

Welcome to Metrics

This lesson addresses the use of metrics to measure and evaluate product performance. Metrics help the Life Cycle Logistician (LCL) determine whether a product is, or is capable of, achieving the desired supportability objectives. When a metric identifies unacceptable performance, the LCL can effectively focus corrective action on the specific problem causing the deviation and avoid wasting resources, time, and materials on misdirected efforts.



Objectives

Upon completion of this lesson, you will be able to:

- Identify the guidelines that LCLs should follow when including metrics in the product support plan.
- Identify the types of metrics used in tracking product support quality.
- Recognize the challenges in developing and using metrics.
- Identify the basic components of benchmarking in order to establish goals for metrics.

Metrics to Achieve Objectives

LCLs should include metrics in the product support plan that are useful in achieving the plan's objectives. When selecting metrics, LCLs should follow these guidelines (select each for details):



On November 22, 2005, the USD (AT&L) signed a [memorandum](#) that defined the five metrics for evaluating overall Life Cycle Management (LCM): operational availability, mission reliability, cost per unit of usage, logistics footprint, and logistics response time.

Popup Text

Selection

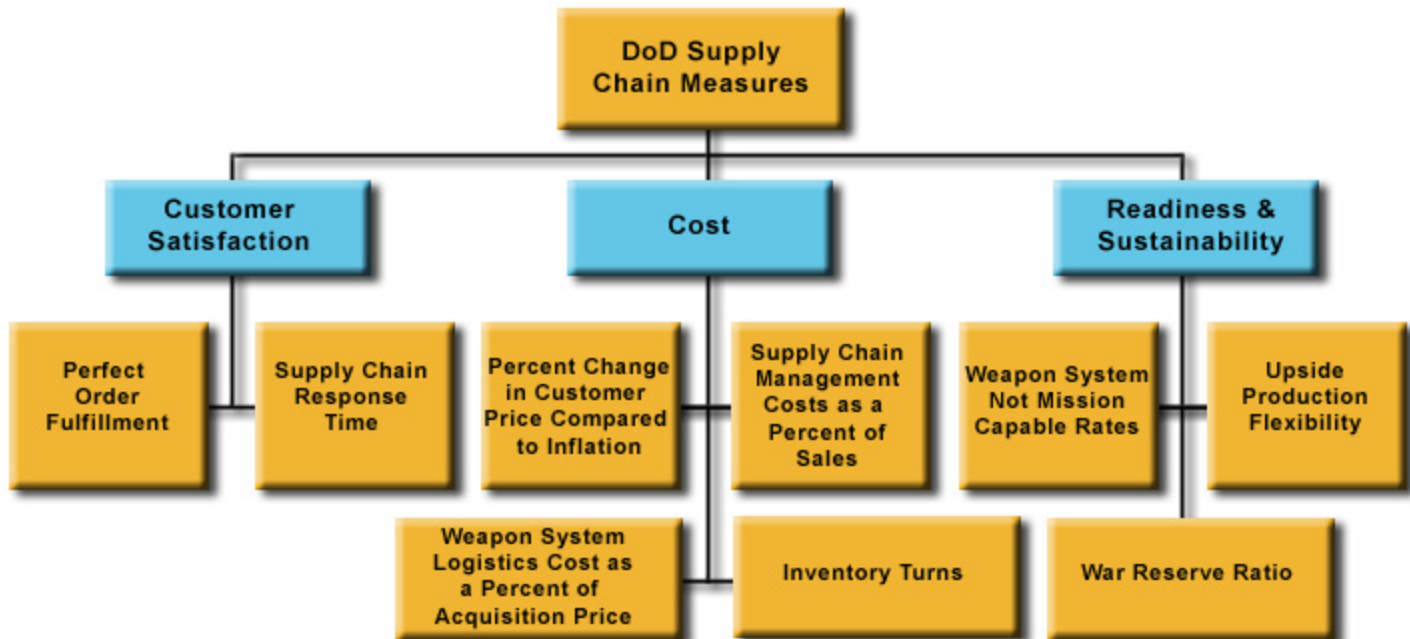
- Use customer-focused measures to assess how well customer needs are being met.
- Link performance measures and goals to overall business and mission objectives; select metrics that promote mutual execution of responsibilities and discourage organizational conflict.
- Choose metrics that assist managers in managing current operations and facilitating future planning.
- Select a set of metrics that evaluate program performance, cost, and management and provide a basis for changing the program.
- Ensure metrics are useful in justifying resources as part of support planning, programming, and budgeting.
- Choose a metric for which the data can be easily obtained.

