





# BUSINESS CASE FOR THE IMPLEMENTATION OF GLOBAL STANDARDS

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# ACRONYMS

<b>AIDC</b>	.....automatic identifier and data capture
<b>AI</b>	.....application identifier
<b>ASN</b>	.....advance ship notice
<b>CMS</b>	.....central medical store
<b>CPG</b>	.....consumer packaged goods
<b>DC</b>	.....distribution center
<b>EAN</b>	.....European Article Number
<b>EDI</b>	.....electronic data interchange
<b>EPC</b>	.....Electronic Product Code
<b>EPCIS</b>	.....Electronic Product Code Information Services
<b>FAQ</b>	.....frequently asked question
<b>FEFO</b>	.....first-expired first-out
<b>IT</b>	.....information technology
<b>ITF</b>	.....interleaved two-of-five
<b>GDSN</b>	..... Global Data Synchronization Network
<b>GIAI</b>	.....Global Individual Asset Identifier
<b>GHSC</b>	.....Global Health Supply Chain
<b>GLN</b>	.....Global Location Number
<b>GPO</b>	.....group purchasing organization
<b>GRAI</b>	.....Global Returnable Asset Identifier
<b>GTIN</b>	.....Global Trade Item Number
<b>GTS</b>	.....global traceability standard
<b>HRI</b>	.....human readable interpretation
<b>KPI</b>	.....key performance indicator
<b>MAPE</b>	.....mean absolute percentage error
<b>MDM</b>	.....master data management
<b>MIS</b>	.....management information system
<b>MO</b>	..... Member Organization
<b>PO</b>	.....purchase order
<b>PSM</b>	.....Procurement and Supply Management
<b>RDC</b>	..... regional distribution center
<b>RFID</b>	.....radio frequency identification device
<b>RHSC</b>	.....Reproductive Health Supplies Coalition
<b>RSS</b>	.....Reduced Space Symbology
<b>SSCC</b>	.....Serialized Shipping Container Code

**TDM** ..... Technical Direction Memorandum  
**UPC** ..... Universal Product Code  
**UNFPA** ..... United Nations Population Fund  
**USAID** ..... U.S. Agency for International Development  
**WHO** ..... World Health Organization  
**WIP** ..... work in progress  
**XML** ..... Extensible Markup Language

# EXECUTIVE SUMMARY

The USAID Global Health Supply Chain Program (GHSC) brings a new approach to achieving the agency's global health priorities. The goal is to reduce costs and increase efficiencies in global and national supply chains **in order to reach more people and save more lives.**

To support those efforts, the USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project is committed to **incorporating lessons learned** over the last decade of global health supply chain management and **exploring industry innovations that will lead to better, more efficient supply chain.** Core objectives include:

- guiding and strengthening supply-chain processes from procurement to storage to delivery
- leveraging technology and data systems to better coordinate resources and collaborate on supply chain solutions
- ensuring that country leaders and other partners have the information they need to make strategic decisions and facilitate action

Central to achieving these goals is the implementation and use of global supply chain standards for product identification, location identification, and product master data. USAID has been investigating the use of global standards to improve the management of health commodity procurement for a number of years. Their investigation revealed that use of global standards was a strategic enabler for supply chain efficiency, effectiveness and innovation for numerous industries across the globe for decades. USAID's research and findings solidified their interest in and commitment to adopting global standards.

This direction was formalized in a Technical Direction Memorandum (TDM) from USAID to GHSC-PSM on April 25, 2017. The TDM set a mandate for GHSC-PSM to develop a strategic and coordinated approach for the adoption of global standards (namely GS1 standards for product identification, data capture, and data sharing) across its global and in-country activities. Thus, adoption of global standards has become a central part of the GHSC program to reduce costs, improve efficiency, and **improve the availability of health commodities worldwide.**

