

Achieving Operational and Financial Self- Sustainability: an Approach for Public Health Supply Chains in Frontier Markets

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What is ‘Self-Sustaining?’

For many years, the development community has focused on ‘sustainability’ across many areas of public health. We find that ‘sustainability’ can have several definitions and meanings for different stakeholders, which makes it a challenge to converse clearly about with governments. This paper aims to define the categories and focus areas of a ‘self-sustaining supply chain,’ in the sense of a supply chain that can sustain itself without external involvement.

The discussion of what it means to be self-sustaining is covered somewhat in the Frontier Markets Supply Chain Maturity Model (‘Maturity Model’) by the Bill & Melinda Gates Foundation. This is used for direction and to anchor the discussion that follows in this paper (see Appendix 1).

Self-Sustaining Performance

Those working in development will have witnessed a moment in which funding for a project or initiative ends, and the performance of the supply chain drops thereafter. This indicates a non-sustainable approach to supply chain performance. Donor-funded projects often bring talent and new perspectives from the international community, which infuse new ideas and strong technical assistance. As that talent moves on, however, performance often drops.

In seeking examples of supply chains whose performance is self-sustaining, the commercial sector is often looked to, as there are few examples within the development community. This is especially true when a supply chain experiences change, due to external forces or new products or services – all scenarios that are very common.

One factor governing self-sustaining performance is the staff and talent behind the supply chain. This leads to the second category within self-sustainability: the knowledge base.

Self-Sustaining Knowledge Base

A major reason why performance drops after donor funding ends is that the talent sponsored by the funding moves to a different project. Developing the knowledge base and skills of the supply chain (or ‘capacity’) ensures that the supply chain can continue to function even as team members leave. However, past efforts to ‘build capacity’ have not yielded self-sustaining supply chains.

Investments are often made in the knowledge and skills of the implementing partner to ensure their usefulness to the government. These partners provide assistance to the government, but often also upskill the government team to the same technical level. Additionally, government staff turnover continues to present a real challenge.

Strong supply chains build processes that are not dependent on people; rather, they can function regardless of who is managing them. Processes that are ‘in control’ are built and owned by supply chain teams who manage for risk and ensure continuity. Tribal knowledge must be transitioned to living documents, so that a wider team within the supply chain can manage a given process.

Examples of a self-sustaining knowledge base in a public health supply chain are more often seen in circumstances where donors are not a major funder. For example, the supply chain in Sudan (NMSF) has invested heavily in skills and knowledge-development in their supply chain team. NMSF is a self-financing non-profitable public organisation. They built and launched a training centre in April 2017. Its purpose was explained by the NMSF Director General, Dr Gamal Ali: ‘We had noticed that the health policymakers in

our country did not consider the health supply chain as an important factor in public health systems. Although our staff are highly trained professionals, they lacked understanding of health supply chain management, so training and continuous professional development became a priority for NMSF.’

Self-Sustaining Financial Management

Financial sustainability is another facet of ‘sustainability’ in the development community.

A supply chain is almost always a cost centre for the organisation. Supply chains do not add to revenue; instead, their operation represents a cost for the organisation.

Public health supply chains are no different in this regard. Fundamentally, they are cost centres. They can also add tremendous value to the overall public health system. In wealthy countries, these supply chains are funded through the tax base and often supplemented through private business models. In poorer countries, the tax base is often not yet robust enough to take on this cost, resulting in the need for international donor funding.

As a path to financial self-sustainability, some public health supply chains are pursuing a reseller model, somewhat similar to a ‘revolving drug fund,’ in order to capture revenue. This shifts the model away from a supply chain model and towards a reseller model, an important consideration.

A successful example of this reseller model is the United Nations Children’s Fund (UNICEF) Supply Division and their ability to offer procurement services across the health and humanitarian communities. Through them, in recent years, procurement services have been provided to partners in more than 100 countries, with the sum reaching over USD 1.65 billion in procurement value annually. Their business model, and that of Kenya Medical Supplies Agency (KEMSA) in Kenya, can be benchmarked by public health supply chains aiming to shift to a reseller model.

Self-Sustaining Areas of Focus

Taking these three categories of self-sustainability (performance, knowledge base, and financial) into account, guidance is needed to understand where to focus. For example, which kinds of performance should be managed, and what types of skills and what exact costs are needed? As a supply chain aims to be self-sustaining in performance, knowledge base, and financials, they must consider all focus areas outlined in this section.

Supply Chain Operations Reference (SCOR) Model

A widely accepted supply chain model is the SCOR model, which can be used to guide discussions very similar to this one (see Appendix 2). PSA is delighted to leverage the new partnership between BMGF and American Production and Inventory Control Society (APICS), the governing body of SCOR. This announcement was made in Chicago at the annual APICS Conference on 30 September 2018, along with the announcement that APICS is expanding to become the Association for Supply Chain Management.

Developed in 1996 across multiple industries and sectors, SCOR is now in its 12th version. It is a reference model for supply chains around the world as they benchmark and discuss learnings and challenges with each other. It covers four areas: process, practices, people, and performance.