Set Up

- Establish cost measures that monitor use of organizational resources.
- Establish baselines to provide a context of historical performance for evaluating organizational activity and improvement initiatives.
- Establish comparison benchmarks to provide clear performance targets and feedback, and facilitate progressive improvement.
- Establish measures to prevent the cost of information collection and analysis from exceeding the benefits derived.
- Avoid measures that may result in unintended consequences.

Balanced Metrics

The product support plan should describe a "balanced" set of metrics for use at the enterprise level of the supply chain. Specific metrics should be grouped in a logical fashion that demonstrates the LCL's product support strategy and objectives. An example of such a construct is:



Long Description

This graphic depicts DoD Supply Chain Measures in an organization chart format. The top box is DoD Supply Chain Measures. The next level includes Customer Satisfaction, Cost, and Readiness and Sustainability. Customer Satisfaction includes Perfect order fulfillment and Supply chain response time. Cost includes Percent change in customer price compared to inflation, Supply chain management costs as a percent of sales, Weapon system logistics costs as a percent of acquisition price, and inventory turns. Readiness and Sustainability includes Weapon system not mission capable rates, Upside production flexibility, and War reserve ratio.

Consistent and Clearly-Defined Metrics

The LCL should be able to demonstrate that selected metrics are consistently and clearly defined within the product support plan and that these are consistent with applicable government standards. Simply stated, a performance measure is a value or characteristic to measure an output or an outcome. The Office of Management and Budget (OMB), [Preparation and Submission of Budget Estimates](#), defines the terms of performance measurement below. Select each term to read the definition.

GENERAL
OBJECTIVE

OUTCOME GOAL

OUTPUT GOAL

PERFORMANCE
GOAL

PERFORMANCE
INDICATOR

PERFORMANCE
MEASURE

Popup Text

General Objective

Objectives are paired in a strategic plan with a general goal and are used to help assess if a general goal was or is being achieved; an objective usually describes a level of achievement more specific than a general goal.

Outcome Goal

A description of the intended result, effect, or consequence that will occur from carrying out a program or activity.

Output Goal

A description of the level of activity or effort that will be produced or provided during a period or by a date, including a description of the characteristics and attributes (e.g., timeliness) established as standards for conducting the activity or effort.

Performance Goal

A target level of performance expressed as a tangible, measurable objective to compare to actual achievement, including a goal expressed as a quantitative standard, value, or rate; this goal is included in the annual performance plan and can be an outcome or output goal.

Performance Indicator

A value or characteristic that measures output or outcome; performance indicators are associated with performance goals in the annual performance plan.

Performance Measure

A performance goal or indicator.

Data for Metrics

The LCL should ensure that the product support plan clearly demonstrates the capability to access and collect metrics data in a fashion that permits managers and users across the supply chain to assess selected metrics in meaningful ways.

Ideally, the information systems that produce and display these metrics will have a capability to aggregate metrics information in useful categories as needed. Examples of such aggregation groupings are:

- Supply source (e.g., inventory control point [ICP], retail supply activity).
- Customer (e.g., military service, geographical area, force structure).
- Weapon system.
- Type of item (e.g., stocked, prime vendor, planned direct vendor delivery [DVD], nonstocked).
- Commodity.
- Issue priority (for perfect order fulfillment).
- Mission essentiality code (for perfect order fulfillment).



Balanced Metrics Criteria

The LCL should adopt a comprehensive set of metrics criteria for selection of a balanced suite of specific metrics to assess the product support plan.

The [Supply Chain Operations Reference \(SCOR\)](#)(R) Model includes a series of metrics attributes that may provide the basis for selecting product support metrics. A series of characteristics adapted from the SCOR approach include:

- **Delivery reliability:** The performance of the supply chain in delivering the product correctly.
- **Responsiveness:** The velocity at which a supply chain provides products to the customer.
- **Flexibility:** The ability of a supply chain to respond to marketplace changes to satisfy customer needs.
- **Asset management efficiency:** The effectiveness of an organization in managing assets to support demand satisfaction.
- **Weapon system readiness:** Readiness resulting from effective supply chain operations. (NOTE: Though not part of the commercial version of the SCOR model, weapon system readiness is the ultimate goal of the Department of Defense's application of SCOR model processes and procedures.)



Metrics Details

The LCL should be able to select metrics that are useful in demonstrating the capabilities included in the product support plan. For each metric, at least, the following details should be specified:

- Description of the population that the metric includes,
- Identification of the source of data,
- Precise definition of key terms,
- Statement of the mathematical expressions that will be used to derive various values,
- Specification of frequency of measurements to derive the metric,
- Description of the graphics that will be used to display the data, and
- Specification of user's tolerance levels (i.e., "specification limits").

