8)
- Government Constraints (P, ED.7)
- Duty Drawback Claims

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Enable Process: Manage Deliver Business Rules	Process Number: ED.1
Enable Process Definition	
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**
Reliability	# Orders requiring intervention due to rule violation
Responsiveness	Rule implementation time
Flexibility	None identified
Cost	Rule management cost Cost of non-conformance
Assets	None Identified
Best Practices	**Features**
Integrated edit at order entry time	Customer Master Record
On-line rule base	None Identified

Inputs	Plan	Source	Make	Deliver
Management Process Reports				ED.2
Supply Chain Performance Metrics				ED.2, ED.4, ED.6
Planning Decision Policies	P			
Configuration Rules				

Outputs	Plan	Source	Make	Deliver
Order Rules				D1.2, D2.2, D3.2, ED.4, ED.5
Configuration Rules				D2.2

Enable Process: Access Delivery Performance	Process Number: ED.2
Enable Process Definition	
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**
Reliability	Perfect Order fulfillment for the provider
Responsiveness	None Identified
Flexibility	None Identified
Cost	Administration cost ($ as % of Delivery $)
Assets	Transportation Assets
Best Practices	**Features**
Real time package tracking	Tracking and tracing
Customer initiated package tracking	WEB based Shared systems

Inputs	Plan	Source	Make	Deliver
Benchmark Data				
Delivery Performance				ED.4, ED.5
Returns Data				ED.8
Customer Orders				D1.2, D2.2, D3.2
Customer Carrier Contracts		S		

Outputs	Plan	Source	Make	Deliver
Management Process Reports				ED.1
Supply Chain Performance Metrics	P			ED.1, ED.5
Customer Service Requirements	P			ED.6

Enable Process: Manage Deliver Information	Process Number: ED.3
Enable Process Definition	
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**
Reliability	Age of data - #days since last effective use Ratio of active customer data/Inactive customer data
Responsiveness	Time to update customer records and status
Flexibility	None Identified
Cost	Cost of acquisition % of distribution cost Cost of Capital Systems or 3rd Party services
Assets	None Identified
Best Practices	**Features**
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 access to online tracking of order status and shipping information	Internet-enabled package/shipment tracking
Comprehensive history of customer interactions including order history, claims, problems, etc.	None Identified
Customer Service data validation including geo-coding	None Identified

Inputs	Plan	Source	Make	Deliver
Customer Address Data, Credit History, Purchase History, Contract Status, Shipping Preferences				D1.2, D2.2, D3.1

Outputs	Plan	Source	Make	Deliver
Customer Master Database - Up to Date				ED.4

Enable Process: Manage Finished Goods Inventories	Process Number: ED.4
Enable Process Definition	
The process of establishing and maintaining finished goods, inventory limits or levels, replenishment models, ownership, product mix, stocking locations	
Performance Attributes	**Metric**
Reliability	Fill Rate (% filled of an order)
Responsiveness	None Identified
Flexibility	None Identified
Cost	Inventory carrying cost $ Days of inventory
Assets	Inventory Days of Supply
Best Practices	**Features**
Periodic review of metrics and strategy with comparisons to industry benchmarks	Real time view of data.
Real time data on current status.	Dynamic calculation of safety stock based on actual sales
Cycle Counting	None Identified

Inputs	Plan	Source	Make	Deliver
Inventory Rules, Product Mix and Plans, Integrated Supply Chain Plan	P			
Existing Inventory Data				D1.8
Returns Data				ED.8
Scrap Authorizations				ED.8
Customer Master Database				ED.3
Order Rules				ED.1

Outputs	Plan	Source	Make	Deliver
Inventory Target Levels	P			
Inventory Rules				ED.5
Supply Chain Performance Metrics	P			ED.1, ED.5

Enable Process: Manage Deliver Capital Assets	Process Number: ED.5
Enable Process Definition	
Acquisition, maintenance, and disposition of order management, warehouse and transportation capital assets. Determine material handling (inventory) pick pack & ship methods (inventory), and equipment.	
Performance Attribute	**Metric**
Reliability	% Perfect customer order delivery % Capacity Utilization % Obsolete or inactive inventory Inventory Accuracy by location (% Items whose physical count and location matched system's count and location) % Damaged products receipts and % damaged customer shipments
Responsiveness	None Identified
Flexibility	None Identified
Cost	Warehouse Distribution Cost Inventory Carrying Cost Cost of Obsolete Inventory Cost of Damaged Inventory
Assets	Inventory turns per year
Best Practices	**Features**
Standard Operating Procedures and Methodology	Real-time System Directed Task Scheduling and Management
Measure Customer Service	Advanced Shipping Notices (ASN) Parcel and Container Routing and Rating Compliance Labeling Real time shipment tracking
Cycle Counting	WMS-real time inventory tracking
Removal of Obsolete Stock	Automated Calculation of ABC Velocity Movement
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

Inputs	Plan	Source	Make	Deliver
Budgets, Approved Item Master	P			
Supply Chain Performance Metrics				ED.2, ED.4
Inventory Rules	P			ED.4
Order Rules				ED.1

Outputs	Plan	Source	Make	Deliver
Warehouse Operating Constraints	P			
Delivery Performance				ED.2

Enable Process: Manage Transportation	Process Number: ED.6
Enable Process Definition	
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**
Reliability	Frequency of parameter updates Number of data sources for data collection
Responsiveness	Speed at which parameters (eg, rates) are updated. Dock-to-Dock times (lane specific)
Flexibility	None Identified
Cost	Data maintenance costs
Assets	Empty-to-loaded backhaul mile index Equipment utilization rates (hours) Equipment utilization rates (product contribution margin) Vehicle maintenance costs
Best Practices	**Features**
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 Appointment Scheduling for Pickup and Delivery of Customer Shipments Measurement of Carrier Performance for On-time Delivery and Completeness Real-time Optimized Shipment Method Selection (Air Parcel, Ground Parcel, LTL, etc.) Based on Customer Service Requirements Real-time Shipment Tracking, (via Internet) Electronic Manifest and Electronic Billing Automated Documentation for International Shipments Manage Information across 100% of shipments Capture and maintain mode specific data	Transportation Management System (TMS) Maintenance Management
Internet Pooling (Electronic brokerage of shipments	Rating & Routing
Backhaul trading exchange	Pooling

Inputs	Plan	Source	Make	Deliver
Air, Ground... Carrier Rate Tables				
Customer Service Requirements				ED.2
Standard Practices/Rules	P			
Contract Carrier Rates		S		
Customer Order Size, Weight & Freight Class				D1.2, D2.2, D3.2
Projected Delivery Requirements			M	

Outputs	Plan	Source	Make	Deliver
Shipping Parameters & Documentation				D1.10, D2.9, D3.8
Supply Chain Performance Metrics	P			ED.1

Enable Process: Manage Product Life Cycle	Process Number: ED.7
Enable Process Definition	
The process of defining and maintaining the distribution channel/ network for a specific product line (no capital asset or transportation management).	
Performance Attributes	**Metric**
Reliability	Total distribution cost as a % of revenue Frequency of analysis (monthly, annual, 5 year planning cycle)
Responsiveness	None Identified
Flexibility	None Identified
Cost	Acquisition cost for operational systems (# SKU, #Customer orders, etc.) Cost to maintain the fixed assets for the distribution network
Assets	Distribution capital cost
Best Practices	**Features**
Integrated Facility Management	None Identified
Operations and Network Analysis	None Identified
Standard Operating Procedures and Methodology	None Identified

Inputs	Plan	Source	Make	Deliver
Product Mix and Plans, Revised Business Assumptions, Budgets, Source of Products	P			
Location of Customers				D1.2, D2.2, D3.2

Outputs	Plan	Source	Make	Deliver
Enterprise Distribution Model	P			

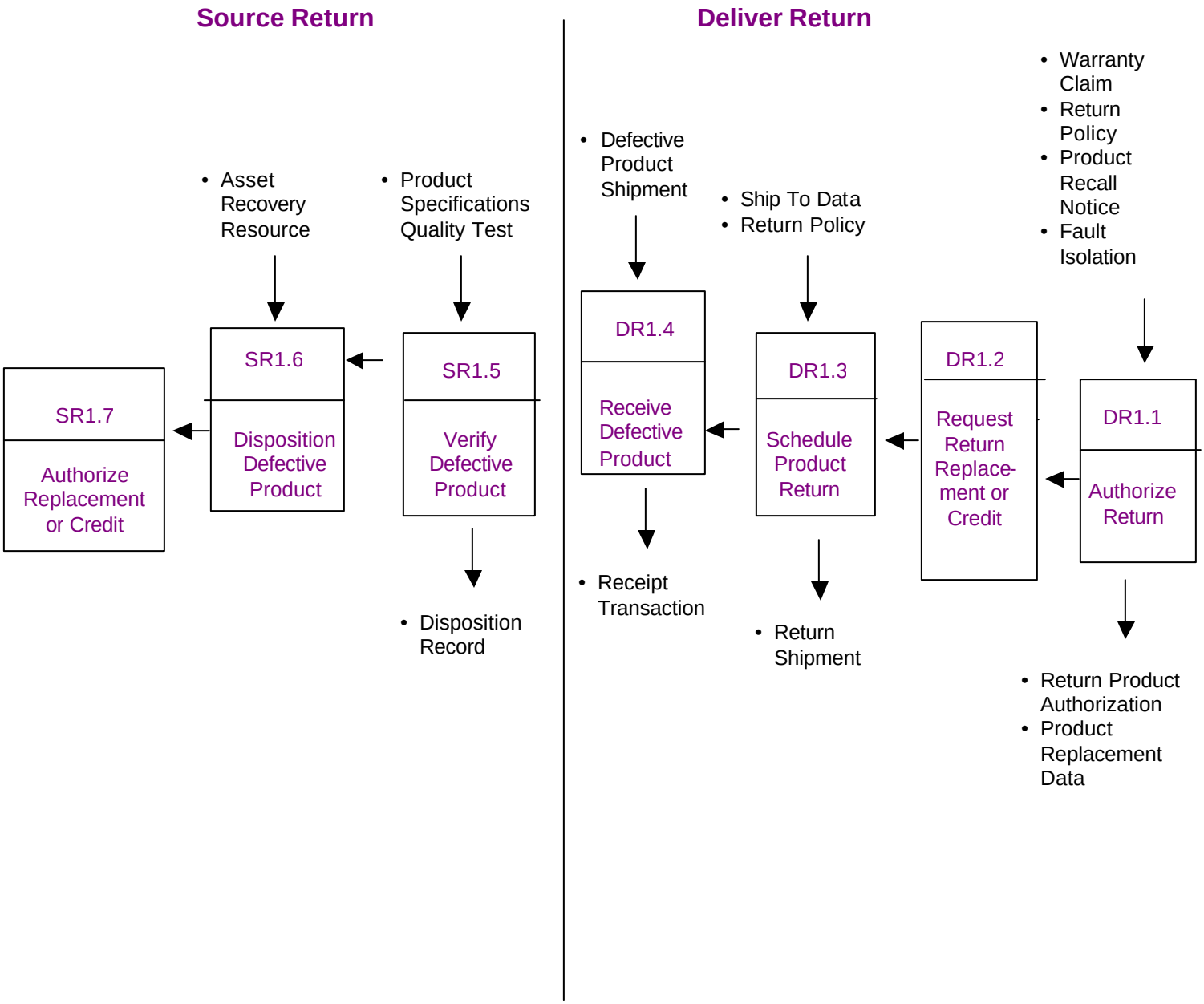
Enable Process: Manage Export/Import Requirements	Process Number: ED.8
Enable Process Definition	
The process of recording and maintaining regulations and rates, which constrain the ordering and delivering of product.	
Performance Attributes	**Metric**
Reliability	Compliance with multi-country government regulations1 Minimized delays in-transit caused by customs intervention2
Responsiveness	Customs clearance cycle time Export shipment processing time
Flexibility	None Identified
Cost	Duty tax control Cost of compliance
Assets	None Identified
Best Practices	**Features**
	Multi-country Export/Import documentation compliance
Documents generated automatically during shipment preparation. Direct connection to customs clearance Direct Transfer of documents to Recipient and Forwarder	Electronic documentation submission via EDI and/or Internet
Assessing export/import requirements during time of product development/manufacture	None Identified
Ability to track component/sub-component manufacturing country of origin	Component/lot tracking (lot trace-ability)

Inputs	Plan	Source	Make	Deliver
Government Regulations				
Shipping History				D1.10, D2.9, D3.8
Receipt History		S1.2, S2.2, S3.4		
Tariffs & Duties				

Outputs	Plan	Source	Make	Deliver
Shipping Export Parameters & Documentation				D1.10, D2.9, D3.8
Government Constraints	P			ED.7
Duty Drawback Claims				

RETURN

R1: Return Defective Product



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Process Category: Return Defective Product	Process Number: R1
Process Category Definition	
The return and disposition of defective products as defined by the warranty claims, product recall, non-conforming product and/or other similar policies including appropriate replacement.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Warranty Cost
Assets	Days of Return Inventory
Best Practices	**Features**

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return

Process Element: Authorize Return	Process Element Number: DR1.1
Process Element Definition	
The process of validating, approving, recording, warranty claims, product recalls and non-conforming product including the processing of product replacement data and/or other similar policies including appropriate replacement.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Receiving &Product storage cost as a % of Product Return Costs Create Return Product Authorization Costs
Assets	Value of return products
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Warranty Claim					
Return Policy					
Product Recall Notice					
Fault Isolation					

Outputs	Plan	Source	Make	Deliver	Return
Return Product Authorization					
Product Replacement Data					

Process Element: Request Return Replacement or Credit	Process Element Number: DR1.2
Process Element Definition	
The process and actions required determining return replacement or credit.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return

Process Element: Schedule Defective Product Return	Process Element Number: DR1.3
Process Element Definition	
The process of scheduling and managing the execution of the individual return deliveries of product against an existing warranty claim, product recall and non-conforming product, and/or other similar policies including appropriate replacement.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Return Product Management and Planning Costs as a % of Product Return Costs
Assets	Return Product Days of Supply (DOS)
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Ship to Data					
Return Policy					