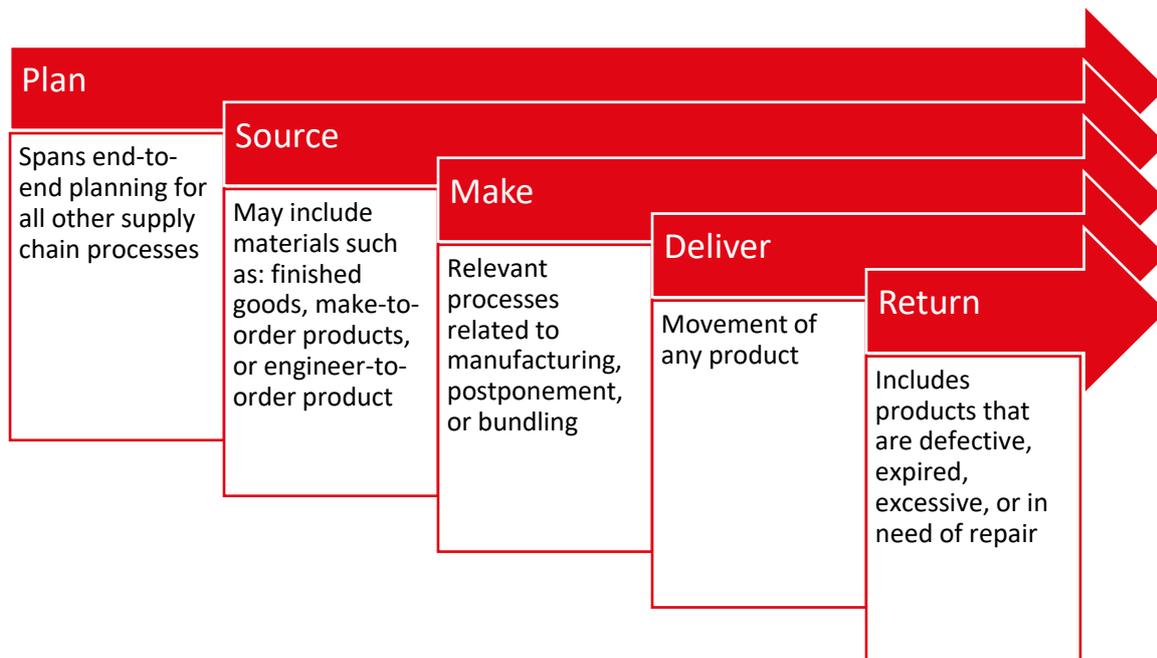
Supply Chain Processes

Considering all supply chain processes is essential, as the ‘chain’ of a supply chain cannot function properly without all processes working smoothly. Past efforts and technical assistance in the development community have focused almost solely on operating the supply chain – how to run a warehouse, whether a delivery should

be insourced or outsourced, etc. However, there has been a lack of focus on supply chain management – specifically, of the enablement of the supply chain. There are two areas of supply chain processes: operations and management.

Supply Chain Operations

The most commonly referenced component of the SCOR model is the supply chain operations process below. These are also the traditional focus of technical assistance from donors and partners in the development community.



Supply Chain Management

The SCOR model calls the management process of the supply chain the ‘enable’ phase, as these management functions enable a supply chain to operate. Several areas are involved in managing a supply chain:

1. Business Rules
2. Performance
3. Data and Information
4. Human Resources
5. Assets
6. Contracts
7. Networks
8. Regulatory Compliance
9. Risk
10. Procurement
11. Technology

This ‘enable’ phase is home to relevant topics for public health supply chains, for example contract management, asset management, and several categories related to information technology (IT) discussions and management. Note, however, that ‘data’ or what we might call ‘ICT’ is spread across several management areas. This is important, as proper data management, data-driven decisions, and selection of the right supportive IT tool are very different activities, with different kinds of outcome.

Discussions of successful supportive supply chain technology for public health have been unclear in the past. Moving forward, we will leverage these industry standards to clarify the vision, goals, and performance of these separate categories.

Supply Chain Practices

Supply chain practices are the concepts understood across supply chains. SCOR outlines emerging practices, best practices, standard practices, and declining practices. The practices of the development community,

however, are far less mature than those of the commercial sector. For example, the practice of using Stock Keeping Unit (SKU) identifiers is considered to be standard or even declining practice within commercial supply chains, yet using SKU identifiers is still very much an emerging practice in public health. This is not to say that these SCOR practices do not translate; rather, we need to look at historical commercial trends to benchmark relevant concepts and build public health going forward.

Relevant public health supply chain practices are found in the Maturity Model. In the model, realistic practices are outlined across supply chain function and across supply chain maturity level. These will be continuously referenced.

Supply Chain People

The SCOR model extensively outlines the skills that supply chain teams should have based on the roles and expectations of staff. This is an area in which it is necessary to evaluate current skills and knowledge base and compare them to what is needed for proper role execution. It is also recommended that a single-point-of-failure analysis is completed, to capture the impact of losing key personnel.

The Maturity Model offers basic guidance which we will build on for a more robust self-sustaining plan.

Supply Chain Performance

The Maturity Model gives direction on likely areas of focus for a given supply chain.

SCOR offers the common practice of looking at supply chain performance across five high-level categories, with different departments investigating to a lower level of detail. Importantly, a supply chain must stack-rank these, as their priorities will occasionally conflict. It is not possible to have excellent performance across all elements, at all times:

- **reliability** meaning perfect order;
- **responsiveness** meaning time to complete different processes;
- **agility** meaning supply chain flexibility in a changing environment;
- **cost** measured in several ways; and
- **efficiency** meaning how well a supply chain can manage its assets.

To be successful, supply chains need a clear focus on goal statements and clear measurement of progress against those goals. However, criticism of public health supply chains' performance has appeared widely across all these areas. These criticisms include late orders and inaccurate paper work or bin cards (reliability); public procurement taking too long (responsiveness); unknown costs of operation (cost); poorly utilised donated trucks; and expired/obsolete inventory (efficiency).

This can be confusing for supply chains aiming for a tight focus and real progress. Therefore, we recommend that supply chains focus on just three top-level Key Performance Indicators (KPIs), with each department cascading from those. While it is certainly a challenge for teams to select just three KPIs, the process of definition and the management of these KPIs will dramatically increase the probability of successfully achieving the chosen goals.

As the category of supply chain performance is defined above, cost management is one element of supply chain performance. Moving forward, this section of SCOR will be used to guide financial self-sustainability discussions.