A good metric will be meaningful, logical, simple to express, understandable, repeatedly and quickly derivable, unambiguously defined, and available from economically collectible data. In addition, a good metric will indicate trends, suggest corrective actions, and numerically describe the progress toward the output or outcome.

Knowledge Review

In an effort to clearly define metrics, a description of the level of activity or effort that will be produced or provided during a period or by a date, including a description of the characteristics and attributes (e.g., timeliness) established as standards for conducting the activity or effort is which type of goal?

- ☐ Outcome goal
- ☐ Performance goal
- ☒ Output goal

Check Answer



Output goal is a description of the level of activity or effort that will be produced or provided during a period or by a date, including a description of the characteristics and attributes (e.g., timeliness) established as standards for conducting the activity or effort.

Problems in Developing and Using Metrics

Metrics information required by LCLs usually consists of the following three categories: workload, current resource expenditure and outputs, and performance compared to standards and goals.

A primary problem in metrics is standardizing, synchronizing, retrieving, analyzing, formatting, and presenting the data in a reasonable time. The current environment presents the additional problems below:

- [Measurement problems](#)
- [Information problems](#)

Popup Text

Measurement Problems

- Most organizations have several measures, but they do not always permit a meaningful evaluation of the business activities.
- Measures often provide unique organizational data rather than integrated logistics information related to the goal of readiness.
- Measures are neither sufficiently standard nor integrated to manage a DoD component's logistics business effectively.
- Logistics process measures often do not assess progress in meeting customer requirements.

Information Problems

- Information is often incomplete. Data definitions and times are inconsistent in terms of coverage and submission. In addition, multiple sources often provide duplicative information.
- Information access is not timely. Often data are aggregated at such a high level that insights are masked. Providers of source data frequently do not have direct knowledge of higher organizational requirements and, therefore, do not appreciate the importance of accurate, timely submissions.
- Limited use of source data automation and manual manipulation result in management reports that are produced quarterly or annually, are up to a year old when published, and often do not accurately reflect actual performance.
- Too many review layers process data before decision-makers use the data.

Mitigating Common Performance Measurement Problems

LCLs should demonstrate in the product support plan that the management approach for selected supportability metrics will successfully mitigate common performance measurement problems.

Logistics managers need to adopt performance metrics that ensure the building and operation of a comprehensive automated data collection and analysis capability. Managers should adopt the Balanced Scorecard approach to performance measurement.

The product support plan should demonstrate that this [Balanced Scorecard](#) approach incorporates measures in the following four areas:

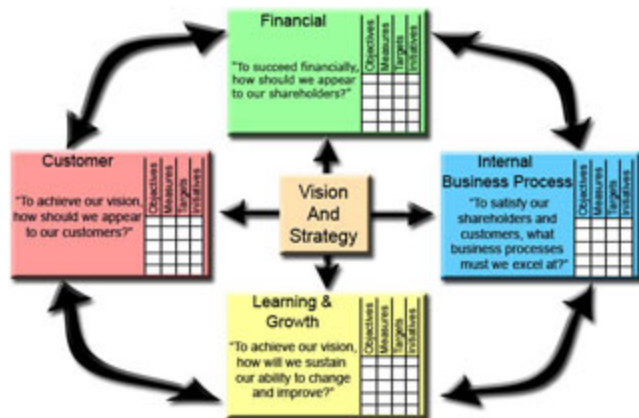
1. Meeting the strategic needs of the enterprise.
2. Meeting the needs of individual customers.
3. Addressing internal business performance.
4. Addressing process improvement initiative results.



Balanced Scorecard Approach

A Balanced Scorecard approach translates organizational strategy into measurable objectives using the following key concepts:

- No single measure provides clear performance targets or places adequate attention on critical mission areas.
- Product support goals, objectives, and related measures should give a comprehensive view of all levels of activities involved in the product support plan.
- Using a limited number of key measures minimizes information overload.
- A scorecard approach guards against optimizing one goal at the expense of others.



Select Image for Enlargement

Long Description

This is a graphic that illustrates the scorecard approach. There are 4 “scorecards” with different titles arranged around a square that has the words “Vision and Strategy” inside. There are four arrows coming out of this square. Each one points to one of the four scorecards. The scorecards are: Financial (To succeed financially, how should we appear to our shareholders?), Internal Business (To satisfy our shareholders and customers, what business processes must we excel at?), Learning and Growth (To achieve our vision, how will we sustain our ability to change and improve?), Customer (To achieve our vision, how should we appear to our customers?). Each scorecard has the four columns labeled: Objectives, Measures, Targets, and Initiatives.