Outputs	Plan	Source	Make	Deliver	Return
Return Shipment					

Process Element: Receive Defective Product	Process Element Number: DR1.4
Process Element Definition	
The process of receiving and recording a defective product against a warranty claim and/or other similar policies including appropriate replacement.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Order Management Costs to Return Product into the Supply Chain Warranty Costs
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Defective Product Shipment					

Outputs	Plan	Source	Make	Deliver	Return
Receipt Transaction					

Process Element: Verify Defective Product	Process Element Number: SR1.5
Process Element Definition	
The process and actions required determining the cause of defective product conformance to requirements and recording disposition profile.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Verification Costs as a % of Product Return Costs
Assets	None Identified
Best Practices	**Features**
Product Specifications	None Identified
Quality Test Procedures	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Product Specifications Quality Test					

Outputs	Plan	Source	Make	Deliver	Return
Disposition Record					

Process Element: Disposition Defective Product	Process Element Number: SR1.6
Process Element Definition	
The process and actions required to bring the defective product back to operational and specifications.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Total production employment Value added productivity Warranty Costs Disposal Costs
Assets	Capacity utilization
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Asset Recovery Resource					

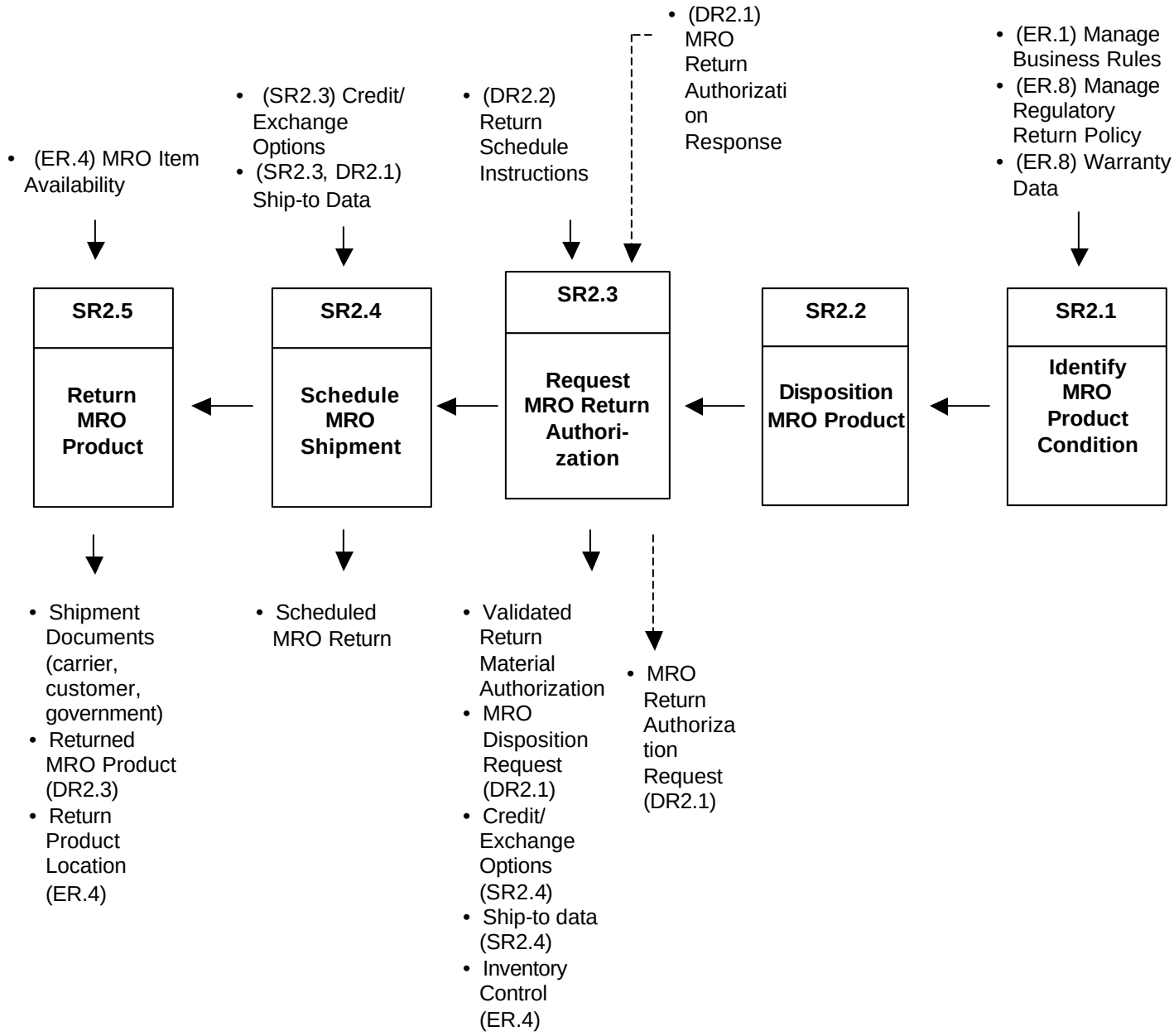
Outputs	Plan	Source	Make	Deliver	Return
Asset Disposition Record					

Process Element: Authorize Replacement Or Credit	Process Element Number: SR1.7
Process Element Definition	
The process and actions required to authorize deliver of replacement product or credit to customer	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return

SR2: Source Return MRO Product



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Process Category: Source Return MRO Product	Process Number: SR2
Process Category Definition	
The process, initiated by the customer, of returning maintenance, repair, and overhaul items to a service provider. Process includes: customer identification that an action is required and determining what that action should be, communicating with the service provider, generating return documentation, and physically returning or disposing of the product.	
Performance Attributes	**Metric**
Reliability	% of MRO Source Returns Processed Correct
Responsiveness	Total Source Return cycle time
Flexibility	Cycle Time And Cost To Implement New Or Modify Existing Return Criteria, Scheduling Rules, Delivering Or Transferring Rules
Costs	Total Source Return Costs
Assets	Value of Unserviceable MRO Inventory/ Total MRO Inventory Value
Best Practices	**Features**
None Identified	None Identified

Process Element: Identify MRO Product Condition	Process Number: SR2.1
Process Element Definition	
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**
Reliability	Total Number Of Confirmed MRO Conditions / Total Number of MRO Service Requests Initiated
Responsiveness	Cycle Time From Problem Identification To Condition Confirmation
Flexibility	Cycle Time To Change Condition Criteria
Costs	Cost of Identifying the MRO Condition as a % of Total Source Return Cost
Assets	Value of Unserviceable MRO Inventory In Identification Stage/ Total MRO Inventory Value
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Manage Business Rules					ER.1
Manage Regulatory Return Policy					ER.8
Warranty Data					ER.8

Outputs	Plan	Source	Make	Deliver	Return

Process Element: Disposition MRO Product	Process Number: SR2.2
Process Element Definition	
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**
Reliability	% Identified MRO Products Returned To Service
Responsiveness	Cycle Time To: Reach Return Authorization, Return To Service Or Discard Decision
Flexibility	Time and Cost Related To Expediting The Disposition Time and Cost Related To Responding To An Increase In Disposition Demand
Costs	MRO Disposition Costs As % Total Source Return Cost
Assets	Value of Unserviceable MRO Inventory In Disposition Stage/ Total MRO Inventory Value (Inventory Awaiting Disposition)
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return

Process Element: Request MRO Return Authorization	Process Number: SR2.3

Process Element Definition
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
Reliability	% Authorization Requests Transmitted Error-Free / Total Authorizations Requested
Responsiveness	Cycle Time From The Customer Identifying The Need For A Return Authorization To The Authorization's Receipt By The Service Provider
Flexibility	Cycle Time To Incorporate Changes In Return Authorization Processing
Costs	Cost per Request Authorization Ratio of Authorization Cost To Total Source Return Cost
Assets	Value of Unserviceable MRO Inventory In Request Return Authorization Stage/ Total MRO Inventory Value (Inventory Awaiting Return Authorization)
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
MRO Return Authorization Response					DR2.1
Return Schedule Instructions					DR2.2

Outputs	Plan	Source	Make	Deliver	Return
MRO Return Authorization Request					DR2.1
Validated Return Material Authorization					
MRO Disposition Request					DR2.1
Credit/ Exchange Options					SR2.4
Ship-to data					SR2.4
Inventory Control					ER.4

Process Element: Schedule MRO Shipment	Process Number: SR2.4
Process Element Definition	
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**
Reliability	% shipping schedules that support customer required return by date
Responsiveness	Cycle Time From Return Authorization To Scheduled Shipment Pickup Cycle Time From Return Authorization To Actual Shipment Pickup
Flexibility	Cycle time to update changes to shipment schedule
Costs	% MRO Scheduling Cost to Total Source Return Cost
Assets	Value of Unserviceable MRO inventory in Scheduling Stage/ Total MRO Inventory Value
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Credit/ Exchange Options					SR2.3
Ship-to Data					SR2.3, DR2.1

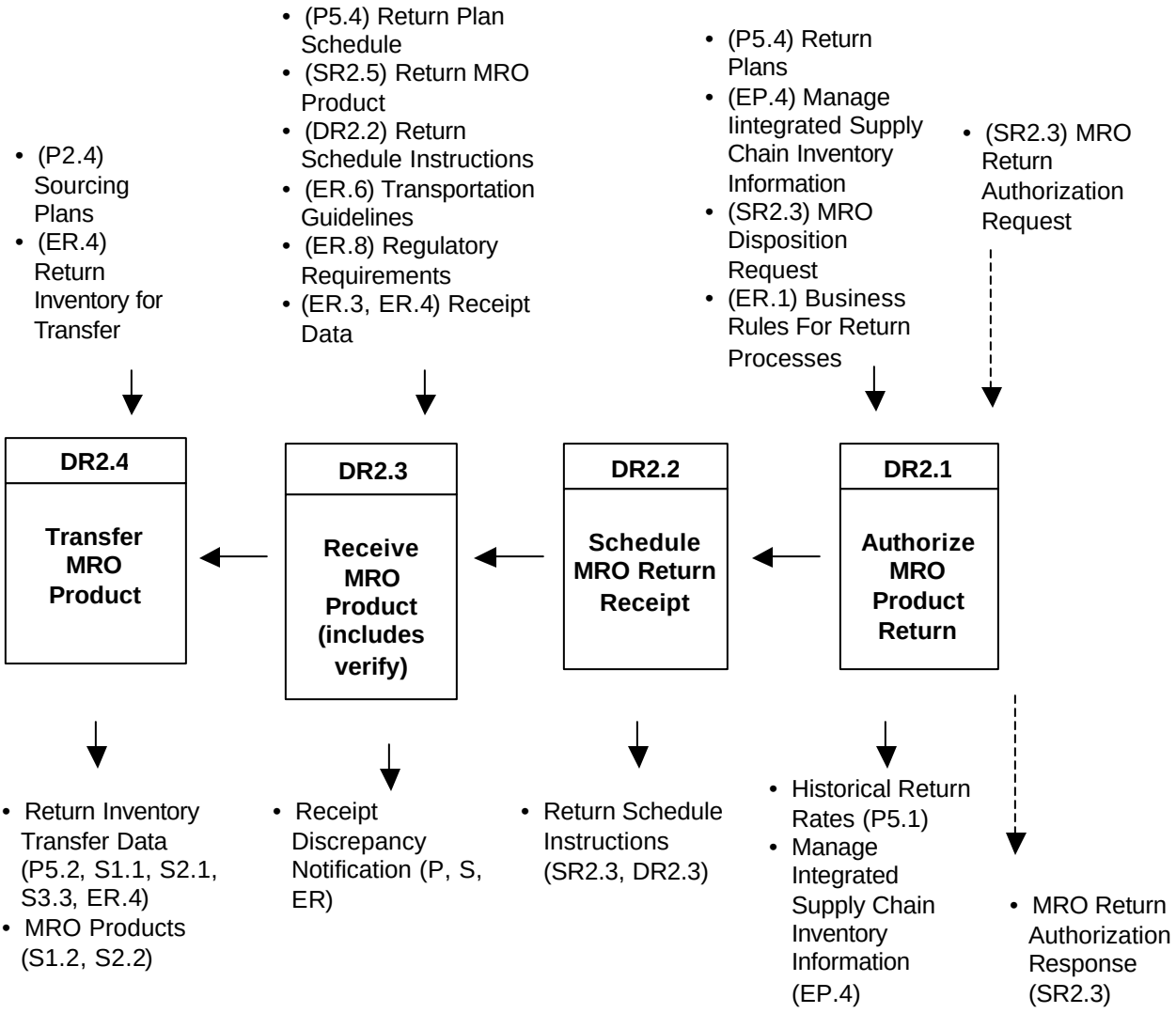
Outputs	Plan	Source	Make	Deliver	Return
Scheduled MRO Return					

Process Element: Return MRO Product	Process Number: SR2.5
Process Element Definition	
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**
Reliability	% Error-free Returns Shipped Return Shipments Shipped On Time
Responsiveness	Cycle Time From Packaging The Product For Shipment To Receipt Of Product At The Service Provider
Flexibility	None Identified
Costs	Cost Per Request Authorization Return Transportation Costs
Assets	Value of Unserviceable MRO Inventory In Physical Return and Transportation Stage/ Total MRO Inventory Value
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
MRO Item Availability					ER.4

Outputs	Plan	Source	Make	Deliver	Return
Shipment Documents (carrier, customer, government)					
Returned MRO Product					DR2.3
Return Product Location					ER.4

DR2: Deliver Return MRO Product



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Process Category: Deliver Return MRO Product	Process Number: DR2
Process Category Definition	
The processes of the service provider authorizing and scheduling the MRO return product and the physical receipt of the item by the service provider and their transfer of the item for final disposition determination. The process includes communication between the customer and service provider and the generation of associated documentation.	
Performance Attributes	**Metric**
Reliability	% of MRO Deliver Returns Processed Correct
Responsiveness	Total Deliver Return Cycle Time
Flexibility	Cycle time and cost to implement new or modify existing return authorization criteria, scheduling rules, delivering or transferring rules
Costs	Total cost associated with Deliver Return activities
Assets	Value of Unserviceable MRO Inventory in Deliver Return Process/ Total MRO Inventory Value
Best Practices	**Features**
None Identified	None Identified