Execution Expectations

Using this framework to develop a clear, action-based plan, public health teams can develop self-sustaining supply chains in terms of performance, knowledge base, and financial management. They will have the ability to know and manage their team skill-sets and costs. However, this takes time.

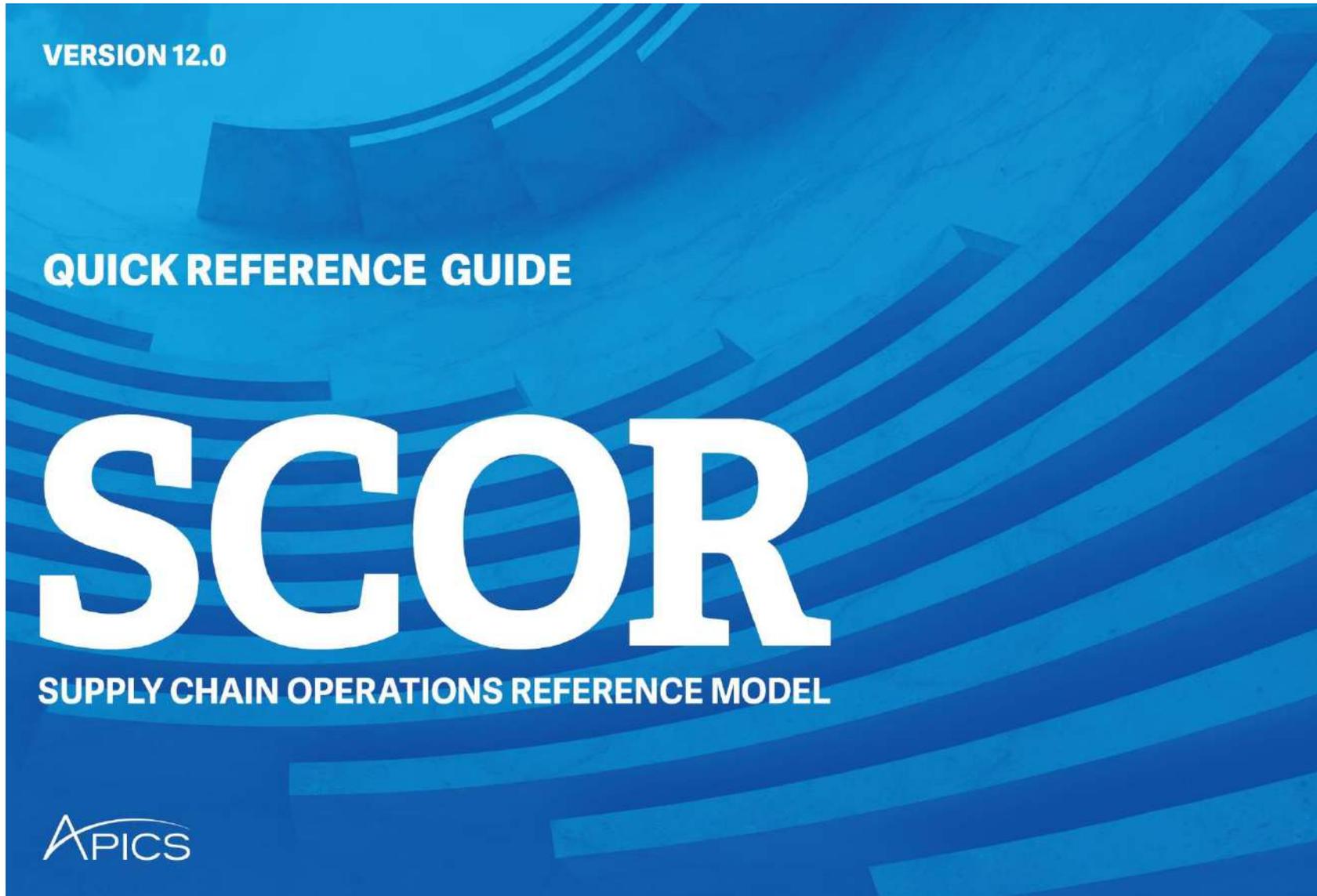
Before presenting a numbers-based plan to transition away from donor funding, it is critical to first be clear on the funding needed for improving and sustaining performance, and the current and expected future donors. In this way, a complete picture can be painted, and data-driven results can be found.

Appendix 1: Frontier Markets Supply Chain Maturity Model

General Comparison of Maturity Levels

	Canvas	Bronze	Silver	Gold	Graduated
Features/Looks like...	<ul style="list-style-type: none"> • Non-functional • Basics don't exist 	<ul style="list-style-type: none"> • Very basic • Manual and people-dependent • No process "controls" 	<ul style="list-style-type: none"> • Basic processes working • Visibility available 	<ul style="list-style-type: none"> • Consistently Functional supply chain • Accountability structures 	<ul style="list-style-type: none"> • Accredited • Level 2 in industry maturity • Capabilities are consistency displayed • Independent from technical and financial assistance from external donors
Performance Indicators	<ul style="list-style-type: none"> • Focus on product availability at service delivery points • < 60% product availability 	<ul style="list-style-type: none"> • 60-85% product availability • Limited visibility 	<ul style="list-style-type: none"> • 85-95% product availability • Full visibility • Some efficiency – e.g., less inventory needed 	<ul style="list-style-type: none"> • >95% availability • Efficiency – e.g., fewer touches, higher turns 	<ul style="list-style-type: none"> • Very lean; low process variability
Key Priorities	<ul style="list-style-type: none"> • Absolute basic capabilities 	<ul style="list-style-type: none"> • Access to cash • Basic visibility • Execute functions more regularly 	<ul style="list-style-type: none"> • Designing smart means to deliver product to last mile vs. collection systems • Visibility to product, information, financials 	<ul style="list-style-type: none"> • Efficiency • Reducing waste in product, time, and money 	<ul style="list-style-type: none"> • Continuous improvement
Investor Implications	<ul style="list-style-type: none"> • Difficult to measure • Focus on progress towards capabilities 	<ul style="list-style-type: none"> • Limited data • "Soft skills" and performance management likely a focus 	<ul style="list-style-type: none"> • Data is available; sharing based on data use agreements 	<ul style="list-style-type: none"> • Governance, accountability, ownership and leadership given data 	<ul style="list-style-type: none"> • Graduation

