Supply Chain Operations Reference (SCOR) Model

Mitch Millstein, CFPIM, C.P.M., CQM, CQE
Supply Velocity, Inc.
mitch@supplyvelocity.com
(314) 406-4962

March 2020

In the 1990's a consulting firm and market research firm, along with some academics got together to create a process and performance measurement model to support the growing field of supply chain management. They created a non-profit, the Supply Chain Council, to share this model, the supply chain operations reference model, or SCOR.

You may be wondering, "What is an operations reference?" SCOR is a process model, and separately, but related, a measurement model.

Process Model

As a process model it follows the supply chain through five functional areas. These are called the Level 1 processes.

- Plan
- Source
- Make
- Store*
- Deliver
- Return

I added "Store", which is not in the original model, given the importance of warehouse and inventory management to the economy in general and ecommerce in particular.

Plan

Processes that balance aggregate demand and supply to develop a course of action that best meets sourcing, production and delivery requirements

Level 2 Planning processes:

- Balance resources with requirements
- Determine customer requirements
- Define Resources
- people, money, equipment, facilities, systems, etcetera
- Manage regulatory risk

Source

Processes that procure goods or services to meet planned or actual demand

Level 2 Sourcing processes:

- Supplier selection
- Purchase – receive – verify – authorize payment
- Assess supplier performance
- Manage the supply network (suppliers' suppliers)

- Manage supplier risk
- Single source, country-risk, currency hedging
- Manage import / export requirements

Make

Processes that transform products to a finished good to meet planned or actual demand

Level 2 Production processes:

- Engineering / design
- Production
- Waste disposal
- Testing
- Packaging

Store

Processes that manage inventory for use in manufacturing or to support downstream demand

Level 2 Delivery processes:

- Manage warehouse
- Receive
- Pick/pack/ship
- Set inventory levels

Deliver

Processes that provide finished goods and services to customers

Level 2 Delivery processes:

- Route shipments
- Select carriers
- Installation
- Invoice customer

Return

Processes associated with returning, or receiving returned products, for any reason; typically including post-delivery customer support

Level 2 Return processes:

- Defective product to suppliers
- Defective product from customers
- Products sent to suppliers for maintenance, repair or overhaul

- Products sent from customer for maintenance, repair or overhaul

The purpose of this process model is to ensure you have the correct processes in place so you can profitably serve your customers. Additional Level 3 and Level 4 details can be identified by using process flow mapping.

Measurement Model

The measurement model is hierarchical. It first wants to be sure that you consider the Voice of the Customer and the Voice of the Business. Measures should ensure you take care of the customer and take care of the business. Only when an organization does both, can it thrive.

Within the Voice of the Customer and Voice of the Business are five key aspects of Supply Chain Excellence. Supply chains should be:

- Reliable
- Responsive
- Adaptable
- Low Cost
- Efficient Asset Managers

Finally, there are nine specific, high level, measures that SCOR recommends you use to determine if you are achieving Supply Chain Excellence.

- Perfect order fulfillment
- Order fulfillment cycle time
- Upside supply chain flexibility
- Upside supply chain adaptability
- Downside supply chain adaptability
- Total supply chain management costs
- Cash-to-cash cycle time
- Return on supply chain fixed assets
- Return on working capital

Perfect order fulfillment
POF = (Total number of perfect orders) / (Total number of orders)
Perfect =

- Correct item
- Quantities match the order
- Delivery meets committed date
- Documentation is accurate and complete
- Product is not damaged and performs per specifications

Order fulfillment cycle time
OFCT = (Actual Cycle Time for all orders) / (Total number of orders)

Includes (if applicable) =

- Source cycle time
- Make cycle time
- Delivery cycle time

Upside supply chain flexibility
The number of days required to achieve an unplanned, sustainable 20% increase in quantities delivered.

Upside supply chain adaptability
The maximum percentage increase in quantity delivered that can be achieved within 30 days.

Downside supply chain adaptability
The reduction in quantities ordered at 30 days prior to deliver that can be achieved with no inventory or cost penalties.

Total supply chain management costs
TSCMC = Sales – Profit – Sales, General & Administrative Costs

Cash-to-cash cycle time
The time for an investment made in raw materials to flow back into the organization.

C2CCT = Inventory days of supply + Days sales outstanding – Days payable outstanding

Inventory days of supply = (Average value of inventory) / (Annual cost of goods sold) / 365
Days sales outstanding = (Average accounts receivable) / (Total annual sales) / 365
Days payable outstanding = (Average accounts payable) / (Total annual material purchases) / 365

Return on supply chain fixed assets
The return an organization receives on its invested capital in fixed assets.

RSCFA = (Supply chain revenue – Cost of goods sold – Supply chain management costs) / Fixed Assets

Note: Supply chain revenue is used instead of revenue as there may be other sources of revenue besides the supply chain.

Return on working capital
RWC assesses the magnitude of investment relative to the organization's working capital position versus revenue generated from the supply chain.

RWC = (Supply chain revenue – Cost of goods sold – Supply chain management costs) / (Inventory + Accounts receivable – Accounts payable)

Using SCOR
Like another important performance measurement model, The Balanced Scorecard, measures are only useful if you do something to make them better. We recommend a monthly review of your SCOR measures, creating action items to improve where there are performance gaps.