Process Element: Authorize MRO Product Return	Process Number: DR2.1
Process Element Definition	
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**
Reliability	None Identified
Responsiveness	Response Cycle Time
Flexibility	None Identified
Costs	Cost per request authorization Ratio of authorization cost to total deliver return costs
Assets	Value of Unserviceable MRO Inventory In Scheduling Stage/ Total MRO Inventory Value
Best Practices	**Features**
Prognostic/Diagnostic	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Return Plans	P5.4				
Manage Iintegrated Supply Chain Inventory Information	EP.4				
MRO Return Authorization Request					SR2.3
MRO Disposition Request					SR2.3
Business Rules For Return Processes					ER.1

Outputs	Plan	Source	Make	Deliver	Return
Historical Return Rates	P5.1				
Manage Integrated Supply Chain Inventory Information	EP.4				
MRO Return Authorization Response					SR2.3

Process Element**: Schedule MRO Return Receipt**	**Process Number: DR2.2**
Process Element Definition	
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**
Reliability	% of Return Schedules That Are Generated Within Supplier's Lead Time
Responsiveness	Return Authorization Schedule Creation Cycle Time
Flexibility	Cycle Time To Update Changes To Shipment Schedule
Costs	MRO Deliver Return Costs
Assets	Value of Unserviceable MRO Inventory In Scheduling Stage/ Total MRO Inventory Value
Best Practices	**Features**
None Identified	None Identified

Inputs	**Plan**	**Source**	**Make**	**Deliver**	**Return**

Outputs	**Plan**	**Source**	**Make**	**Deliver**	**Return**
Return Schedule Instructions					SR2.3, DR2.3

Process Element**: Receive MRO Product**	**Process Number: DR2.3**
Process Element Definition	
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**
Reliability	% Orders/ Lines Received Damage Free % orders/ Lines Received Complete % orders/ Lines Received With On-Time Scheduled Receipts % orders/ Lines Received With Correct Shipping Documents
Responsiveness	Receiving Cycle Time
Flexibility	% Receipts Received without Item and Quantity Verification
Costs	Receiving Costs as a % of MRO Costs
Assets	Value of Unserviceable MRO Inventory In Receiving Stage/ Total MRO Inventory Value
Best Practices	**Features**
None Identified	None Identified

Inputs	**Plan**	**Source**	**Make**	**Deliver**	**Return**
Return Plan Schedule	P5.4				
Return MRO Product					SR2.5
Return Schedule Instructions					DR2.2
Transportation Guidelines					ER.6
Regulatory Requirements					ER.8
Receipt Data					ER.3, ER.4

Outputs	**Plan**	**Source**	**Make**	**Deliver**	**Return**
Receipt Discrepancy Notification	P	S			ER

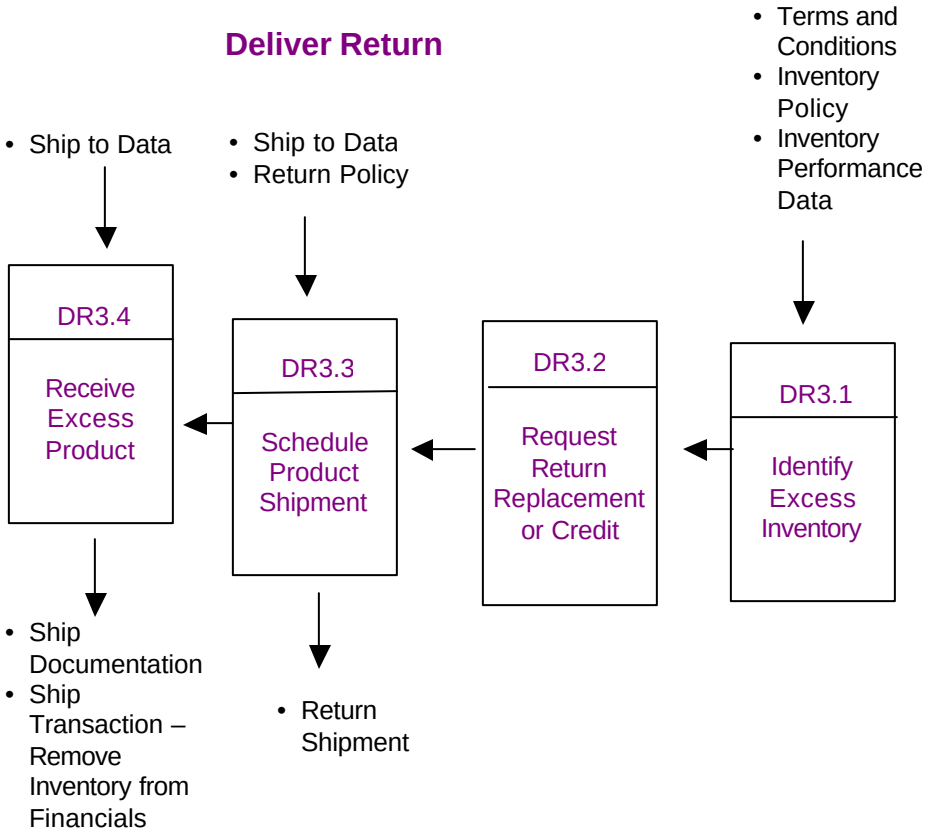
Process Element**: Transfer MRO Product**	**Process Number: DR2.4**
Process Element Definition	
The process where the service provider transfers the MRO product to the appropriate process to implement the disposition decision.	
Performance Attributes	**Metric**
Reliability	% Lost or Damaged During Transfer % Product Transfer Without Transaction Errors
Responsiveness	Cycle Time For The Transfer Process
Flexibility	Time and Cost To Exercise The Transfer
Costs	Transfer and Product Storage Costs
Assets	Value of Unserviceable MRO Inventory In Transfer To Storage Stage/ Total MRO Inventory Value
Best Practices	**Features**
None Identified	None Identified

Inputs	**Plan**	**Source**	**Make**	**Deliver**	**Return**
Sourcing Plans	P2.4				

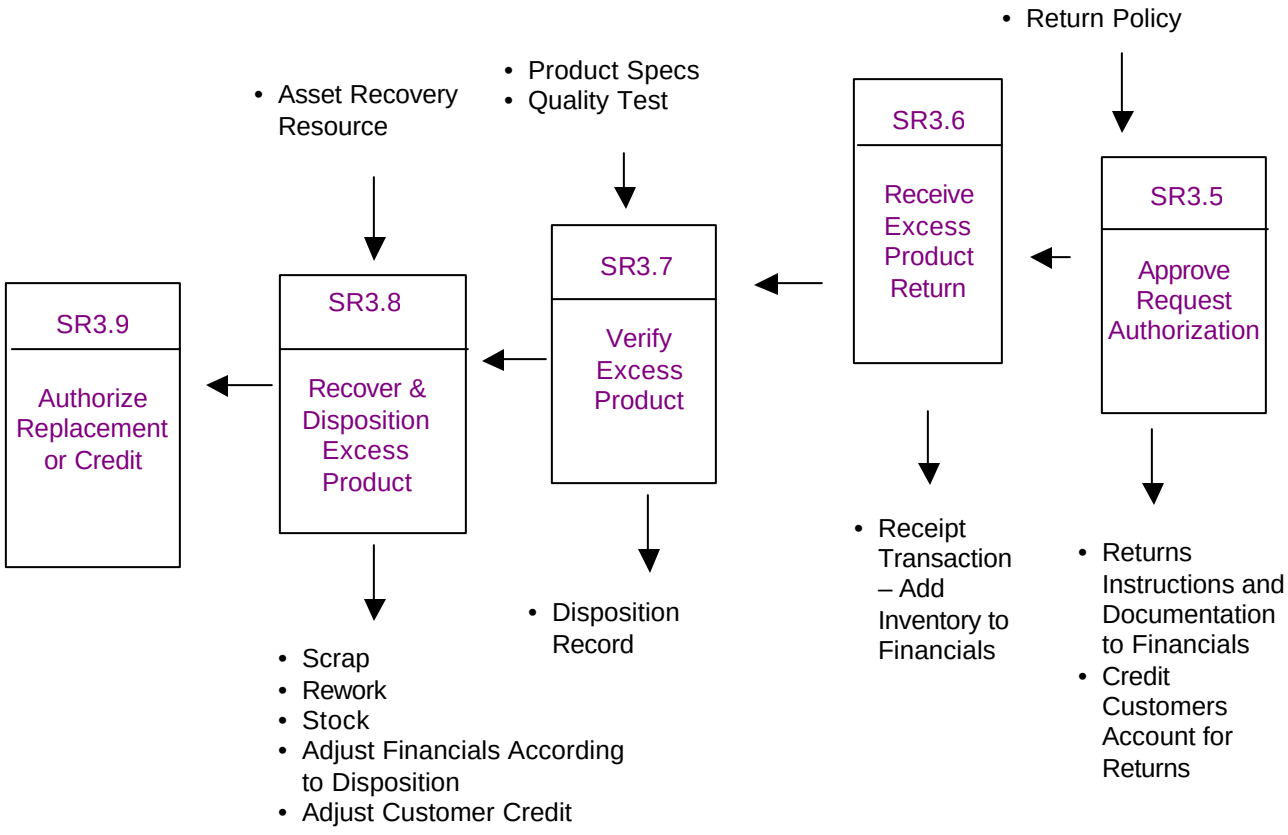
Outputs	**Plan**	**Source**	**Make**	**Deliver**	**Return**
Return Inventory Transfer Data	P5.2	S1.1, S2.1, S3.3			ER.4
MRO Products		S1.2, S2.2			

R3: Return Excess Product

Deliver Return



Source Return



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Process Category: Return Excess Product	Process Number: R3
Process Category Definition	
The return of excess inventory and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Return Costs
Assets	Days of Supply Days of Obsolete Supply
Best Practices	**Features**
None Identified	None Identified

Process Element: Request Return Authorization	Process Element Number: DR3.1
Process Element Definition	
The process of validating, approving, and recording a Return Product Authorization (RPA) for excess inventory and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Create Return Product Authorization Costs Return Order Entry and Maintenance Costs
Assets	Value of Return Product
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Terms and Conditions					
Inventory Policy					
Inventory Performance Data					

Outputs	Plan	Source	Make	Deliver	Return

Process Element: Request Return Replacement or Credit	Process Element Number: DR3.2
Process Element Definition	
The process and actions required determining return replacement or credit.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return

Process Element: Schedule Excess Product Return	Process Element Number: DR3.3
Process Element Definition	
Scheduling and managing the execution of the individual return deliveries of product against an existing RPA.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Return Product Management and Planning Costs as a % of Product Return Costs
Assets	Return Product Days of Supply
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Ship to Data					
Return Policy					

Outputs	Plan	Source	Make	Deliver	Return
Return Shipment					

Process Element: Receive Excess Product	Process Element Number: DR3.4
Process Element Definition	
The process of recording a physical receipt of Excess product and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract against an RPA	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Order Management Costs to Return Product into the Supply Chain RPA Costs
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Ship to Data					

Outputs	Plan	Source	Make	Deliver	Return
Ship Documentation					
Ship Transaction To Remove Inventory From Financials					

Process Element: Approve Request Authorization	Process Element Number: SR3.5
Process Element Definition	
The process and actions required determining excess product and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract for conformance to requirements, determining disposition profile and establishing an RPA.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Cost Per Request Authorizations
Assets	None Identified
Best Practices	**Features**
Product Specifications	None Identified
Quality Test Procedures	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Return Policy					

Outputs	Plan	Source	Make	Deliver	Return
Returns Instructions and Documentation to Financials					
Credit Customers Account For Return					

Process Element: Receive Excess Product Return	Process Element Number: SR3.6
Process Element Definition	
The process of recovering excess product and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract, as available inventory and disposition excess not usable for sale.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Receiving Costs as a % of Product Return Costs
Assets	DOS of Return Product
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Receipt transaction to add inventory to financials					

Process Element: Verify Excess Product	Process Element Number: SR3.7
Process Element Definition	
The process of verifying excess product and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract as available inventory and disposition excess not usable for sale.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	Verification Costs as a % of Product Return Costs
Assets	Excess DOS Obsolete DOS
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Product Specs					
Quality Test					

Outputs	Plan	Source	Make	Deliver	Return
Disposition Record					

Process Element: Recover and Disposition Excess Product	Process Element Number: SR3.8

Process Element Definition
The process of recovering excess and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract product as available inventory and disposition excess not usable for sale.