Appendix 2: SCOR Model Quick Reference Guide



SCOR Processes

The Supply Chain Operations Reference (SCOR) model describes the business activities associated with all phases of satisfying a customer's demand. The model itself is organized around the six primary management processes of Plan, Source, Make, Deliver, Return and Enable. Using these process building blocks, the SCOR model can be used to describe supply chains that are very simple or very complex using a common set of definitions across disparate industries. Today public and private organizations and companies around the world use the model as a foundation for global and site-specific supply chain improvement projects.

SCOR spans all customer interactions (quote to cash), all physical material transactions (procure to payment, including equipment, supplies, spare parts, bulk product, software, etc.) and all market interactions (manufacturing, from the understanding of aggregate demand to the fulfillment of each order).

The model is designed and maintained to support supply chains of various complexities and across multiple industries. The model focuses on three process levels and does not attempt to prescribe how a particular organization should conduct its business or tailor its systems or information flow.

People—Supply Chain Skills

The people section introduced in SCOR 10.0 provides a means for managing talent in the supply chain by incorporating a standard for describing the expertise required to perform tasks and manage processes. The SCOR skills management complements the existing process, metrics, and practice reference components by aligning people and their skills to the processes.

A Skill in SCOR is the capacity to deliver predetermined results with minimal input of time and energy, characterized by a standard definition with associated experience, aptitudes, and training.

Experience is the knowledge or ability acquired by observation or active participation, obtained by doing the work in a real life environment, and undergoing different situations that require different actions.

Training develops a skill or type of behavior through instruction.

All people skills are coded with a capital letter H followed by a capital letter representing the element: S for Skills, E for Experience and T for Training. These are followed by a period and a four digit number. Note: The number in the ID is a unique identifier and does NOT indicate any kind of priority, importance, or other meaning.