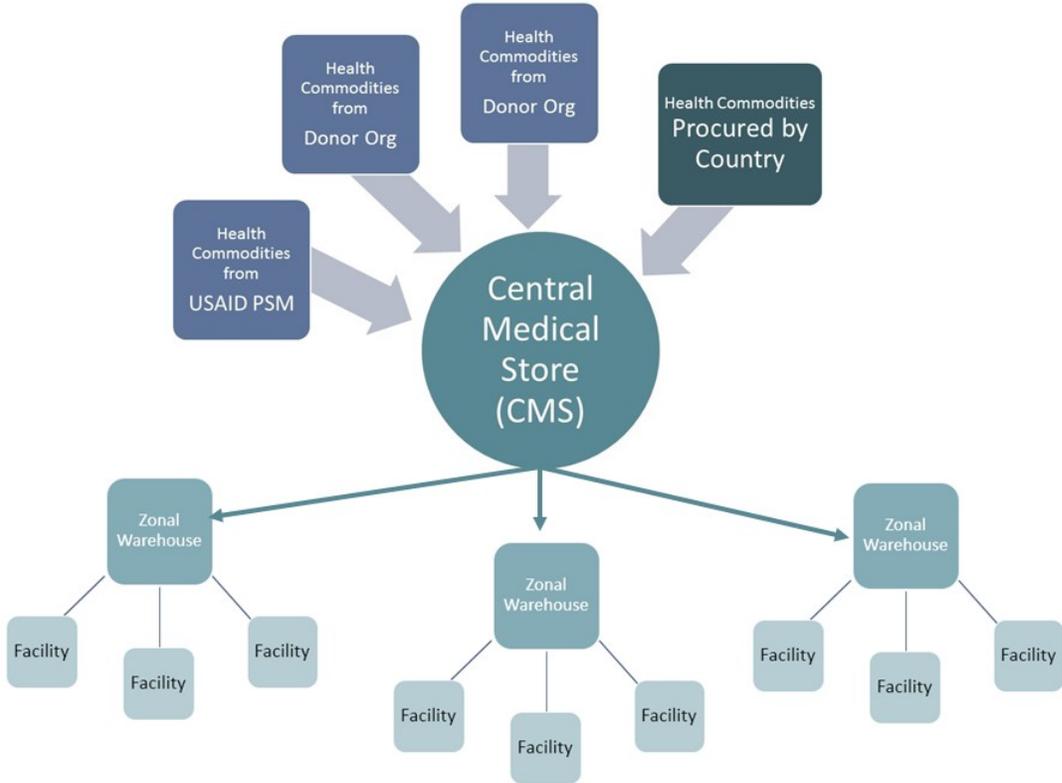
This document presents the business case for adoption and implementation of global standards. To that end, this document discusses:

- the current approach to product identification, party/location identification, and master data management in the global health supply chain,
- problems and issues caused by the current approach,
- how standards can help resolve those issues, and
- the standards implementation process, including metrics that can be used to help measure progress.

# GLOBAL HEALTH SUPPLY CHAINS

Global health supply chains are extremely complex: numerous donor organizations running numerous health initiatives to provide numerous health commodities from numerous suppliers to numerous recipient countries. A common approach is for health commodities to be received in-country at a Central Medical Store (CMS), at which point the recipient country manages the national distribution channel to distribute health commodities downstream (from the CMS to zonal warehouses or hubs, to sub-hubs, and ultimately to facilities). Variations to this common approach include receiving at zonal receiving centers (i.e., regional distribution centers (RDC)) instead of a CMS, and/or in-country parallel supply chains run by donors or private industries.

Figure 1: Common Approach for Receipt & Distribution of Health Commodities in Recipient Countries



Today, there is no widespread use of supply chain data standards by the donor community or recipient countries, creating operational and informational challenges for all participants. USAID’s adoption of GS1 standards, along with its partnerships and collaboration with other donor organizations and recipient countries, provides an opportunity for positive transformation across the global health supply chain.

## CHALLENGES

As shown above, global health supply chains bring together governmental and non-governmental aid organizations, recipient countries, and health commodity suppliers from around the globe. Their work is a collaborative effort aimed at forecasting and monitoring health commodity needs and **ensuring**

**uninterrupted supply of health commodities worldwide.** However, this effort has faced significant challenges under current supply chain management practices:

- Inability to identify and aggregate what is being bought, sold and sent to different countries from global donors and procurers including governments
- Lack of visibility into shipments received in country (e.g., no barcoding; no electronic sourcing; inconsistent shipping documents; etc.)
- Inability of aid recipients to effectively identify, monitor and report usage and replenishment needs

All of these challenges are a result of the current approach to supply chain data and processes in the global health supply chain.

## **CURRENT APPROACH TO SUPPLY CHAIN INFORMATION**

As described above, global health supply chains are a collaborative effort. What starts as a network of disparate global supply chains run by different donors and procurement agencies, often converge when products reach national CMSs. These supply chains rely on trading partners to share data. However, the current approach to managing and sharing supply chain information undermines the value and use of global health supply chain data.

### **Product Identification**

Most global health organizations and their procurement agencies are using proprietary codes to identify products. These identifiers can change as an item moves through the supply chain, and more than one proprietary identifier may be assigned and used for the same product. Moreover, because proprietary identifiers are not based on standards, any barcode in which the identifier may be encoded is not readable by anyone other than the party that assigned the identifier. Therefore, the use of barcode scanning to identify health commodities is extremely limited in recipient countries.<sup>1</sup>

### **Logistics Unit Identification**

There is currently no widespread use of standardized identifiers, labels, and transaction documents for logistics units. This means that pallets often move through the supply chain with no ability to track those units and arrive in countries with no ability to connect the physical pallet with the associated transaction documents (i.e. purchase order (PO), advance ship notice (ASN), packing list, commercial invoice, etc.) without breaking down the package and conducting research based on the contents.