Performance Attributes	Metric
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Asset Recovery Resource					

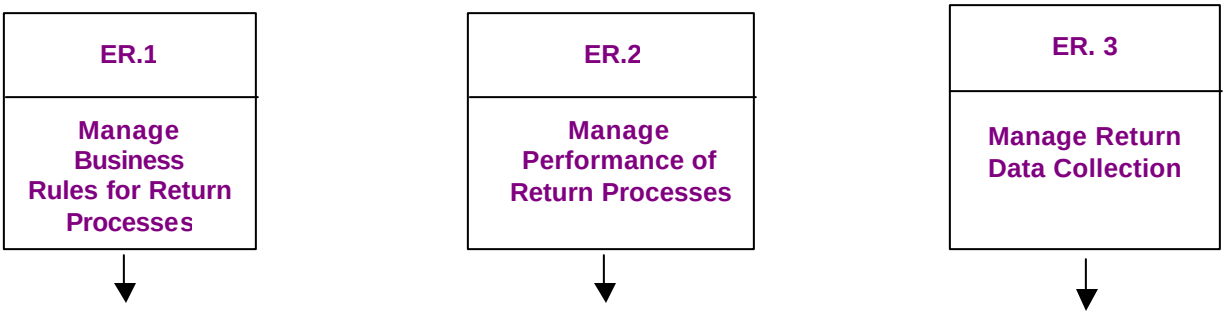
Outputs	Plan	Source	Make	Deliver	Return
Scrap					
Rework					
Stock					
Adjust Financials According to Disposition					
Adjust Customer Credit					

Process Element: Authorize Replacement Or Credit	Process Element Number: SR3.9
Process Element Definition	
The process and actions required to authorize deliver of replacement product or credit to customer	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return

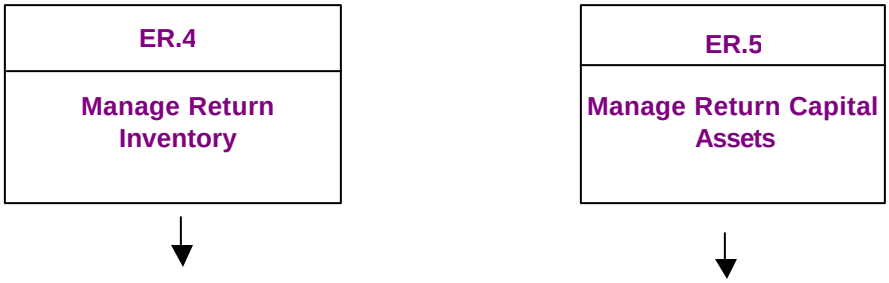
ER: Enable Return



- Business Rules (P5.1, P5.2)

- Capabilities of the Return Processes (P5.2)

- Data about Return Capabilities (P5.2)



- Return Inventory Targets (P5.2)

- Asset Return Capabilities and Capacities (P5.2)

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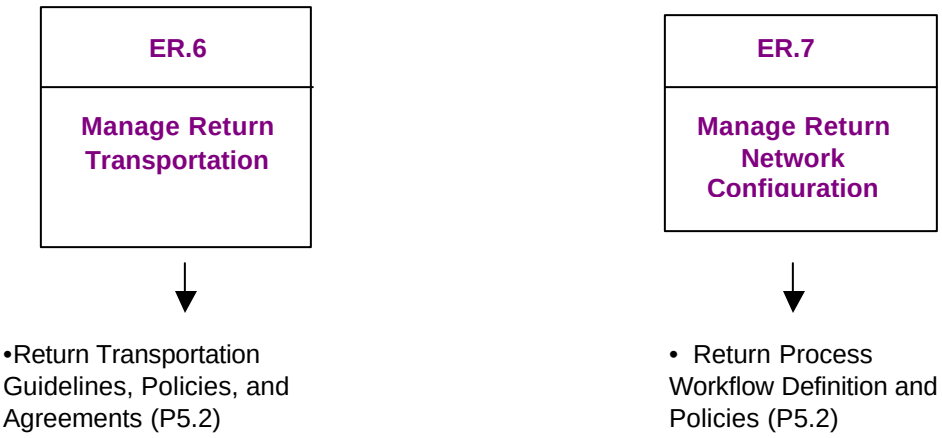
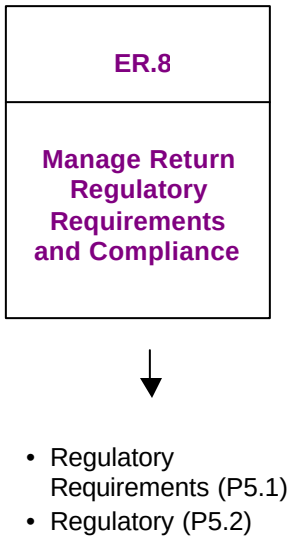
ER: Enable Return





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Enable Process: Manage Business Rules for Return Processes	Process Number: ER.1

Enable Process Definition

The process of establishing, maintaining, and enforcing decision support criteria for Return Planning which translate to 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.

Performance Attributes	Metric
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Business Rules	P5.1, P5.2				
Manage Business Rules					SR2.1
Business Rules for Return Processes					DR2.1

Enable Process: Manage Performance of Return Processes	Process Number: ER.2
Enable Process Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Capabilities of the Return Processes	P5.2				

Enable Process: Manage Return Data Collection	Process Number: ER.3
Enable Process Definition	
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**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Data about Return Capabilities	P5.2				
Receipt Data					DR2.3

Enable Process: Manage Return Inventory	Process Number: ER.4

Enable Process Definition
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
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return
Inventory Control					SR2.3
Return Product Location					SR2.5
Return Inventory Transfer Data					DR2.4

Outputs	Plan	Source	Make	Deliver	Return
Return Inventory Targets	P5.2				
MRO Item Availability					SR2.5
Receipt Data					DR2.3
Return Inventory for Transfer					DR2.4

Enable Process: Manage Return Capital Assets	Process Number: ER.5
Enable Process Definition	
The process of defining capacity utilization and recovery and then acquiring, maintaining and dispositioning an organization's capital assets as part of the overall Returns process.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Asset Return Capabilities and Capacities	P5.2				

Enable Process: Manage Return Transportation	Process Number: ER.6

Enable Process Definition
The process of defining a Return transportation strategy and maintaining the information, which characterizes total asset recovery transportation requirements, and the management of transporters both, inter and intra company.

Performance Attributes	Metric
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Return Transportation Guidelines, Policies, and Agreements	P5.2				
Transportation Guidelines					DR2.3

Enable Process: Manage Return Network Configuration	Process Number: ER.7

Enable Process Definition
The process of defining and maintaining the information about the Returns 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.

Performance Attributes	Metric
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Return Process Workflow Definition and Policies	P5.2				

Enable Process: Manage Return Regulatory Requirements and Compliance	Process Number: ER.8
Enable Process Definition	
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.	
Performance Attributes	**Metric**
Reliability	None Identified
Responsiveness	None Identified
Flexibility	None Identified
Costs	None Identified
Assets	None Identified
Best Practices	**Features**
None Identified	None Identified

Inputs	Plan	Source	Make	Deliver	Return

Outputs	Plan	Source	Make	Deliver	Return
Regulatory Requirements	P5.1				DR2.3
Regulatory	P5.2				
Manage Regulatory Return Policy					SR2.1
Warranty Data					SR2.1

Glossary

PROCESS TERMS

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Access Delivery Performance	Enable Process	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.	ED.2
Align Supply Chain Unit Plan with Financial Plan	Enable Process	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 aggregate forecast and projections related to supply chain, source, make, and delivery plans, as well as business assumptions.	EP.9
Approve Request Authorization	Process Element	The process and actions required determining excess product and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract for conformance to requirements, determining disposition profile and establishing an RPA.	SR3.5
Assess Supplier Performance	Enable Process	The process of measuring actual supplier performance against internal and/or external standards to develop and implement a course of action to achieve targeted supplier performance.	ES.2
Authorize MRO Product Return	Process Element	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.	DR2.1
Authorize Return	Process Element	The process of validating, approving, recording, warranty claims, product recalls and non-conforming product including the processing of product replacement data and/or other similar policies including appropriate replacement.	DR1.1
Authorize Replacement or Credit	Process Element	The process and actions required to authorize deliver of replacement product or credit to customer	SR1.7, SR3.9
Authorize Supplier Payment	Enable Process	The process of authorizing payments and paying suppliers for product or services. This process includes invoice collection, invoice matching and the issuance of checks.	S1.5, S2.5, S3.7
Balance Delivery Resources and Capabilities with Delivery Requirements	Process Element	The process of developing a time-phased course of action that commits delivery resources to meet delivery requirements.	P4.3
Balance Product Resources with Product Requirements	Process Element	The process of developing a time-phased course of action that commits resources to meet requirements.	P2.3

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Balance Production Resources with Production Requirements	Process Element	The process of developing a time-phased course of action that commits creation and operation resources to meet creation and operation requirements.	P3.3
Balance Supply Chain Resources with Supply Chain Requirements	Process Element	The process of developing a time-phased course of action that commits supply-chain resources to meet supply-chain requirements.	P1.3
Bill of Materials (BOM)	Input/Output	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..	EP.7
Business Plan	Input/Output	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.	EP.9
Capacity Constraints	Input/Output	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.	EP.4, EP.5, EP.6
Checkout	Process Element	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.	D4.6
Consolidate Orders	Process Element	The process of analyzing orders to determine the groupings that result in least cost/best service fulfillment and transportation.	D1.4, D2.4
Continuous Improvement Process	Input	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.	EP.2
Customer Replenish Signal	Input/Output	A requirement for product from a distribution location to a source location.	D1.2
Deliver and/or Install	Process Element	The process of preparing and installing the product at the customer site. The product is fully functional upon completion.	D4.7
Deliver Engineer-to-Order Product	Process Category	The process of delivering product that is designed, manufactured, and assembled from a bill of materials, which includes one or more custom parts. Design will begin only after the receipt and validation of a firm customer order.	D3
Deliver Make-to-Order Product	Process Category	The process of delivering product that is manufactured, assembled or configured from standard parts or subassemblies. Manufacture, assembly or configuration will begin only after the receipt and validation of a firm customer order.	D2

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Deliver Retail Products	Process Category	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.	D4
Deliver Return MRO Product	Process Category	The processes of the service provider authorizing and scheduling the MRO return product and the physical receipt of the item by the service provider and their transfer of the item for final disposition determination. The process includes communication between the customer and service provider and the generation of associated documentation.	DR2
Deliver Stocked Product	Process Category	The process of delivering product that is maintained in a finished goods state prior to the receipt of a firm customer order.	D1
Delivered End Items	Input/Output	Products that have been acknowledged as received by the customer.	D1.10
Delivery Plan	Input/Output	A plan for a course of action over specified time periods that involves a projected appropriation of supply resources to meet delivery requirements.	P1.4, P4.4
Disposition Defective Product	Process Element	The process and actions required to bring the defective product back to operational and specifications.	SR1.6
Disposition MRO Product	Process Element	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.	SR2.2
Enable PLAN	Process Category	A plan for the development and establishment of courses of action over specified time periods to appropriate delivery resources to meet projected delivery requirements. The plan contains necessary business requirements for information and relationships to effectively and efficiently PLAN the Supply Chain.	EP
Engineer-to-Order	Process Category	Production of 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.	M3
Establish Delivery Plans	Process Element	The establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet delivery requirements.	P4.4

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Establish Production Plans	Process Element	The process that establishes courses of action over specified time periods to appropriate supply resources to meet projected production and operation plan requirements.	P3.4
Establish Sourcing Plans	Process Element	The establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet sourcing plan requirements.	P2.4
Establish Supply Chain Plans	Process Element	Establishing time-based courses of action that attempt to appropriate and allocate supply resources to meet supply-chain plan requirements.	P1.4
Fill Shopping Cart	Process Element	A set of tasks associated with product selection, storage and movement through to checkout.	D4.5
Finalize Engineering	Process Element	Engineering activities required after acceptance of order, but before product can be manufactured. 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.	M3.1
Fixed Asset	Financial Term	Tangible property used in the operations of a business but not expected to be consumed or converted into cash in the ordinary course of events. Plant, machinery and equipment, furniture and fixtures, leasehold improvements comprise the fixed assets of most companies. They are normally represented on the balance sheet at their net depreciated value.	EP.4, EP.5, EP.6, ED.7
Generate Stocking Schedule	Process Element	The process of scheduling resources to support item-stocking requirements.	D4.1
Identify, Assess, And Aggregate Delivery Resources and Capabilities	Process Element	The process of identifying, evaluating, and considering, as in whole with constituent parts, all things that add value in the delivery of a product or services.	P4.2
Identify, Assess, And Aggregate Product Resources	Process Element	The process of identifying, evaluating, and considering, as in whole with constituent parts, all things that add value in the material and other resources of a product or services.	P2.2
Identify, Assess, And Aggregate Production Resources	Process Element	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.	P3.2
Identify, Assess, And Aggregate Supply Chain Resources	Process Element	The process of identifying, evaluating, and considering, as in whole with constituent parts, all things that add value in the supply chain of a product or services.	P1.2

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Identify MRO Product Condition	Process Element	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.	SR2.1
Identify, Prioritize, and Aggregate Delivery Requirements	Process Element	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.	P4.1
Identify, Prioritize, and Aggregate Product Requirements	Process Element	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.	P2.1
Identify, Prioritize, and Aggregate Production Requirements	Process Element	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.	P3.1
Identify, Prioritize, and Aggregate Supply Chain Requirements	Process Element	The process of identifying, prioritizing, and considering as a whole with constituent parts, all requirements that must be satisfied by the supply chain execution.	P1.1
Integrated Supply Chain (ISC) Plans	Input/Output	Courses of action over specified time periods that represent a projected appropriation of total supply-chain resources to meet total supply-chain demand requirements.	P1.4
Issue Product	Process Element	The physical movement of materials (e.g., raw materials, fabricated components, manufactured 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 manufacturing operation(s).	M1.2 M2.2 M3.3
Item Master	Input/Output	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.	EP.7
Load Vehicle, Generate Ship Documents & Ship	Process Element	The series of task including placing product onto vehicles, generating the documentation necessary to meet internal, customer, and government needs, and sending the product to the customer.	D1.10, D2.10, D3.8

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Maintain Equipment/ Facilities	Enable Process	The ongoing management of the activities associated with ensuring equipment and facilities are kept in proper order. This process element includes required repairs, alterations, calibration, and other miscellaneous items to maintain production capability of the manufacturing fixed asset base.	EM.5
Maintain Source Data	Enable Process	The process of collecting information to support the day-to-day maintenance of all planning and execution data required supporting the sourcing process.	ES.3
Make/Buy Decision	Input/Output	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.	EP.4, EP.5, EP.6
Make-to-Order	Process Category	Production in a Make-to-Order environment adds value to products through fabrication, assembly, mixing, separating, forming, machining and chemical processes. A Make-to-Order environment is one in which products are completed after receipt of a customer order and are built or configured only in response to a customer order.	M2
Make-to-Order - Discrete Manufacturing	Process Category	The process of manufacturing distinct items, such as parts that retain their identity through the transformation process, that is intended to be completed after receipt of a customer order. Make-to-Order includes products built only in response to a customer order and products configured in response to a customer order.	M2
Make-to-Order - Process Manufacturing	Process Category	The process of manufacturing non-discrete products that have value added through mixing, separating, forming, and/or performing chemical reactions. Make-to-Order products are intended to be completed after receipt of a customer order. Then are built or configured only in response to a customer order.	M2
Make-to-Stock	Process Category	Production of distinct items, such as parts that retain their identity through the transformation process, that is intended to be shipped from finished goods or “off the shelf”. Make-to-Stock products are completed prior to receipt of a customer order and are generally produced in accordance with a sales forecast.	M1
Make-to-Stock - Discrete Manufacturing	Process Category	The process of manufacturing distinct items, such as parts that retain their identity through the transformation process, that is intended to be shipped from finished goods or “off the shelf”. Make-to-Stock products are completed prior to receipt of a customer order and are generally manufactured in accordance with a sales forecast.	M1