sP - Plan					sS - Source			sM - Make			sD - Deliver					
sP1 Plan Supply Chain	sP2 Plan Source	sP3 Plan Make	sP4 Plan Deliver	sP5 Plan Return	sS1 Source Stocked Product	sS2 Source Make-to-Order Product	sS3 Source Engineer-to-Order Product	sM1 Make-to-Stock	sM2 Make-to-Order	sM3 Engineer-to-Order	sD1 Deliver Stocked Product	sD2 Deliver Make-to-Order Product	sD3 Deliver Engineer-to-Order Product	sD4 Deliver Retail Product		
<p>sP1.1: Identify, Prioritize and Aggregate Supply Chain Requirements</p> <p>sP1.2: Identify, Assess and Aggregate Supply Chain Resources</p> <p>sP1.3: Balance Supply Chain Resources with SC Requirements</p> <p>sP1.4: Establish and Communicate Supply Chain Plans</p>	<p>sP2.1: Identify, Prioritize and Aggregate Product Requirements</p> <p>sP2.2: Identify, Assess and Aggregate Product Resources</p> <p>sP2.3: Balance Product Requirements with Product Requirements</p> <p>sP2.4: Establish Sourcing Plans</p>	<p>sP3.1: Identify, Prioritize and Aggregate Production Requirements</p> <p>sP3.2: Identify, Assess and Aggregate Production Resources</p> <p>sP3.3: Balance Production Resources with Production Requirements</p> <p>sP3.4: Establish Production Plans</p>	<p>sP4.1: Identify, Prioritize and Aggregate Delivery Requirements</p> <p>sP4.2: Identify, Assess and Aggregate Delivery Resources</p> <p>sP4.3: Balance Delivery Resources and Capabilities with Delivery Requirements</p> <p>sP4.4: Establish Delivery Plans</p>	<p>sP5.1: Assess and Aggregate Return Requirements</p> <p>sP5.2: Identify, Assess and Aggregate Return Resources</p> <p>sP5.3: Balance Return Resources with Return Requirements</p> <p>sP5.4: Establish and Communicate Return Plans</p>	<p>sS1.1: Schedule Product Deliveries</p> <p>sS1.2: Receive Product</p> <p>sS1.3: Verify Product</p> <p>sS1.4: Transfer Product</p> <p>sS1.5: Authorize Supplier Payment</p>	<p>sS2.1: Schedule Product Deliveries</p> <p>sS2.2: Receive Product</p> <p>sS2.3: Verify Product</p> <p>sS2.4: Transfer Product</p> <p>sS2.5: Authorize Supplier Payment</p>	<p>sS3.1: Identify Sources of Supply</p> <p>sS3.2: Select Final Supplier and Negotiate</p> <p>sS3.3: Schedule Product Deliveries</p> <p>sS3.4: Receive Product</p> <p>sS3.5: Verify Product</p> <p>sS3.6: Transfer Product</p> <p>sS3.7: Authorize Supplier Payment</p>	<p>sM1.1: Schedule Production Activities</p> <p>sM1.2: Issue Material</p> <p>sM1.3: Produce and Test</p> <p>sM1.4: Package</p> <p>sM1.5: Stage Product</p> <p>sM1.6: Release Product to Deliver</p> <p>sM1.7: Waste Disposal</p>	<p>sM2.1: Schedule Production Activities</p> <p>sM2.2: Issue Sourced/In-Process Product</p> <p>sM2.3: Produce and Test</p> <p>sM2.4: Package</p> <p>sM2.5: Finished Product</p> <p>sM2.6: Stage</p> <p>sM2.7: Release Finished Product to Deliver</p> <p>sM2.8: Waste Disposal</p>	<p>sM3.1: Finalize Production Engineering</p> <p>sM3.2: Schedule Production Activities</p> <p>sM3.3: Issue Sourced/In-Process Product</p> <p>sM3.4: Produce and Test</p> <p>sM3.5: Package</p> <p>sM3.6: Stage</p> <p>sM3.7: Release Product to Deliver</p> <p>sM3.8: Waste Disposal</p>	<p>sD1.1: Process Inquiry and Quote</p> <p>sD1.2: Receive, Enter, and Validate Order</p> <p>sD1.3: Reserve Inventory and Determine Delivery Date</p> <p>sD1.4: Consolidate Orders</p> <p>sD1.5: Build Loads</p> <p>sD1.6: Route Shipments</p> <p>sD1.7: Select Carriers and Rate Shipments</p> <p>sD1.8: Receive Product from Source or Make</p> <p>sD1.9: Pick Product</p> <p>sD1.10: Pack Product</p> <p>sD1.11: Load Vehicle & Generate Shipping Docs</p> <p>sD1.12: Ship Product</p> <p>sD1.13: Receive and Verify Product by Customer</p> <p>sD1.14: Install Product</p> <p>sD1.15: Invoice</p>	<p>sD2.1: Process Inquiry and Quote</p> <p>sD2.2: Receive, Configure, Enter and Validate Order</p> <p>sD2.3: Reserve Inventory and Determine Delivery Date</p> <p>sD2.4: Consolidate Orders</p> <p>sD2.5: Build Loads</p> <p>sD2.6: Route Shipments</p> <p>sD2.7: Select Carriers and Rate Shipments</p> <p>sD2.8: Receive Product from Source or Make</p> <p>sD2.9: Pick Product</p> <p>sD2.10: Pack Product</p> <p>sD2.11: Load Product & Generate Shipping Docs</p> <p>sD2.12: Ship Product</p> <p>sD2.13: Receive and Verify Product by Customer</p> <p>sD2.14: Install Product</p> <p>sD2.15: Invoice</p>	<p>sD3.1: Obtain and Respond to RFP/RFQ</p> <p>sD3.2: Negotiate and Receive Contract</p> <p>sD3.3: Enter Order, Commit Resources & Launch Program</p> <p>sD3.4: Schedule Installation</p> <p>sD3.5: Build Loads</p> <p>sD3.6: Route Shipments</p> <p>sD3.7: Select Carriers & Rate Shipments</p> <p>sD3.8: Receive Product from Source or Make</p> <p>sD3.9: Pick Product</p> <p>sD3.10: Pack Product</p> <p>sD3.11: Load Product & Generate Shipping Docs</p> <p>sD3.12: Ship Product</p> <p>sD3.13: Receive and Verify Product by Customer</p> <p>sD3.14: Install Product</p> <p>sD3.15: Invoice</p>	<p>sD4.1: Generate Stocking Schedule</p> <p>sD4.2: Receive Product at Store</p> <p>sD4.3: Pick Product from backroom</p> <p>sD4.4: Stock Shelf</p> <p>sD4.5: Fill Shopping Cart</p> <p>sD4.6: Checkout</p> <p>sD4.7: Deliver and/or Install</p>		
sR - Return					sE - Enable											
sSR1 Source Return Defective Product	sSR2 Source Return MRO Product	sSR3 Source Return Excess Product	sDR1 Deliver Return Defective Product	sDR2 Deliver Return MRO Product	sDR3 Deliver Return Excess Product	sE1 Manage Supply Chain Business Rules	sE2 Manage Supply Chain Performance	sE3 Manage Supply Chain Data and Information	sE4 Manage Supply Chain Human Resources	sE5 Manage Supply Chain Assets	sE6 Manage Supply Chain Contracts	sE7 Manage Supply Chain Network	sE8 Manage Supply Chain Regulatory Compliance	sE9 Manage Supply Chain Risk	sE10 Manage Supply Chain Procurement	sE11 Manage Supply Chain Technology
<p>sSR1.1: Identify Defective Product Condition</p> <p>sSR1.2: Disposition Defective Product</p> <p>sSR1.3: Request Defective Product Return Authorization</p> <p>sSR1.4: Schedule Defective Product Shipment</p> <p>sSR1.5: Return Defective Product</p>	<p>sSR2.1: Identify MRO Product Condition</p> <p>sSR2.2: Disposition MRO Product</p> <p>sSR2.3: Request MRO Return Authorization</p> <p>sSR2.4: Schedule MRO Shipment</p> <p>sSR2.5: Return MRO Product</p>	<p>sSR3.1: Identify Excess Product Condition</p> <p>sSR3.2: Disposition Excess Product</p> <p>sSR3.3: Request Excess Product Return Authorization</p> <p>sSR3.4: Schedule Excess Product Shipment</p> <p>sSR3.5: Return Excess Product</p>	<p>sDR1.1: Authorize Defective Product Return</p> <p>sDR1.2: Schedule Defective Return Receipt</p> <p>sDR1.3: Receive Defective Product (Includes verify)</p> <p>sDR1.4: Transfer Defective Product</p>	<p>sDR2.1: Authorize MRO Product Return</p> <p>sDR2.2: Schedule MRO Return Receipt</p> <p>sDR2.3: Receive MRO Product</p> <p>sDR2.4: Transfer MRO Product</p>	<p>sDR3.1: Authorize Excess Product Return</p> <p>sDR3.2: Schedule Excess Return Receipt</p> <p>sDR3.3: Receive Excess Product</p> <p>sDR3.4: Transfer Excess Product</p>	<p>sE1.1: Gather Business Rule Requirements</p> <p>sE1.2: Interpret Business Rule Requirement</p> <p>sE1.3: Document Business Rule</p> <p>sE1.4: Communicate Business Rule</p> <p>sE1.5: Release/Publish Business Rule</p> <p>sE1.6: Retire Business Rule</p>	<p>sE2.1: Initiate Reporting</p> <p>sE2.2: Analyze Reports</p> <p>sE2.3: Find Root Causes</p> <p>sE2.4: Prioritize Root Causes</p> <p>sE2.5: Develop Corrective Actions</p> <p>sE2.6: Approve & Launch</p>	<p>sE3.1: Receive Maintenance Request</p> <p>sE3.2: Determine/Scope Work</p> <p>sE3.3: Maintain Content/Code</p> <p>sE3.4: Maintain Access</p> <p>sE3.5: Publish Information</p> <p>sE3.6: Verify Information</p>	<p>sE4.1: Identify Skills/Resource Requirement</p> <p>sE4.2: Identify Available Skills/Resources</p> <p>sE4.3: Match Skills/Resources</p> <p>sE4.4: Determine Hiring/Reemployment</p> <p>sE4.5: Clean, Maintain and Repair</p> <p>sE4.6: Decommission and Dispose</p> <p>sE4.7: Inspect Maintenance</p> <p>sE4.8: Reinstated Asset</p>	<p>sE5.1: Schedule Asset Management Activities</p> <p>sE5.2: Take Asset Off-line</p> <p>sE5.3: Inspect and Troubleshoot</p> <p>sE5.4: Install and Configure</p> <p>sE5.5: Clean, Maintain and Repair</p> <p>sE5.6: Decommission and Dispose</p> <p>sE5.7: Inspect Maintenance</p> <p>sE5.8: Reinstated Asset</p>	<p>sE6.1: Receive Contract/Contract Updates</p> <p>sE6.2: Enter and Distribute Contract</p> <p>sE6.3: Activate/Archive Contract</p> <p>sE6.4: Review Contractual Performance</p> <p>sE6.5: Identify Performance Issues/Opportunities</p> <p>sE6.6: Identify Resolutions/Improvements</p> <p>sE6.7: Select, Prioritize and Distribute Resolutions</p>	<p>sE7.1: Select Scope and Organization</p> <p>sE7.2: Gather Input and Data</p> <p>sE7.3: Develop Scenarios</p> <p>sE7.4: Model/Simulate Scenarios</p> <p>sE7.5: Project Impact</p> <p>sE7.6: Select and Approve</p> <p>sE7.7: Develop Change Program</p> <p>sE7.8: Launch Change Program</p>	<p>sE8.1: Monitor Regulatory Entities</p> <p>sE8.2: Assess Regulatory Publications</p> <p>sE8.3: Identify Regulatory Dependencies</p> <p>sE8.4: Define Remediation</p> <p>sE8.5: Verify/Obtain License</p> <p>sE8.6: Publish Remediation</p>	<p>sE9.1: Establish Contact</p> <p>sE9.2: Identify Risk Events</p> <p>sE9.3: Quantify Risks</p> <p>sE9.4: Evaluate Risks</p> <p>sE9.5: Mitigate Risk</p>	<p>sE10.1: Develop Strategy and Plan</p> <p>sE10.2: Pre-Procurement / Market Test and Market Engagement</p> <p>sE10.3: Develop Procurement Documentation</p> <p>sE10.4: Supplier Selection to Participate</p> <p>sE10.5: Issue ITT / RFQ</p> <p>sE10.6: Bid / Tender Evaluation and Validation</p> <p>sE10.7: Contract Award and Implementation</p>	<p>sE11.1: Define Supply Chain Technology Requirements</p> <p>sE11.2: Identify Technology Solution Alternatives</p> <p>sE11.3: Define/Update Supply Chain Technology Roadmap</p> <p>sE11.4: Select Technology Solution</p> <p>sE11.5: Define and Deploy Technology Solution</p> <p>sE11.6: Maintain and Improve Technology Solution</p> <p>sE11.7: Retire Technology Solution</p>