Selecting and Testing Metrics

The LCL should use metrics to demonstrate the effectiveness of the product support plan by selecting and testing a series of potential metrics designed to ensure comprehensive achievement of the plan's support objectives. An effective approach to metrics selection is demonstrated in the following table which relates potential product support metrics to desirable metrics characteristics.

RELIABILITY

RESPONSIVENESS

FLEXIBILITY

PRODUCT SUPPORT
COSTS

ASSET MANAGEMENT
EFFICIENCY

WEAPON SYSTEM
READINESS

Popup Text

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. Potential product support metrics include Perfect Order Fulfillment.

Responsiveness

The speed at which a supply chain provides products to the customer. Potential product support metrics include Order Fulfillment Cycle Time.

Flexibility

The agility of a supply chain in responding to changes to marketplace environment or customer needs to gain or maintain competitive advantage. Potential product support metrics include Upside Flexibility, Upside Adaptability, and/or Downside Adaptability.

Product Support Costs

The costs associated operating the supply chain. Potential product support metrics include Supply Chain Management Cost of Goods Sold.

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. Potential product support metrics include Cash-to-Cash Cycle Time and Return on Supply Chain Fixed Assets.

Weapon System Readiness

The resultant weapon system readiness resulting from effective supply chain operations. Potential product support metrics include Not Mission Capable Supply or Maintenance rates or Materiel/Operational Availability.

Clearly and Concisely Defining Metrics

The LCL should ensure that selected product support metrics are clearly and concisely defined. Below are definitions of some commonly used product support metrics. Select each term to read its definition.

PERFECT ORDER
FULFILLMENT

SUPPLIER FILL
RATE

PRODUCT
SUPPORT COSTS

UPSIDE
DELIVERY
FLEXIBILITY

ORDER
FULFILLMENT
CYCLE TIME

ASSET
TURNOVER

Popup Text

Perfect Order Fulfillment

A "perfect order" is defined as an order that meets all of the following standards:

1. Delivered complete; all items on order are delivered in the quantities requested
2. Delivered on time to customer's request date, using the customer's definition of on-time delivery
3. Documentation supporting the order including packing slips, bills of lading, invoices, etc., is complete and accurate
4. Perfect condition: faultlessly installed (as applicable), correct configuration, customer-ready, no damage

Supplier Fill Rate

The percentage of time a supplier completes a commitment to a customer to ship or deliver an order within 24 hours

Product Support Costs

Costs associated with product support including execution, administration, and planning.

Upside Delivery Flexibility

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

Order Fulfillment Cycle Time

The average actual cycle time consistently achieved to fulfill customer orders.

Asset Turnover

Total gross product revenue ÷ total net assets

Establishing Goals for Metrics

After selection of product support metrics, the LCL should establish an actual and target baseline of quantifiable goals for each approved metric. One generally accepted method to establish these baselines is benchmarking.

The basic components of [benchmarking](#) are:

- Identifying a critical process that needs improvement.
- Identifying an organization that excels in the process, preferably the best.
- Contacting the organization that you are benchmarking; visiting them, and studying the process or activity.
- Analyzing the data, documenting conclusions, and identifying actions.
- Implementing changes to critical processes in your own organization.
- Measuring results and looping back to repeat the process.

Popup Text

Benchmarking

The concept of discovering what is the best performance being achieved, whether in your organization, by another activity, or by an entirely different organization in another area or in industry.

An improvement tool whereby an organization measures its performance or process against other organization's best practices, determines how those activities achieved their performance levels, and uses the information to improve its own performance.

A continuous process whereby an enterprise measures and compares all its functions, systems and practices against similar activities or competitors, identifying quality or performance gaps in the organization, and strives to match or exceed this performance.

Knowledge Review

The average actual cycle time consistently achieved to fulfill customer orders is known as which of the following?

☒ Order Fulfillment Cycle Time

☐ Upside Delivery Flexibility

☐ Supplier Fill Rate

Check Answer



Order Fulfillment Cycle Time is the average actual cycle time consistently achieved to fulfill customer orders.

Metrics Summary

You have completed Metrics and should now be able to:

- Identify the guidelines that LCLs should follow when including metrics in the product support plan.
- Identify the types of metrics used in tracking product support quality.
- Recognize the challenges in developing and using metrics.
- Identify the basic components of benchmarking in order to establish goals for metrics.

Lesson Completion

You have completed the content for this lesson.

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