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Make-to-Stock - Process Manufacturing	Process Category	The process of manufacturing non-discrete products that have value added through mixing, separating, forming, and/or performing chemical reactions. Make-to-Stock products are intended to be shipped from finished goods or "off the shelf," are completed prior to receipt of a customer order, and are generally produced in accordance with a sales forecast.	M1
Manage Business Rules for Plan Processes	Enable Process	The process of establishing, maintaining, and enforcing decision support criteria for Supply Chain Planning, which translate to rules for conducting business. Business rules align PLAN process performance measures with business strategy, goals, and objectives.	EP.1
Manage Business Rules for Return Processes	Enable Process	The process of establishing, maintaining, and enforcing decision support criteria for Return Planning which translate to 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.	ER.1
Manage Capital Assets	Enable Process	Acquisition, maintenance, and disposition of the 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.	ES.5
Manage Channel Standards	Enable Process	The process of 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	EP.10
Manage Deliver Business Rules	Enable Process	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)	ED.1
Manage Deliver Capital Assets	Enable Process	Acquisition, maintenance, and disposition of order management, warehouse and transportation capital assets. Determine material handling (inventory) pick pack & ship methods (inventory), and equipment.	ED.5
Manage Deliver Information	Enable Process	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, deliver data.	ED.3

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Manage Finished Goods Inventories	Enable Process	The process of establishing and maintaining finished goods inventory limits or levels, replenishment models, ownership, product mix, stocking locations	ED.4
Manage Import/ Export Requirements	Enable Process	The process of identifying and complying with import/export regulatory documentation and process standards set by external entities (e.g., government).	ES.8
Manage Import/Export Requirements	Enable Process	The process of recording and maintaining regulations and rates that constrain the ordering and delivering of product. Determine customs requirements, establish letters of credit terms and conditions, etc.	ED.8
Manage Incoming Product	Enable Process	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.	ES.6
Manage In-Process Products (WIP)	Enable Process	Management of the activities associated with handling / storage / movement of materials used to support production.	EM.4
Manage Long-Term Supply Chain Planning	Enable Process	The process of establishing, measuring, and adjusting limits or levels of long-range supply chain capacity to meet long-range demand requirements, typically conducted at the business plan level. Key aspects of supply chain capacity include inventory, capital (fixed assets), outsource (contract manufacturing), and transportation.	EP.4, EP.5, EP.6
Manage Make Equipment and Facilities	Enable Process	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.	EM.5
Manage Performance of Return Processes	Enable Process	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.	ER.2
Manage Performance of Supply Chain	Enable Process	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. 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.	EP.2
Manage Plan Data Collection	Enable Process	The process of integrating and maintaining the accuracy of information necessary to balance supply resources to demand requirements at both the highest aggregate and lowest SKU planning levels.	EP.3

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Manage Planning Configuration	Enable Process	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.	EP.7
Manage Product Inventory	Enable Process	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.	ES.4
Manage Production Data	Enable Process	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.	EM.3
Manage Production Performance	Enable Process	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.	EM.2
Manage MAKE Regulatory Compliance	Enable Process	The process of identifying and complying with regulatory documentation and process standards for Make activities set by external entities (e.g. government)	EM.8
Manage Production Rules	Enable Process	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.	EM.1
Manage Return Capital Assets	Enable Process	The process of defining capacity utilization and recovery and then acquiring, maintaining and dispositioning an organization's capital assets as part of the overall Returns process.	ER.5
Manage Return Data Collection	Enable Process	The process of collecting, integrating and maintaining the accuracy of return execution information necessary to plan the recovery of supply chain resources.	ER.3

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Manage Return Inventory	Enable Process	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.	ER.4
Manage Return Network Configuration	Enable Process	The process of defining and maintaining the information about the Returns 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.	ER.7
Manage Return Regulatory Requirements and Compliance	Enable Process	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.	ER.8
Manage Return Transportation	Enable Process	The process of defining a Return transportation strategy and maintaining the information, which characterizes total asset recovery transportation requirements, and the management of transporters both, inter and intra company.	ER.6
Manage Sourcing Business Rules	Enable Process	The process of defining requirements and establishing, maintaining and enforcing decision support criteria, in line with business strategy, goals and objectives. The criteria translated into rules for conducting business within the enterprise and other legal entities including selection, negotiation, fulfillment, consideration and specific levels of collaboration.	ES.1
Manage Supplier Agreements	Enable Process	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. Also, the management of a supplier certification process, which includes certifying new suppliers and maintaining the current status of existing suppliers.	ES.9
Manage Supplier Network	Enable Process	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.	ES.7
Manage Transportation	Enable Process	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	ED.6

TERM	TYPE	DEFINITION	From Process Category/ Element #:
		support maintenance of internal Outbound Transportation equipment – CAPITAL ASSETS) and 2) the management of transporters.	
Material Availability	Input/Output	Availability of a product by location that is reserved, scheduled or available for sale.	D2.3
Order Backlog	Input/Output	Orders that have been received and entered into the order processing system and are in a queue waiting to be processed and shipped.	D2.3, M2.1
Outsource Plan	Input/Output	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.	EP.4, EP.5, EP.6
Package	Process Element	The series of activities that containerize completed products for storage or sale to end-users. Within certain industries, packaging may include cleaning or sterilization.	M1.4 M2.4 M3.5
Pick (Staged) Product	Process Element	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 performed in the distribution center in response to an order.	D1.9, D2.8, D3.7
Pick Product from Backroom	Process Element	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.	D4.3
Plan & Build Loads	Process Element	Transportation modes are selected and efficient loads are built.	D1.5, D2.5, D3.5
Plan Deliver	Process Category	The development and establishment of courses of action over specified time periods that represent a projected appropriation of supply resources to meet delivery requirements.	P4
Plan Make	Process Category	The development and establishment of courses of action over specified time periods that represent a projected appropriation of production resources to meet production requirements.	P3
Plan Source	Process Category	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.	P2
Plan Supply Chain	Process Category	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.	P1

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Planning Decision Policies	Input/Output	Any company policies that affect how a planning process is defined, approved, and performed.	EP.1
Process Inquiry & Quote	Process Element	Receive and respond to general customer inquiries and requests for quotes.	D1.1, D2.1
Produce and Test	Process Element	The series of activities performed upon material 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.	M1.3 M2.3 M3.4
Product	Term	The end object of a transformation process that includes physical objects, information or services. "Result of activities or processes and may include service, hardware, processed materials, software or a combination thereof; can be tangible (e.g. assemblies of processed materials) or intangible (e.g. knowledge or concepts) or a combination thereof; can be either intended (e.g. offering to customers) or unintended (e.g. pollutant or unwanted effects)."[1]	All
Product Routings	Input/Output	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.	EP.4, EP.5, EP.6, EP.7
Production Capacity	Input/Output	The total system-wide production ability to provide the maximum output of products or services.	P3.2
Production Plans	Input/Output	A master production plan used to allocate capacity among manufacturing resources and schedule finite manufacturing activities or executing the performance of a service.	P1.4, P3.4
Projected Internal and External Capacity	Input/Output	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.	EP.4, EP.5, EP.6
Rated Carrier Data	Input/Output	Contract rates and tariffs from carriers by commodity, lane, mode, etc. for shipments.	D1.6, D2.6

[1] ISO 8402:1994 *Quality Management and Assurance – Vocabulary*, Geneva Switzerland, International Organization for Standardization.

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Receive, Configure, Enter and Validate Order	Process Element	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.	D2.2
Receive Defective Product	Process Element	The process of receiving and recording a defective product against a warranty claim and/or other similar policies including appropriate replacement.	DR1.4
Receive Excess Product	Process Element	The process of recording a physical receipt of Excess product and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract against an RPA	DR3.4
Receive Excess Product Return	Process Element	The process of recovering excess product and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract, as available inventory and disposition excess not usable for sale.	SR3.6
Receive MRO Product	Process Element	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.	DR2.3
Receive Product	Process Element	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.	D1.8
Receive Product at the Store	Process Element	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.	D4.2
Recover and Disposition Excess Product	Process Element	The process of recovering excess and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract product as available inventory and disposition excess not usable for sale.	SR3.8
Release Product to Deliver	Process Element	Activities associated with post-production documentation, testing, or certification required prior to delivery of product to customer. Examples include assembly of batch records fir regulatory agencies, laboratory tests for potency or purity, creating certificate of analysis, and sign-off by the quality organization.	M1.6, M2.6

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Return MRO Product	Process Element	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.	SR2.5
Request MRO Return Authorization	Process Element	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.	SR2.3
Request Return Authorization	Process Element	The process of validating, approving, and recording a Return Product Authorization (RPA) for excess inventory and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract.	DR3.1
Request Return Replacement or Credit	Process Element	The process and actions required determining return replacement or credit.	DR1.2, DR3.2
Reserve Inventory (Resources) & Determine Delivery Date	Process Element	Inventory (both on hand and scheduled) is sourced and reserved for specific orders and delivery is committed to and scheduled.	D1.3, D2.3
Return Defective Product	Process Category	The return and disposition of defective products as defined by the warranty claims, product recall, non-conforming product and/or other similar policies including appropriate replacement.	R1
Return Excess Product	Process Category	The return of excess inventory and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract	R3
Revised Aggregate Forecast and Projections	Input/Output	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.	EP.9
Revised Business Assumptions	Input/Output	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.	EP.9
Revised Capital Plan	Input/Output	A revision to plan for capital expenditures necessitated by either changes in specific business	EP.4, EP.5, EP.6

TERM	TYPE	DEFINITION	From Process Category/ Element #:
		plans or factors and assumptions affecting a business plan.	
ROA	Acronym	(See Return on Assets – Metrics)	
Route Shipments	Process Element	Loads are consolidated and routed by mode, lane, and location.	D1.6, D2.6, D3.6
Routing Guide	Input/Output	Information used to select modes, transportation lanes, available carriers, etc. Listing or routes, carriers & rates.	D1.6, D2.6, D3.6
Schedule MRO Return Receipt	Process Element	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.	DR2.2
Schedule MRO Shipment	Process Element	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.	SR2.4
Schedule Defective Product Return	Process Element	Scheduling and managing the execution of the individual return deliveries of product against an existing warranty claim, product recall and non-conforming product, and/or other similar policies including appropriate replacement.	DR1.3
Schedule Excess Product Return	Process Element	Scheduling and managing the execution of the individual return deliveries of product against an existing RPA.	DR3.3
Schedule Production Activities	Process Element	Given plans for the production of specific parts, products, or formulations in specified quantities and planned availability of required materials, 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 manufacturing activities are coordinated prior to the scheduling of the operations to be performed in producing a finished product.	M1.1 M2.1 M3.2
Scheduled Receipts	Input/Output	Product due to arrive.	D1.8
Select Carriers & Rate Shipments	Process Element	Specific carriers are selected by lowest cost per route and shipments are rated and tendered.	D1.7, D2.7, D3.6
Service Levels	Input/Output	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.	EP.10
Service Requirements	Input/Output	A set of minimum acceptable values that describe service requirements of a particular industry, channel, and/or customer segment.	EP.10

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Shipping Documents	Input/Output	Legal documentation of the contents of a shipment (e.g. way bill, bill of lading, export papers, etc....).	D1.10, D2.9, D3.8
Source Return MRO Product	Process Category	The process, initiated by the customer, of returning maintenance, repair, and overhaul items to a service provider. Process includes: customer identification that an action is required and determining what that action should be, communicating with the service provider, generating return documentation, and physically returning or disposing of the product.	SR2
Sourcing Plans	Input/Output	An aggregate material requirements plan used to schedule material deliveries to meet production plans.	P1.4, P2.4
Stock Shelf	Process Element	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.	D4.4
Stage Product	Process Element	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.	M1.5 M2.5 M3.6
Strategic Plan	Input/Output	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.	EP.9
Supply Chain Asset Management Efficiency	Performance Attribute	The effectiveness of an organization in managing assets to support demand satisfaction. This includes the management of all assets: fixed and working capital.	All
Supply Chain Costs	Performance Attribute	The costs associated with operating the supply chain.	All
Supply Chain Delivery Reliability	Performance Attribute	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.	All
Supply Chain Flexibility	Performance Attribute	The agility of a supply chain in responding to marketplace changes to gain or maintain competitive advantage.	All
Supply Chain Performance Improvement Plan	Input/Output	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.	EP.2

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Supply Chain Performance Metrics	Input/Output	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.	EP.2
Supply Chain Responsiveness	Performance Attribute	The velocity at which a supply chain provides products to the customer.	All
Transfer MRO Product	Process Element	The process where the service provider transfers the MRO product to the appropriate process to implement the disposition decision.	DR2.4
Verify Defective Product	Process Element	The process and actions required determining the cause of defective product conformance to requirements and recording disposition profile.	SR1.5
Verify Excess Product	Process Element	The process of verifying excess product and/or serviceable or obsolete products as defined by the terms and conditions of a customer/supplier contract as available inventory and disposition excess not usable for sale.	SR3.7

METRICS

Level 1 Metrics are primary, high level measures that may cross multiple SCOR processes. Level 1 Metrics do not necessarily relate to a SCOR Level 1 process (PLAN, SOURCE, MAKE, DELIVER, RETURN).