SCOR Practices

A practice is a unique way to configure a process or a set of processes. The uniqueness can be related to the automation of the process, a technology applied in the process, special skills applied to the process, a unique sequence for performing the process, or a unique method for distributing and connecting processes between organizations. All practices have links to one or more processes, one or more metrics and, where available, one or more skills.

SCOR Practices are classified to simplify identification of practices by area of interest:

- Business Process Analysis/Improvement
- Customer Support
- Distribution Management
- Information Management
- Inventory Management
- Material Handling
- New Product Introduction
- Order Engineering (ETO)
- Order Management
- People Management (Training)
- Planning and Forecasting
- Production Execution
- Product Lifecycle Management
- Purchasing/Procurement
- Reverse Logistics
- Risk/Security Management
- Sustainable Supply Chain Management
- Transportation Management
- Warehousing

Special Applications

SustainableSCOR

SustainableSCOR is based upon The GRI Sustainability Reporting Standards (GRI Standards) that are within scope of the SCOR model. GRI Standards are free to use and are available at www.globalreporting.org/standards. The following strategic environmental metrics allow the SCOR model to be used as a framework for environmental accounting:

- **Materials Used**
(Weight or Volume)
- **Energy Consumed**
(Joules, Watt-hours or Multiples)
- **Water Volume Withdrawn**
(Gallons, Liters or Multiples)
- **Air Emissions**
(Metric Tons or Equivalents)
- **Liquid and Solid Wastes**
(Gallons, Liters or Multiples, Weight or Volume)

The SCOR framework ties emissions to the originating processes, providing a structure for measuring environmental performance and identifying where performance can be improved. The hierarchical nature of the model allows strategic environmental footprint goals to be translated to specific targets and activities.