### **Location and Party Identification**

Proprietary identifiers are being used to identify locations and parties in the global health supply chain. These identifiers are created and maintained by individual supply chain partners, and each unique business relationship between two global health supply chain partners produces a set of proprietary party/location numbers specific to that relationship. These practices result in numerous identifiers for

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<sup>1</sup> GS1 US (March 2012). [GS1 US Healthcare Supplier Toolkit: Global Trade Item Number® \(GTIN®\)](#).  
GS1 US (2015). [GS1 US Healthcare Provider Toolkit: Global Trade Item Number® \(GTIN®\)](#).

the same party/location, and these identifiers do not necessarily have one-to-one correlation depending on the strategy of the assigning party (i.e., assign identifiers to recipient countries; assign identifiers to central warehouse location; assign identifiers to any/all shipping locations; etc.).<sup>2</sup>

### **Product Master Data**

There are many organizations and systems across the global health supply chain that use and rely on information about health commodities (e.g., plan; procurement; quality assurance; logistics; billing/accounts payable; etc.). Although each organization has many systems using information about products, there is typically no central database at the organization that houses all of that information and ensures that it is accurate and up-to-date (i.e., an “authoritative source” for information). Instead, each system generally uses its own database. As a result, there is no method for ensuring that the product information being used in one system and/or by one organization is the same as the information being used in another. Moreover, these organizations manually maintain this information in their systems, relying on ad hoc supplier updates when attributes relating to a specific item are changed. Whenever a supplier updates or changes any of its product information, all of the disparate systems and databases that rely on that information must be updated individually.<sup>3</sup>

### **CURRENT APPROACH TO SUPPLY CHAIN PROCESSES**

As described above, the current approach to supply chain information creates a state of “data chaos” and presents a challenge to data visibility within an organization’s supply chain that is exacerbated when transacting across supply chains. Without standards, supply chain partners and systems (e.g., purchasing, inventory management, logistics, reporting, etc.) each use their own identifiers and data formats. This approach breaks the connection between those systems, creating islands of automation with territorial demarcations across global health partners, product lines, geographical markets and/or channel of distribution (i.e., information technology (IT)) systems using different product identifiers and thereby inhibiting visibility and analytics).<sup>4</sup>

Because of this, global health supply chains are not able to effectively utilize technology in operational processes (e.g., automatic identification and data capture (AIDC); electronic transactions; IT; business analytics; etc.). Instead, global health supply chain processes are predominantly manual processes like phone calls, fax, manual data entry, data re-entry, visual inspection, paper transactions and documentation, manual receiving, and visual inventory management

These manual processes create a high-maintenance, error-prone environment characterized by duplication of effort, errors, delays, inaccurate data, and supply chain inefficiency.

### **THE REAL WORLD IMPACT**

Inefficient and ineffective supply chain practices add complexity and cost and have real world consequences. On average, donors spend US \$17-20 billion on humanitarian assistance each year.<sup>5</sup>

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<sup>2</sup> GS1 US (August 2015). [GS1 US Healthcare Supplier Toolkit: Global Location Number \(GLN\)](#).

GS1 US (September 2015). [GS1 US Healthcare Provider Toolkit: Global Location Number \(GLN\)](#).

<sup>3</sup> GS1 US (March 2012). [GS1 US Healthcare Supplier Toolkit: Global Data Synchronization Network™ \(GDSN®\)](#).

GS1 US (March 2012). [GS1 US Healthcare Provider Toolkit: Global Data Synchronization Network™ \(GDSN®\)](#).

<sup>4</sup> GS1 US (2015). [GS1 Standards & Hospital Supply Chain Operations: Transforming Healthcare Providers into Data-Driven Organizations](#).

<sup>5</sup> Aid & International Development Forum (2015). Operational Efficiency and Supply Chain Management. Retrieved from <http://www.aidforum.org/disaster-relief/operational-efficiency-and-supply-chain-management>

According to one study, **60-80% of that investment is spent on logistics and supply chain management.**<sup>6</sup> In the commercial world, this would be a staggering statistic. Although global health development assistance programs generally have more advanced planning and visibility than disaster relief programs, these statistics can offer a certain level of insight as both operate in the complex environment of global assistance programs.