TERM	TYPE	DEFINITION	From Process Category/ Element #:
# Of call backs as % of total inquiries	Metric	Number of callbacks divided by total inquiries.	D1.1, D2.1
% Defective	Metric	The percentage of time a product is considered unacceptable against standard criteria. The # of unacceptable products divided by the total number of units produced during the manufacturing run.	S1, S1.1, S3
% Invoices processed without issues and/or errors	Metric	The number of invoices processed without issues and or errors divided by the total number of invoices processed in the measurement period	S1.5, S2.5, S3.7
% Of Data Accuracy	Metric	Amount of valid MAKE information divided by original source data.	EM.3
% Of Downtime Due to Non-availability of WIP	Metric	The % of time an equipment/operation is idle due to no WIP in queue for that particular equipment/operation.	EM.4
% Of EDI Transactions	Metric	Percentage of orders received via electronic data interchange, EDI.	S1.1, S2.1, S3.3
% Of Faultless Installations	Metric	Number of Faultless Installations divided by_Total Number of Units Installed.	D1.12, D2.11, D3.10
% Of Faultless Invoices	Metric	The number of invoices issued without error. 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	D1.13, D2.12, D3.11
% Of Information Management Assets Used / Production Assets	Metric	Information technology capital assets that support production operations / total capital assets devoted to production operations.	EM.3
% Of Invoice Receipts and Payments Generated via EDI	Metric	# of EDI generated invoices divided by the total number of invoices.	S1.5, S2.5, S3.7
% Of Orders Scheduled to Customer Request	Metric	The percentage of orders whose delivery is scheduled to within an agreed to time frame of the customer's requested delivery date.	M2.1, M3.2, D2.3
% Of Parts Delivered To Point Of Use	Metric	The percentage of material receipts that are delivered directly to production or a consolidation point or to point of use on the production floor with no inspection or minor visual/paperwork inspection only.	M1.2, M2.2, M3.3

TERM	TYPE	DEFINITION	From Process Category/ Element #:
% Of Potential Suppliers Selected which Become Qualified	Metric	The number of suppliers who become "qualified" divided by the total number suppliers who were selected for qualification in the measurement period	S3.1
% Of Qualified Suppliers which Meet Defined Requirements	Metric	The number of qualified suppliers who meet defined requirements divided by the total number of qualified suppliers used as sources in the measurement period	S3.1
% Of Receipts Received without Item and Quantity Verification	Metric	# of receipts with Quantity variance requiring corrective actions (outside industry standard tolerance) divided by total number of receipts.	S1.2, S2.2, S3.4
% Of Receipts Received without Quality Verification	Metric	# of receipts with Quality variance requiring corrective actions divided by total number of receipts.	S1.3, S2.3, S3.5
% Of Single and/or Sole Source Selections	Metric	# of Single and/or Sole Source selections divided by the total number of awards	S3.2
% Of Supplier Contracts Negotiated Meeting Target Terms and Conditions for Quality, Delivery, Flexibility and Cost	Metric	The number of contracts negotiated meeting all business requirements divided by the total number of contracts processed in the measurement period	S3.2
% Of Time Data Available When Needed	Metric	The amount of time that data is accessible by applications during those time periods when it is scheduled to be available. Data availability is often measured as a percentage of an elapsed year.	EM.3
% Orders/Lines Processed Complete	Metric	The number of orders / lines that are processed complete divided by the total orders / lines processed within the measurement period	S1, S2, S3
% Orders/Lines Received Complete	Metric	The number of orders / lines that are received complete divided by the total orders / lines received in the measurement period	S1.2, S2.2, S3.4
% Orders/Lines Received Damage Free	Metric	The number of orders / lines that are processed damage free divided by the total orders / lines processed in the measurement period	S1.2, S2.2, S3.4
% Orders/Lines Received Defect Free	Metric	The number of orders / lines that are received defect free divided by the total orders / lines processed in the measurement period	S1.3, S2.3, S3.5
% Orders/Lines Received On-Time To Demand Requirement	Metric	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	S1.2, S2.2, S3.4
% Orders/Lines Received With Correct Shipping Documents	Metric	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	S1.2, S2.2, S3.4

TERM	TYPE	DEFINITION	From Process Category/ Element #:
% Product Transferred Complete	Metric	The number of orders / lines that are transferred complete divided by the total orders / lines transferred in the measurement period	S1.4, S2.4, S3.6
% Product Transferred Damage Free	Metric	The number of product orders/lines that are transferred damage free divided by the total orders / lines processed in the measurement period	S1.4, S2.4, S3.6
% Product transferred on-time to demand requirement	Metric	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	S1.4, S2.4, S3.6
% Product transferred without transaction errors	Metric	The number of transactions processed without error divided by the total transactions processed in the measurement period	S1.4, S2.4, S3.6
% Return	Metric	% Return to sales at any level of merchandise hierarchy	R1, R3
% Schedules changed within Supplier's Lead Time	Metric	The number of schedules that are changed within the suppliers lead-time divided by the total number of schedules generated within the measurement period	S1.1, S2.1, S3.3
% Schedules generated within Supplier's Lead Time	Metric	The number schedules generated within the suppliers lead-time divided by the total schedules generated in the measurement period	S1.1, S2.1, S3.3
Actual Asset Life Maintenance Cost as % of Replacement Value	Metric	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.	EM.5
Actual-to-Theoretical Cycle Time	Metric	The ratio of the measured time required to produce a given output divided by the sum of the time required to produce a given output based on the rated efficiency of the machinery and labor operations.	P1.2, P3, P3.4
Administrative Costs Associated with In-Transit Handling/Movement of In-Process Product	Metric	The cost of planning and scheduling for labor, training, storage, and transportation for In-Process product. Included are the documentation activities of managing, processing, updating, maintaining and storage of documentation.	EM.6
Asset Turns	Metric	Total gross product revenue ÷ Total net assets	M1, M1.3, M1.4, M2, M2.3, M2.4, M3, M3.4, M3.5
Average days per Engineering Change	Metric	# of days each engineering change impacts the delivery date divided by the total # of changes.	S1.1, S2.1, S3.3
Average days per Schedule Change	Metric	# of days each schedule change impacts the delivery date divided by the total # of changes.	S1.1, S2.1, S3.3
Average Plant-Wide Salary	Metric	Total payroll for salaried employees divided by total headcount	M2, M3
Average Release Cycle of Changes	Metric	Cycle time for implementing change notices divided by total number of changes.	S1.1, S2.1, S3.3

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Build To Ship Cycle Time	Metric	Average time from when a unit/product is deemed shippable by manufacturing until the unit/product actually ships to a customer.	M1.4, M1.5, M2.4, M2.5, M3.5, M3.6
Capacity Utilization	Metric	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.	P1, P1.3, M1, M1.1, M1.3, M1.4, M2, M2.1, M2.3, M3, M3.1, D2.3
Cash-to-Cash Cycle Time	Metric	Cash-to-cash cycle time = inventory days of supply + days sales outstanding – average payment period for materials (time it takes for a dollar to flow back into a company after its 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.	P1, M1.2, M2.2, M3.3, D2.12, D3.11
Commodity Management Profile	Metric	Number of distinct part numbers (purchased commodities) or service components/ resources sourced within the following areas: 200 miles, own country, own continent, and off - shore.	P2, P2.2, P2.4
Complete Manufacture to Order Ready for Shipment Time	Metric	Includes pick/pack and prepare for shipment time, in calendar days.	D2.8, D2.9
Cost of compliance including administrative costs	Metric	Total MAKE cost to comply with regulatory requirements.	EM.8
Cost of Goods Sold	Metric	The cost associated with buying raw materials and producing finished goods. This cost includes direct costs (labor, materials) and indirect costs (overhead).	All
Cost Of In-Process Product (WIP) Damaged from Handling/Storage as a Percentage of Total Material Cost	Metric	The costs of in-process product (WIP) damaged from handling/storage divided by the total cost of those materials.	EM.4, EM.6
Cost of Managing MAKE Information	Metric	The cost of managing, updating, and maintaining the information technology systems that support manufacturing operations.	EM.3
Cost of Noncompliance	Metric	Measure of the MAKE costs for non-conformance with regulatory documentation and process standards set by external entities (e.g. government).	EM.8
Cost per Invoice	Metric	All costs associated with the receipt, review, processing, and payment of a supplier's invoice for product received.	S1.5, S2.5, S3.7
Costs Associated with Managing Production Performance as a % Manufacturing Controllable Cost	Metric	Ratio of Cost for Managing Production Performance to Manufacturing Controllable Cost.	EM.2

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Create Customer Order Costs	Metric	Includes costs for creating and pricing configurations to order and preparing order documents.	D1.2, D2.2, D3.2
Cross training	Metric	The providing of training or experience in several different areas (e.g., training an employee on several machines rather than one). Cross - training provides backup workers in case the primary operator is unavailable.	M3.2
Cumulative Source/Make Cycle Time	Metric	The cumulative external and internal lead-time to build shippable product (if you start with no inventory on-hand, no parts on-order, and no prior forecasts existing with suppliers), in calendar days.	P1, P2, P3, P3.3, P3.4
Customer Invoicing/ Accounting Costs	Metric	Includes costs for invoicing, processing customer payments, and verifying customer satisfaction.	D1.13, D2.12, D3.11
Customer Receipt of Order to Installation Complete	Metric	Includes product installation, acceptance and product up and running time, in calendar days.	D2.10, D2.11, D3.9, D3.10
Customer Signature/Authorization to Order Receipt Time	Metric	Time, in calendar days, from when the customer authorizes an order to the time that the order is received.	D1.2, D2.2, D3.2
Damage and Shrinkage	Metric	Reductions of actual quantities of items in stock, in process, or in transit. The loss may be caused by scrap, theft, deterioration, evaporation, etc.	R1, D4
Days Sales Outstanding	Metric	5 point annual average of gross accounts receivable ÷ (total gross annual sales ÷ 365)	D1.13, D2.12, D3.11
DELIVER Cycle Time	Metric	All time associated with unloading, receiving, inspecting, and placing incoming materials into inventory and processing payment to the supplier including recording exceptions, moving incoming materials to storage location, and inputting data into inventory systems.	D1, D2, D3
Delivery Performance to Customer Commit Date	Metric	The percentage of orders that are fulfilled on or before the original scheduled or committed date.	M1, M2, M3, M3.1, D1.3, D1.10, D2, D2.9, D3, D3.8
Delivery Performance to Customer Request Date	Metric	The percentage of orders that is delivered on the customer's requested date.	P1, P1.3, P4, P4.3, P4.4, M1, M2, M3, D1.10, D1.3, D2, D2.3, D2.9, D3, D1.3, D3.8
Demand/ Supply Planning Costs	Metric	Costs associated with forecasting, developing finished goods or end item inventory plans, and coordinating Demand/Supply process across entire supply chain, including all channels. (Not including MIS associated costs.)	P1
Distribution Costs	Metric	Includes costs for warehouse space and management, finished goods receiving and stocking, processing shipments, picking and consolidating, selecting carrier, and staging products/systems.	D1.8, D1.9, D2.4, D2.5, D2.6, D2.7, D2.8, D3.5, D3.6, D3.7

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Dock to Stock Cycle Time	Metric	Definition to be determined for next release	D1.8
Documentation	Metric	Number of orders without correct documentation supporting the order, including packing slips, bills of lading, invoices, etc.	D2.8
Downside Delivery Flexibility	Metric	Percentage delivery reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.	D1, D1.8, D1.11, D1.13, D2, D2.10, D2.12, D3, D3.9, D3.11
Downside Installation Flexibility	Metric	Percentage installation reduction sustainable at 30 days prior to installing with no inventory or cost penalties.	D1.12, D2.11, D3.10
Downside Order Flexibility	Metric	Percentage order reduction sustainable at 30 days prior to shipping with no inventory or cost penalties.	D1.2, D2.2, D3.2, D3.3, D3.4
Downside Production Flexibility	Metric	The percentage order reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.	M1.1, M2.1, M3.2
Downside Shipment Flexibility	Metric	Percentage shipment reduction sustainable at 30 days prior to shipping with no inventory or cost penalties.	D1.5, D1.9, D1.10, D2.5, D2.8, D2.9, D3.5, D3.7, D3.8
Downtime in MAKE Due To Compliance Issues	Metric	The measure of process downtime due to noncompliance to external and internal regulatory documentation or process standards (e.g. specifications, SPC, governmental regulations, etc.)	EM.8
ECO (Engineering Change Order) Cycle Time	Metric	The total time required from request for change from customer, engineering, production or quality control to revise a blueprint or design released by engineering, and implement the change within the Make operation.	M3
ECO cost	Metric	Costs incurred from revisions to a blueprint or design released by engineering to modify or correct a part. The request for the change can be from a customer or from production quality control or another department.	M3, M3.1
End-of-Life Inventory	Metric	Inventory on hand which will satisfy future demand for products that are no longer in production at your entity.	D1.8
Equipment Utilization	Metric	Number of filled equipment SKU locations divided by the total SKU locations provided by the equipment expressed as a percentage	EM.4
Equipment/Facility Maintenance Cost as % of Manufacturing Controllable Cost	Metric	Cost to repair, alter, calibrate and maintain production equipment divided by total Manufacturing Controllable Cost.	EM.5
Field Finished Goods Inventory Days of Supply	Metric	The inventory which is kept at locations outside the four walls of the manufacturing plant, i.e. distribution center, warehouse.	D2.9, D2.11, D3.10

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Fill Rates	Metric	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	P1, P1.3, P4, P4.4, M1.3, D1, D1.3, D1.9, D2
Finished Goods Inventory Carrying Costs	Metric	Sum of all costs associated with finished goods inventory: opportunity cost, shrinkage, insurance and taxes, total obsolescence, channel obsolescence and field sample obsolescence.	D1.3
Finished Goods Inventory Days of Supply	Metric	Finished goods inventory days of supply are calculated as gross finished goods inventory ÷ (value of transfers/365 days).	P4, P4.4, D1, D1.3, D1.8, D2, D3, D3.8
Finished Goods Inventory Days of Supply	Metric	Plant finished goods inventory days of supply are calculated as gross plant finished goods inventory ÷ (value of transfers/365 days).	M1.5, D2.8, D3.7
Forecast Accuracy	Metric	Forecast accuracy is calculated for products and/or families for markets/distribution channels, in unit measurement. Forecast Accuracy = Forecast Sum - Sum of Variance Forecast Sum Where: Forecast Sum = The sum of the units forecasted to be shipped in each month based upon the forecast generated at the critical time fence. Sum of Variances = The sum of the absolute values, at the forecasted line item level, of the differences between each month's forecast as defined above and actual demand for the same month.	EP.4, EP.5, EP.6, EP.7, P1, P1.1, P2.1, P3.1, P4, P4.1, P4.2
Forecast Cycle	Metric	The time between forecast regenerations that reflect true changes in marketplace demand for deliverable end products. Only true "bottoms-up" forecasts are counted: for example, if weekly or monthly updates to the forecast only re-calendar or shift dates for the forecast to avoid changing the annual dollar-based forecast, they should not be considered true forecast regenerations.	P1.1, P2.1
Frequency of Replenishment	Metric	Also “replenishment interval” is the time between successive replenishment orders.	P2
Incoming Material Quality	Metric	# Of received parts which fail inspection divided by the total # of parts received	D1.8
Indirect to Direct Labor Headcount Ratio	Metric	Ratio of total number of employees required to support production in general without being related to a specific product, indirect labor, to the total number of employees that is specifically applied to the product being manufactured or used in the performance of the service, direct labor.	M1, M2, M3
In-Process Failure Rates	Metric	The percentage of time work-in-process is not completed. 1 minus the percentage of completed work-in-process units.	M3.4
Installation Costs	Metric	Includes costs for verifying site preparation, installing, certifying, and authorizing billing.	D2.11, D3.10