SCOR Performance

The performance or metrics section of SCOR focuses on understanding the outcomes of the supply chain and consists of two types of elements: Performance Attributes and Metrics, and introduces the concept of Process/Practice Maturities.

A **performance attribute** is a grouping or categorization of metrics used to express a specific strategy. An attribute itself cannot be measured; it is used to set strategic direction. For example: "The LX product needs to be leading the competition in reliability" and "The XY-market requires us to be among the top 10 agile manufacturers". Metrics measure the ability to achieve these strategic directions. SCOR recognizes 5 performance attributes:

- Reliability
- Responsiveness
- Agility
- Cost
- Asset Management Efficiency (Assets)

A **metric** is a standard for measurement of the performance of a supply chain or process. SCOR metrics are diagnostic metrics (compare to how diagnosis is used in a medical office). SCOR recognizes three levels of pre-defined metrics:

Level-1 metrics are diagnostics for the overall health of the supply chain. These metrics are also known as strategic metrics and key performance indicators (KPI). Benchmarking level-1 metrics helps establishing realistic targets to support strategic directions.

Level-2 metrics serve as diagnostics for the level-1 metrics. The diagnostic relationship helps to identify the root cause or causes of a performance gap for a level-1 metric.

Level-3 metrics serve as diagnostics for level-2 metrics.

The analysis of performance of metrics from level-1 through 3 is referred to as metrics decomposition, performance diagnosis or metrics root cause analysis. Metrics decomposition is a first step in identifying the processes that need further investigation. (Processes are linked to level-1, level-2 and level-3 metrics).

Reliability	Responsiveness	Agility	Cost	Asset Management Efficiency
RL.1.1 - Perfect Order Fulfillment	RS.1.1 - Order Fulfillment Cycle Time	AG.1.1 - Upside Supply Chain Adaptability	CO.1.1 - Total Supply Chain Management Costs	AM.1.1 - Cash-to-Cash Cycle Time
RL.2.1 - % of Orders Delivered In Full	RS.2.1 - Source Cycle Time	AG.2.1 - Upside Adaptability (Source)	CO.2.1 - Cost to Plan	AM.2.1 - Days Sales Outstanding
RL.3.33 - Delivery Item Accuracy	RS.3.8 - Authorize Supplier Payment Cycle Time	AG.2.2 - Upside Adaptability (Make)	CO.3.1 - Cost to Plan Supply Chain	AM.2.2 - Inventory Days of Supply
RL.3.35 - Delivery Quantity Accuracy	RS.3.35 - Identify Sources of Supply Cycle Time	AG.2.3 - Upside Adaptability (Deliver)	CO.3.2 - Cost to Plan (Source)	AM.3.16 - Inventory Days of Supply (Raw Material)
RL.2.2 - Delivery Performance to Customer Commit Date	RS.3.107 - Receive Product Cycle Time	AG.2.4 - Upside Return Adaptability (Source)	CO.3.3 - Cost to Plan (Make)	AM.3.17 - Inventory Days of Supply (WIP)
RL.3.32 - Customer Commit Date Achievement Time Customer Receiving	RS.3.122 - Schedule Product Deliveries Cycle Time	AG.2.5 - Upside Return Adaptability (Deliver)	CO.3.4 - Cost to Plan (Deliver)	AM.3.23 - Recycle Days of Supply
RL.3.34 - Delivery Location Accuracy	RS.3.125 - Select Supplier and Negotiate Cycle Time	AG.1.2 - Downside Supply Chain Adaptability	CO.3.5 - Cost to Plan (Return)	AM.3.26 - Percentage Defective Inventory
RL.2.3 - Documentation Accuracy	RS.3.139 - Transfer Product Cycle Time	AG.2.6 - Downside Adaptability (Source)	CO.2.2 - Cost to Source	AM.3.37 - Percentage Excess Inventory
RL.3.31 - Compliance Documentation Accuracy	RS.3.140 - Verify Product Cycle Time	AG.2.7 - Downside Adaptability (Make)	CO.3.6 - Cost to Authorize Supplier Payment	AM.3.41 - Percentage Unserviceable MRO Inventory
RL.3.43 - Other Required Documentation Accuracy	RS.2.2 - Make Cycle Time	AG.2.8 - Downside Adaptability (Deliver)	CO.3.7 - Cost to Receive Product	AM.3.45 - Inventory Days of Supply (Finished Goods)
RL.3.45 - Payment Documentation Accuracy	RS.3.33 - Finalize Production Engineering Cycle Time	AG.1.3 - Overall Value at Risk (VAR)	CO.3.8 - Cost to Schedule Product Deliveries	AM.2.3 - Days Payable Outstanding
RL.3.50 - Shipping Documentation Accuracy	RS.3.49 - Issue Material Cycle Time	AG.2.9 - Supplier's/Customer's / Product's Risk Rating	CO.3.9 - Cost to Transfer Product	AM.1.2 - Return on Supply Chain Fixed Assets
RL.2.4 - Perfect Condition	RS.3.101 - Produce and Test Cycle Time	AG.2.10 - Value at Risk (Plan)	CO.3.10 - Cost to Verify Product	AM.2.4 - Supply Chain Revenue
RL.3.12 - % Of Faultless Installations	RS.3.114 - Release Finished Product to Deliver Cycle Time	AG.2.11 - Value at Risk (Source)	CO.2.3 - Cost to Make	AM.2.5 - Supply Chain Fixed Assets
RL.3.24 - % Orders/Lines Received Damage Free	RS.3.123 - Schedule Production Activities Cycle Time	AG.2.12 - Value at Risk (Make)	CO.3.11 - Direct Material Cost	AM.3.11 - Fixed Asset Value (Deliver)
RL.3.41 - Orders Delivered Damage Free Conformance	RS.3.128 - Stage Finished Product Cycle Time	AG.2.13 - Value at Risk (Deliver)	CO.3.12 - Indirect Cost Related to Production	AM.3.18 - Fixed Asset Value (Make)
RL.3.42 - Orders Delivered Defect Free Conformance	RS.3.142 - Package Cycle Time	AG.2.14 - Value at Risk (Return)	CO.3.13 - Direct Labor Cost	AM.3.20 - Fixed Asset Value (Plan)
RL.3.55 - Warranty and Returns	RS.2.3 - Deliver Cycle Time	AG.2.15 - Time to Recovery (TTR)	CO.2.4 - Cost to Deliver	AM.3.24 - Fixed Asset Value (Return)
	RS.3.16 - Build Loads Cycle Time		CO.3.14 - Order Management Costs	AM.3.27 - Fixed Asset Value (Source)
	RS.3.18 - Consolidate Orders Cycle Time		CO.3.15 - Order Delivery and / or Install Costs	AM.1.3 - Return on Working Capital
	RS.3.46 - Install Product Cycle Time		CO.2.5 - Cost to Return	AM.2.6 - Accounts Payable (Payables Outstanding)
	RS.3.51 - Load Product & Generate Shipping Documentation Cycle Time		CO.3.16 - Cost to Source Return	AM.2.7 - Accounts Receivable (Sales Outstanding)
	RS.3.102 - Receive & Verify Product by Customer Cycle Time		CO.3.17 - Cost to Deliver Return	AM.2.8 - Inventory
	RS.3.110 - Receive Product from Source or Make Cycle Time		CO.2.6 - Mitigation Costs	
	RS.3.111 - Receive, Configure, Enter, & Validate Order Cycle Time		CO.3.18 - Risk Mitigation Costs (Plan)	
	RS.3.116 - Reserve Resources and Determine Delivery Date Cycle Time		CO.3.19 - Risk Mitigation Costs (Source)	
	RS.3.117 - Route Shipments Cycle Time		CO.3.20 - Risk Mitigation Costs (Make)	
	RS.3.120 - Schedule Installation Cycle Time		CO.3.21 - Risk Mitigation Costs (Deliver)	
	RS.3.124 - Select Carriers & Rate Shipments Cycle Time		CO.3.22 - Risk Mitigation Costs (Return)	
	RS.3.126 - Ship Product Cycle Time		CO.1.2 - Costs of Goods Sold	
	RS.2.4 - Delivery Retail Cycle Time		CO.2.7 - Direct Labor Cost	
	RS.3.17 - Checkout Cycle Time		CO.2.8 - Direct Material Cost	
	RS.3.32 - Fill Shopping Cart Cycle Time		CO.2.9 - Indirect Cost Related to Production	
	RS.3.34 - Generate Stocking Schedule Cycle Time			
	RS.3.97 - Pick Product from Backroom Cycle Time			
	RS.3.109 - Receive Product at Store Cycle Time			
	RS.3.129 - Stock Shelf Cycle Time			
	RS.2.5 - Return Cycle Time			