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Intra-Manufacturing Re-Plan Cycle	Metric	Time between the acceptance of a regenerated forecast is by the end-product producing location and the reflection of the revised plan in the master production schedule of all the affected plants, excluding external vendors.	M1.3, M2.3, M3.4
Inventory Accuracy	Metric	The absolute value of the sum of the variance between physical inventory and perpetual inventory	M1.2, M2.2, M3.3, D4
Inventory Aging	Metric	The percentage of total gross inventory (based on value) covered by expected demand within specific time buckets.	M1, M2, M3
Inventory Cycle Counting Accuracy	Metric	The absolute value of the sum of the variance between physical inventory and perpetual inventory. Or the number of accurate part cycle counts divided by the total number of cycle counts performed expressed as a percentage.	EM.4
Inventory Days Of Supply	Metric	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. Five point annual average of the sum of all gross inventories (raw materials & WIP, plant FG, field FG, field samples, other) ÷ (COGS ÷ 365).	P1, P1.3, S1, S1.4, S2, S2.4, S3, S3.6, M1.1, M2.1, M3.2
Inventory Obsolescence as a % of Total Inventory	Metric	The annual obsolete and scrap reserves taken for inventory obsolescence expressed as a percentage of annual average gross inventory value.	M1, M1.2, M2.1, M2.2, M3.3, D1.8, D2
Item/Product/Grade Changeover Time	Metric	The time required for a specific machine, resource, work center, process, or line to convert from the production of the last good piece of item/product/grade of A to the first good piece of item/product/grade of B.	M1, M1.3, M2, M2.3
Machine Wait Time	Metric	The percentage of time a machine facility is idle; 1 minus the utilization rate.	M1.1, M2.1
MAKE Cycle Time	Metric	The sum of the following average times: Order release to start actual build + Total build cycle + End build to leaves plant (i.e., moves to on/off-site distribution or goes to customer). For continuous and mixed processes, manufacturing cycle time is calculated as the average number of units (doses, kilos, pounds, gallons, etc.) in process divided by the average daily output in units.	M1.2
Management Decision Timeframe Ratio	Metric	The ratio of the time needed to make a decision about a particular process divided by the cycle time of that process. (This generates a number that is better if it is lower). For example, if an operation can be performed in 2 hours, and it takes 4 hours to make a decision about that operation, the ratio would be 200%. The Timeframe would be affected by the time it takes to collect data, process information, develop knowledge and evaluate the situation, and implement the decision.	EM.3

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Manufacturing Controllable Cost	Metric	All costs under direct control of the MAKE function. These costs are: direct labor and expenses, indirect labor and expenses, asset charges, and excess material & packaging costs. (Raw and packaging materials used to make a finished good are not included.)	EM.2, EM.3, EM.5
Material Requisition Cycle Time	Metric	The total amount of time required converting the identification of capacity needs for key material resources to the receipt of those resources.	M1.2, M2.2, M3.3
Mean Time Between Failure	Metric	The average time interval between failures for repairable equipment and facilities for a defined unit of measure (e.g. operational hours, cycles, miles).	EM.5
Mean Time to Repair Asset	Metric	The average time to repair equipment and facilities for a defined unit of measure (e.g. operational hours, cycles, miles).	EM.5
Number of ECOs	Metric	Total number of revisions to a blueprint or design released by engineering to modify or correct a part, engineering change orders (ECO). The request for the change can be from a customer or from production quality control or another department.	M3, M3.1
Number of Supply Sources	Metric	Total number of internal and external direct production material suppliers used.	P2, P2.2, P2.4
On Time in Full	Metric	Number of orders for which not all of the items on order are delivered in the quantities requested.	D2.8
Order Consolidation Profile	Metric	Consolidation: is defined as the activities associated with filling a customer order by bringing together in one physical place all of the line items ordered by the customer. Some of these may come directly from the production line and others may be picked from stock. The following profiles have been captured: Shipped direct to customer's dock from point of manufacture (No Consolidation). Shipped direct to the customer with consolidation completed, local to customer by your transport company. Moved to on-site staging location for consolidation and shipment direct to customer. Moved to on-site stockroom for later pick, pack and ship. Shipped to different locations for consolidation or later pick, pack and ship.	D1.4
Order Entry and Maintenance Costs	Metric	Includes costs for maintaining the customer database, credit check, accepting new orders and adding them to the order system as well as later order modifications.	D1.2, D2.2
Order Entry Complete to Order Ready for Shipment Time	Metric	Including release to manufacturing, order configuration verification, production scheduling, build, pick/pack, and prepare for shipment time, in calendar days.	D1.4, D1.5, D1.6, D1.7, D1.9, D1.10, D3.5, D3.6, D3.7

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TERM	TYPE	DEFINITION	From Process Category/ Element #:
Order Entry Complete to Start Manufacture Time	Metric	Time from completion of order entry to that of the release to manufacturing, in calendar days.	D2.4, D2.5, D2.6, D2.7, D3.4
Order Fulfillment Costs	Metric	Includes costs for processing the order, allocating inventory, ordering from the internal or external supplier, scheduling the shipment, reporting order status and initiating shipment.	D1.3, D2.3, D3.3, D3.4
Order Fulfillment Cycle Time	Metric	The average actual lead times consistently achieved, from Customer Signature/ Authorization to Order Receipt, Order Receipt to Order Entry Complete, Order Entry Complete to Start-Build, Start Build to Order Ready for Shipment, Order Ready for Shipment to Customer Receipt of Order, and Customer Receipt of Order to Installation Complete.	M3, M3.1, D1, D2, D3
Order Management Costs	Metric	The aggregation of the following cost elements (contained in this glossary): Create Customer Order Costs Order Entry and Maintenance Costs Contract/Program and Channel Management Costs Installation Planning Costs Order Fulfillment Costs Distribution Costs Transportation Costs Installation Costs Customer Invoicing/Accounting Costs	D1, D1.1, D2, D2.1, D3, D3.1
Order Management Cycle Time	Metric	The total amount of time required converting a customer order into a receipt by the customer.	P4, P4.1, P4.2
Order Ready for Shipment to Customer Receipt of Order Time	Metric	Including total transit time (all components to consolidation point), consolidation, queue time, and additional transit time to customer receipt of order, in calendar days.	D1.11, D2.9, D3.8
Order Receipt to Order Entry Complete Time	Metric	Time required, in calendar days, for order revalidation, configuration check, credit check, and scheduling of received orders.	D1.2, D1.3, D2.2, D2.3, D3.3
Overhead Cost	Metric	Costs incurred in the operation of a business that cannot be directly related to the individual products or services produced. These costs, such as light, heat, supervision, and maintenance, are grouped in several pools and distributed to units of product or service by some standard allocation method such as direct labor hours, direct labor dollars, or direct materials dollars.	M1, M2, M3
Package Cycle Time	Metric	The total time required to perform a series of activities that containerize completed products for storage or sale to end-users. (Within certain industries, packaging may include cleaning or sterilization.)	M1.4, M2.4, M3.5
Packaging Cost	Metric	The cost to package product as a finished good, not including intermediate handling of materials, based on given number of Delivered Finished Goods.	M1.4, M2.4, M3.5

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Perfect Order Fulfillment	Metric	A "perfect order" is defined as an order that meets all of the following standards: Delivered complete; all items on order are delivered in the quantities requested Delivered on time to customer's request date, using your customer's definition of on-time delivery Documentation supporting the order including packing slips, bills of lading, invoices, etc., is complete and accurate Perfect condition: Faultlessly installed (as applicable), correct configuration, customer-ready, no damage	D1.10, D1.11, D2, D2.2, D2.9, D2.10, D3, D3.8, D3.9
Placement Information (RFID)	Metric	Placement information as measured by RFID	P2, P4
Plant Cost Per Hour	Metric	Total planning expenditures divided by the total number of hours spent exercising the plan	M1, M2
Plant-Level Order Management Costs	Metric	The aggregation of the following cost elements for which manufacturing is central focal point of orders (contained in this glossary): Create Customer Order Costs Order Entry and Maintenance Costs Contract/Program and Channel Management Costs Installation Planning Costs Order Fulfillment Costs Distribution Costs Transportation Costs Installation Costs Customer Invoicing/Accounting Costs	M2.1, M3.2
Product Acquisition Costs	Metric	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.	S1, S2, S3, D1.8
Product Losses (Sourced/in-process/finished)	Metric	The total cost of lost material from receipt and inspection of raw materials to the shipping of the finished good, per given number of Inventory Turns or Delivered Finished Goods.	M1, M2, M3
Product Management and Planning Costs as a % of Product Acquisition Costs	Metric	Product (Commodity) Management and Planning – All costs associated with supplier sourcing, contract negotiation and qualification and the preparation, placement, and tracking of a Purchase Order expressed as a percentage of product acquisition costs. This category includes all costs related to buyer/planners.	S1.1, S2.1, S3.2, S3.3
Product Process Engineering as a % of Product Acquisition Costs	Metric	Product Process Engineering – Cost associated with tasks required to document and communicate product specification, as well as reviews to improve the manufacturability of the purchased item expressed as a percentage of product acquisition costs.	S3.1

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Product Structure	Definition	Recipes / formulas / BOMs / that define the composition of a product	EM.1
Product Structure Cycle Time	Metric	Total time from demand to release of product structure	EM.1
Production Material Administrative Cost	Metric	Administrative costs associated with the handling / storage / movement of materials	EM.4
Production Material Cycle Time	Metric	Time required moving material to point of use.	EM.4
Production Material Handling Cost	Metric	Cost of handling/movement of materials used to support production.	EM.4
Production Material Handling Damage	Metric	Cost of material damaged from handling / storage / movement as a percentage of total material cost.	EM.4
Production Material Storage Cost	Metric	Cost of storage space used for the production materials.	EM.4
Production Plan Adherence	Metric	Production Plan Adherence is calculated at the shippable end-product level in units, using the following formula: Production Plan - Sum of Variance Production Plan Where: Production Plan = The sum of the units planned to be completed (i.e., placed into inventory or shipped) in each month based upon the plan generated in the previous month. Sum of Variances = The sum of the absolute values, at the end item level, of the differences between each month's production plan as defined above and actual production for the same month.	P3, P3.4
Production Rules Preparation Cycle Time (PRPCT)	Metric	Total Time from demand rules for production rules until releases of production details.	EM.1
Published Delivery Cycle Time	Metric	The typical standard lead-time (after receipt of order) currently published to customers by the sales organization. For typical orders only, not standing/re-supply orders.	D1, D2
Published Delivery Lead Times	Metric	The typical standard lead-time (after receipt of order) currently published to customers by the sales organization. For typical orders only, not standing/re-supply orders.	D1, D2
Purchased Product by Geography	Metric	Number of the following distinct part numbers of: Raw materials, Externally manufactured intermediates, Toll manufactured finished products, Packaging product, Labeling product that are sourced within the following areas: 200 miles, Own country, Own continent, Off-shore.	S3.1
Quarantine Time	Metric	Setting aside of items from availability for use or sale until all required quality tests have been performed and conformance certified.	M1.6, M2.6

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Ratio Of Actual To Theoretical Cycle Time	Metric	The ratio of the measured time required for completion of a set of tasks divided by the sum of the time required to complete each task based on the rated efficiency of the machinery and labor operations.	M1.3, M1.4, M2.3, M3.4
Ratio of the Cost of Managing MAKE Information/ Manufacturing Controllable Costs	Metric	The ratio of these two metrics provides an understanding into the effect of IT on the Make operating cost.	EM.3
Raw Material & WIP Inventory Days of Supply	Metric	Raw material & WIP inventory days of supply are calculated as gross raw material and WIP inventory ÷ (value of transfers/365 days).	P2, P3, D2, D3
Raw Material or Product Days-of-Supply	Metric	Raw material or product inventory days of supply are calculated as gross raw material or product inventory ÷ (value of transfers/365 days).	M1.2
Raw Material Shrinkage	Metric	The costs associated with breakage, pilferage, and deterioration of raw material inventories.	P2
Receiving Accuracy	Metric	A measure of receipt conformity of recorded values to the actual values.	S1
Receiving & product storage costs as a % of Product Acquisition Costs	Metric	Receiving and Product Storage – All costs associated with taking possession of and storing product. Includes warehouse space and management, product receiving and stocking, processing work orders, pricing, and internal product movement. This does not include incoming inspection.	S1.3, S2.3, S3.5
Receiving and Put Away Cycle Time	Metric	The total amount of time required moving materials from an inbound location to an internal storage location.	M3.3
Receiving costs as a % of Product Acquisition Costs	Metric	All costs associated with taking possession of product expressed as a percentage of product acquisition costs. This does not include inspection.	S1.2, S2.2, S3.4
Receiving Cycle Time	Metric	Total elapsed time from time product is received to time it is passed to next process	S1.2, S2.2, S3.4
Regulatory Documentation Cycle Time	Metric	The time required to complete regulatory documentation during a production run. The product cycle less this metric is the basic production cycle time. Does not include required product data collection for quality or process improvement.	EM.8
Re-plan Cycle Time	Metric	The time between the initial creation of the regenerated forecast and its reflection in the Master Production Schedule of the end-product production facilities.	M1, M2
Responsiveness Lead Time	Metric	Minimizing elapsed time, including all delays, to receive a customer order and transform resources into goods and services, through to the point of customer receipt.	M1.1, M2.1, M3.2
Return on Assets	Metric	A financial measure of the relative income-producing value of an asset. It is calculated as net income divided by total assets.	P1

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Sales Per Employee	Metric	Total product revenue divided by total number of full-time equivalent employees	P1
Schedule Achievement	Metric	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.	M1.1, M2.1, M3.2
Schedule Interval	Metric	This is the measure of the time required to regenerate the schedule to manufacture specific parts, products, or formulations in specified quantities within a specific time frame. The schedule interval must be less than the manufacturing cycle time to be (not complete)	M1.1, M2.1
Scheduled Resource Cost	Metric	The measure of the cost of people, information systems, management direction, and any other costs associated with provided schedules for manufacturing.	M1.1, M2.1
Scrap expense	Metric	Expenses incurred from material falling outside of specifications and possessing characteristics that make rework impractical.	M1.3, M2.3, M3.4
Shrinkage	Metric	The costs associated with breakage, pilferage, and deterioration of inventories.	P4
SKU	Metric	Stock keeping unit	EM.4
SKU Turnover	Metric	The number of times a SKU cycles or turns over in year; divide the average inventory level into the annual cost of sales – APICS.	P2, P4
Source Cycle Time	Metric	Cumulative lead-time (total average combined inside-plant planning, supplier lead time [internal or external], receiving, handling, etc. from demand identification at the factory until the products are available in the production facility) required sourcing 95% (chosen to eliminate outlying data) of the dollar value of products from internal and external suppliers.	S1.2, S2.2, S3.4
Source Flexibility	Metric	The time required to achieve a sustained increase in volume by 20%.	P2, P2.3
Source Identification Cycle Time	Metric	Total elapsed time from the time the requirement is identified until the source(s) are identified.	S3.1
Source Qualification Cycle Time	Metric	Total elapsed time from time the source is identified until it is qualified and approved.	S3.1
Source Selection Cycle Time	Metric	Total elapsed time from the time the RFQ is created until the contract is awarded and accepted by the supplier.	S3.2
Sourced/In-Process Product Requisition Cycle Time	Metric	The time required to provide manufacturing with a needed component, service, or additive from the time of requisition to the time of delivery.	M1.2, M2.2, M3.3
Sourcing Costs as a % of Product Acquisitions Costs	Metric	All costs associated with the identification of potential suppliers, evaluation of RFQ's and supplier qualifications and the generation of a contract expressed as a percentage of product acquisition costs.	S3.2

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Staging Time	Metric	The percentage of the time that the actual stage cycle time (interval of time required for individual products to move into a temporary holding location to the time of actual shipment or movement into finished goods) complies with customer requirements.	M1.5, M2.5
Stock Outs or In Stocks	Metric	A lack of materials, components, or finished goods that are needed.	P4, D1, D4
Storage Space Utilization	Metric	Volume of all materials stored divided by the total volume of the storage facility expressed as a percentage.	EM.4
Supplier Cycle Time	Metric	The time required for a supplier to complete a single cycle, beginning with the receipt of an order and ending with the fulfillment of that order.	P2, P2.4
Supplier Fill Rate	Metric	The percentage of time a supplier completes a commitment to a customer to ship or deliver an order within 24 hours.	P2, P2.4
Supplier On-Time Delivery Performance	Metric	The percentage of orders that are fulfilled on or before the original customer requested date (suppliers performance measured by the customer).	P2, P2.3, P2.4
Supply Chain Finance Costs	Metric	Costs associated with paying invoices, auditing physical counts, performing inventory accounting, and collecting accounts receivable. (Does not include customer invoicing/accounting costs.)	P1.3
Time and Cost related to Expediting the Sourcing Processes of Procurement, Delivery, Receiving and Transfer.	Metric	Total time and/or cost variance to standard related to expediting a product through the Total Source Cycle.	S1, S2, S3
Time and/or Cost Reduction related to Expediting the Transfer Process.	Metric	Expediting cycle time for Transfer Process compared to the Standard Cycle time for the Transfer Process. Delta is the additive cost required by the disconnect.	S1.4, S2.4, S3.6
Time and/or Cost reduction related to Source Identification	Metric	Desired State Source Identification Cycle metric compared to the As-Is State Source Identification Cycle metric. The delta being the cost /cycle improvement.	S3.1
Time Interval Between a Performance Standard Request and Availability.	Metric	The time interval from the receipt of a performance standard request and the availability of the standard.	EM.2
Time to Comply with Regulatory Changes	Metric	Time interval between regulatory change issuance and implementation of the change.	EM.8
Total Build Time	Metric	Total build time is the average time for build-to-stock or configure-to-order products from when production begins on the released work order until the build is completed and unit deemed shippable.	M1.3, M2.3, M3.4
Total Deliver Costs	Metric	Costs associated with the Deliver Processes including execution, administration, and planning.	P4

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Total Internal and/or External Costs That Are The Result Of Inaccurate Production Rule Details	Metric	Direct and indirect costs that can be attributed to inaccurate production details. Includes rework, scrap, recalls, preparation, etc.	EM.1
Total Source Cycle Time to Completion	Metric	Total elapsed time from time of requirement identification to time product is in the appropriate stocking location within the supply chain and the supplier payment is authorized.	S1, S2, S3
Total Source Lead Time	Metric	Total source lead time is the cumulative lead time required to source 95% of the dollar value of materials from internal and external suppliers.	S1, S1.1, S2, S2.1, S3, S3.1, S3.2, S3.3
Total Supply Chain Costs	Metric	Costs associated with the supply chain including execution, administration, and planning.	EP.1, EP.2, EP.3, EP.4, EP.5, EP.6, EP.7, EP.8, EP.9, E.10, P4
Total WIP Inventory DOS	Metric	Total WIP inventory days of supply are calculated as gross WIP inventory ÷ (value of transfers/365 days).	P3, P3.3, P3.4
Training/ Education	Metric	The total number of programs aimed at new work methods for experienced workers and short courses in current practices for new employees to increase productivity.	M1.3, M2.3
Transfer and Product Storage Costs as a % of Product Acquisition Costs	Metric	All costs associated with the storage and/or movement of the product to the next appropriate stocking location (transfer point) in the supply chain expressed as a percentage of product acquisition costs.	S1.4, S2.4, S3.6
Transfer Cycle Time	Metric	Total elapsed time from the time the product is presented for transfer until product is moved to the next process.	S1.4, S2.4, S3.6
Transportation Costs	Metric	Includes all company paid freight and duties from point of manufacture to end-customer or channel.	D1.4, D1.5, D1.6, D1.7, D2.9, D3.8
Unit Cost	Metric	Total labor, material, and overhead cost for one unit production, e.g., one part, one gallon, one pound.	M2, M3
Unplanned Maintenance Downtime % of total Production Time	Metric	Percent of time facilities or equipment are unavailable when scheduled compared to the Total Build Time (Production Time).	EM.5
Upside Delivery Flexibility	Metric	Number of days required to achieve an unplanned sustainable 20% increase in deliveries.	D1, D1.8, D1.11, D1.13, D2, D2.10, D2.12, D3, D3.9, D3.11
Upside Installation Flexibility	Metric	Number of days required to achieve an unplanned sustainable 20% increase in installations	D1.12, D2.11, D3.10
Upside Order Flexibility	Metric	Number of days required to achieve an unplanned sustainable 20% increase in orders.	D1.2, D2.2, D3.2, D3.3, D3.4

TERM	TYPE	DEFINITION	From Process Category/ Element #:
Upside Production Flexibility	Metric	The number of days required to achieve an unplanned sustainable 20% increase in production.	M1.1, M2.1, M3.2
Upside Shipment Flexibility	Metric	Number of days required to achieve an unplanned sustainable 20% increase in shipments.	D1.5, D1.9, D1.10, D2.5, D2.8, D2.9, D3.5, D3.7, D3.8
Validation Frequency	Metric	The amount of time between reviews of a process. For example, Production Process Validation Frequency would refer to the amount of time between the reviews of the Production Process. This generally would be performed periodically to ensure that the process is generating the desired results with the desired inputs.	EM.3
Value of assets provided by service provider (cost avoidance)	Metric	Value of process and/or procedure provided by a service provider that directly results in cost savings in reviewing and selecting a source.	S3, S3.1
Value-Added Employee Productivity	Metric	Value added per employee is calculated as total product revenue less total material purchases ÷ total employment (in full-time equivalents).	M1, M1.3, M2, M2.3, M3, M3.4
Verification Costs as a % of Product Acquisition Costs	Metric	All costs associated with verifying the product meets all quality and contract specifications expressed as a percentage of product acquisition costs.	S1.3, S2.3, S3.5
Verification Cycle Time	Metric	Total elapsed time from time product starts the validation process until it moves to the next process.	S1.3, S2.3, S3.5
Warranty and Returns	Metric	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.	M1.3, M1.4
Warranty Costs	Metric	Warranty costs include materials, labor and problem diagnosis for product defects.	M1, M1.3, M1.4, M2, M2.3, M2.4, M3, M3.4, M3.5
Yield	Metric	The ratio of usable output from a process to its input.	M1, M1.3, M2, M2.3, M2.4, M3.4
Yield Variability	Metric	The condition that occurs when the output of a process is not consistently repeatable either in quantity, quality, or combination of these.	M1.3, M2.3, M3.4

APPENDIX

The Following Metrics were renamed or considered to be Level Four or unnecessary for SCOR Version 5.0 by the Technical Committees, so are no longer included in the Model Glossary for Version 6.0 either. New Name/reason for exclusion are included for the information of the user.

TERM	DEFINITION	From Process Category/ Element#:	New Name/Reason for Exclusion in 5.0/6.0
# of Orders Not Delivered Complete	Number of orders for which not all of the items on order are delivered in the quantities requested.	D2.8	Replaced by "On Time In Full" and "Documentation" to measure Reliability
# of Orders with Complete and Accurate Documentation	Number of orders without correct documentation supporting the order, including packing slips, bills of lading, invoices, etc.	D2.8	Replaced by "On Time In Full" and "Documentation" to measure Reliability
Build Cycle Time	Build cycle time is the average cycle time for build-to-stock products calculated as the average number of units in process divided by the average daily output in units.	P	Considered out of scope for PLAN
Faultless Invoices	The number of invoices issued without error. 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	D1.13, D2.12, D3.11	Now only listed as "% of Faultless Invoices"
Finished Goods Shrinkage	The costs associated with breakage, pilferage, and deterioration of finished goods inventories	P4	Considered to be Level 4
Inventory Carrying Costs	Inventory Carrying Costs are the sum of opportunity cost, shrinkage, insurance and taxes, total obsolescence for raw material, WIP, and finished goods inventory, channel obsolescence and field sample obsolescence.	P1	Considered out of scope for PLAN
Make Flexibility	This time it typically takes to implement a sustainable unplanned increase in end product supply of 20% if each of the factors shown below was the only constraint; Internal manufacturing capacity; Direct labor availability; Constraining processes; Key components/materials availability; Direct labor availability	P3, P3.3	Difficult to measure and calculate
Manufacturing Preparation Cycle Time (MPCT)	Total time from demand to release of manufacturing details	EM.1	Difficult to measure and calculate
Material Overhead Cost Per Dollar of Material Expenditure	Total Material carrying costs which include all capital cost, storage cost, and risk costs divided by the total cost of acquiring the material.	P3	Not relevant for SCOR

TERM	DEFINITION	From Process Category/ Element#:	New Name/Reason for Exclusion in 5.0/6.0
Number of End Products/SKU's	Total number of unique end item product offerings. End items are individually planned and managed.	P3, P3.2	Not relevant for SCOR
Percent Defective	The percentage of time a product is considered unacceptable against standard criteria. The # of unacceptable products divided by the total number of units produced during the manufacturing run.	S1, S1.1, S3	Replaced by "% Orders/lines Processed Complete," "% Schedules Generated within Supplier's Lead Time," and "% Schedules Changed within Supplier's Lead Time"
Percent of Orders Scheduled to Customer Request	The percentage of orders whose delivery is scheduled to within an agreed to time frame of the customer's requested delivery date.	M2.1, M3.2, D2.3	Replaced by "% of Orders Scheduled to Customer Request"
Percent of parts Delivered to Point of Use	The percentage of material receipts that are delivered directly to production or a consolidation point or to point of use on the production floor with no inspection or minor visual/paperwork inspection only.	M1.2, M2.2, M3.3	Replaced by "% of Parts Delivered to Point of Use, "% of Parts Received at Point of Use"
Plan Stability	The number of changes within the critical time frame defined as the boundary between flexible capacity and fixed capacity.	EP.4, EP.5, EP.6, P1.4	Considered Level 4 metric
Plant Finished Goods Inventory Days of Supply	Plant finished goods inventory days of supply are calculated as gross plant finished goods inventory divided (value of transfers/365 days).	M1.5, D2.8, D3.7	Replaced by "Finished Goods Inventory Days of Supply"
Product & Process Data Accuracy (Bills of Material, Routings, Planning Factors, etc.)	The number of planning items with complete and accurate Product & Process Data divided by the total number of planning items.	EP.3, EP.7, P1, P1.2	Considered to be Level 4
Production Flexibility	Upside Flexibility: The number of days required to achieve an unplanned sustainable 20% increase in production. Downside Flexibility: The % order reduction sustainable at 30 days prior to delivery with no inventory or cost penalties.	M1.1, M2.1, M3.2	Separated into Upside Production Flexibility and Downside Production Flexibility
Quality Levels	Not Defined	M1.3, M2.3	Considered out of scope
Raw Material Inventory Carrying Costs	Sum of all costs associated with raw material inventory: opportunity costs, shrinkage, insurance and taxes, and total obsolescence.	P2	Considered Level 4 metric
Routing Data Accuracy	The numbers of planning items with complete and accurate routing information divided by the total number of planning items.	EP.3	Considered Level 4 metric
Total Manufacturing Employment	Not Defined	M1.3, M2.3, M3.4	Replaced by "Total Production Employment"
Touch Labor Job Classifications	Not Defined	M1.1, M2.1, M3.2	Considered out of scope

TERM	DEFINITION	From Process Category/ Element#:	New Name/Reason for Exclusion in 5.0/6.0
WIP Shrinkage	The costs associated with breakage, pilferage, and deterioration of WIP inventories. The loss of any material, part, and/or assembly that are being worked on or are waiting to be processed within the operations system.	P3	Considered Level 4 metric
Work-In-Process Inventory Carrying Costs	Sum of all costs associated with WIP inventory: opportunity cost, shrinkage, insurance and taxes, and total obsolescence.	P3, P3.4	Considered Level 4 metric