About APICS

APICS is the association for supply chain management and the leading provider of research, education and certification programs that elevate supply chain excellence, innovation and resilience. The APICS Certified in Production and Inventory Management (CPIM); APICS Certified Supply Chain Professional (CSCP); APICS Certified in Logistics, Transportation and Distribution (CLTD); and APICS Supply Chain Operations Reference-Professional (SCOR-P) designations set the industry standard. With more than 45,000 members and approximately 300 channel partners, APICS is transforming the way people do business, drive growth and reach global customers.

For more information, visit apics.org/scor.



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Appendix 3: Pillars of Financial Sustainability

In terms of public health, financial sustainability is the government's ability to retain the current level of expenses and taxes over a long period without increasing its liabilities or raising the threat of insolvency of the planned expenses, avoiding bankruptcy.

The concept of financial sustainability is related to the concept of solvency. Solvency is the government's ability to repay its debts or liabilities without reaching bankruptcy status. Financial sustainability can also be defined as the government's ability to perform a set of planned strategies to retain solvency for an unlimited period of time (Stasytytė, 2015; Burnside, 2003).

The Four Pillars of Financial Sustainability (León, 2001).



Pillar 1: Strategic and Financial Planning

Strategic planning is the mechanism that states an organisation's mission and objectives, and prioritises the actions needed to accomplish them. Financial planning makes it possible to convert the actions described in the strategic plan into figures (León, 2012). A state's resource availability or its capacity to acquire new resources to implement its strategy relies heavily on its financial planning process.

A state financial plan of action consists of projected expenditures and projected income to cover those

expenditures. It should consider cost-recovery objectives, capitalisation requirements, and long-term financial needs (León, 2012; Management Sciences for Health, 2012).

Pillar 2: Income Diversification

Even if a state has 20 donors, it will remain extremely vulnerable if a large portion of the budget depends on only two of them. Any change in these donors' decisions could induce a major crisis.

Pillar 3: Sound Administration and Finance

Knowing how to manage resources is as essential to achieving financial sustainability as knowing how to generate income (León, 2012). Financial management activities cut across all tiers and levels of the health system, right down to the facility, including administration, accounts, pharmacy, stores, maintenance, and other service units (laboratory, x-ray, theatre, scanning, etc.). Financial management guidelines, along with a plan, are therefore needed to optimise financial transactions in the supply chain, whether or not the accounting system is computerised, partly computerised, or manual (Steele *et al.*, 2017).

Pillar 4: Own Income Generation

Own income generation is one of the ways that an agency can diversify its sources of revenue and achieve financial sustainability. For example, as a non-governmental organisation, UNICEF procures key health commodities, such as vaccines, on behalf of governments in low- and middle-income countries. The Cost Estimate that UNICEF gives to those governments normally includes the cost of goods, handling fee, freight and insurance, buffer stock, and INCOTERMS.

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