To understand the financial drain of inefficient supply chain management, consider the following findings<sup>7</sup> about the U.S. healthcare industry which has similar approaches to supply chain information and processes:

- The use of inaccurate supply chain information costs the U.S. healthcare industry billions of dollars annually.
- The U.S. healthcare supply chain spends 24% to 30% of administration time *every day* on data cleansing and corrections – costing the U.S. healthcare industry \$2 to \$5 billion each year due to supply chain information inefficiencies.
- Although hospital product information is constantly being updated, 30% of buyer systems are inaccurate. As a result, many U.S. healthcare buyers are sourcing products using old information – and each of the resulting erroneous transactions costs \$60 to \$80 to correct.
- 60% of all invoices generated in the U.S. healthcare supply chain have errors – and each invoice error costs \$40 to \$400 to reconcile.
- Erroneous data increases supply costs 3% to 5%.
- Hospitals, group purchasing organizations (GPOs), and suppliers spend in excess of \$5 million annually to “align” product information (i.e., ensure that all of them have and are using the same information). However, those efforts often rely on “non-authoritative sources” of information that may be inaccurate and/or out of date – undermining the effectiveness of the effort and the value of the investment.<sup>8</sup>

In the absence of a similar study of the global health industry, the global health community, which uses similar approaches to supply chain information and processes, should consider these findings and statistics as indicators of how much waste may be occurring in their supply chain due to inefficiency.

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<sup>6</sup> Van Casanova, L. N. (2006). Blackett Memorial Lecture, Humanitarian Aid Logistics: Supply Chain Management in a High Gear. *The Journal of the Operational Research Society*, 57(5), 475–489.

<sup>7</sup> Rosenfeld, William L. & Seltzer, John L. (2016). [Data Synchronization in Healthcare: A Solvable Problem](#), Sterling Commerce. Retrieved from [https://docuri.com/download/datasynchronizationinhealthcareasolvableproblem\\_59bf3a77f581716e46c4b54c\\_pdf](https://docuri.com/download/datasynchronizationinhealthcareasolvableproblem_59bf3a77f581716e46c4b54c_pdf)

<sup>8</sup> GS1 US (March 2012). [GS1 US Healthcare Supplier Toolkit: Global Data Synchronization Network™ \(GDSN®\)](#). GS1 US (March 2012). [GS1 US Healthcare Provider Toolkit: Global Data Synchronization Network™ \(GDSN®\)](#).

# THE MOVE TO GLOBAL STANDARDS

Current supply chain management practices in global health supply chains inhibit optimization of IT systems and drain supply chain business processes. The GHSC-PSM project is committed to incorporating lessons learned over the last decade of global health supply chain management and exploring industry innovations that will lead to better, more efficient supply chain. Adoption of global standards is a central part of that effort.

USAID has been investigating the use of global standards to improve the management of health commodity procurements for a number of years. Their investigation revealed that use of global standards was a strategic enabler for supply chain efficiency, effectiveness and innovation for numerous industries across the globe for decades. Therefore, in order to reduce costs, improve efficiency, and improve the availability of health commodities worldwide, GHSC-PSM is committed to the implementation and use of the following global standards for product identification, location identification, and product master data.

## PRODUCT IDENTIFICATION

### GS1 Global Trade Item Number

The Global Trade Item Number® (GTIN®) is the GS1 standards-based, globally unique identifier for “trade items” (i.e., products that may be priced, ordered or invoiced). The GTIN enables supply chain partners to use the same standards-based identifier to identify products in a standardized data format in all supply chain transactions, supply chain communications, and internal systems. Because they are standardized, GTINs can be encoded in barcodes to identify products as they move through the supply chain and be read and interpreted in the same way by all trading partners. Additional information like batch/lot number, expiration date, and serial number can also be encoded along with the GTIN.<sup>9</sup>

### Serial Number

A serial number is a numeric or alphanumeric code assigned to an individual instance of an entity for its lifetime. Using GS1 standards, the combination of a GTIN plus serial number uniquely identifies an individual item and can be used as needed in supply chain transactions, supply chain communications, and internal systems. For example, if hypothetical GTIN 00361414567894 is assigned to identify a 100-count bottle of XYZ tablets, then the combination of GTIN 00361414567894 plus a serial number would identify a specific 100-count bottle of XYZ tablets. All bottles of XYZ tablets would have the same GTIN, but each bottle would be assigned a unique serial number.<sup>10</sup>

## LOGISTICS UNIT IDENTIFICATION

### Serial Shipping Container Code

The Serial Shipping Container Code (SSCC) is the GS1 standards-based, identifier for “logistics units” (i.e., any combination of trade items packaged together for storage and/or transport purposes). The SSCC enables supply chain partners to track individual logistics units (e.g. pallets or cases) for efficient order and transport management in a standardized data format. The SSCC also enables companies to

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<sup>9</sup> GS1 US (September 2017). [An Introduction to Global Trade Item Number \(GTIN\)](#).

<sup>10</sup> GS1 US (2016). [Implementation Guideline: Applying GS1 Standards for DSCSA and Traceability](#).

link information about a logistics unit between the physical package and its contents (i.e. GTINs and serial numbers) and the associated transaction documents (i.e. PO, packing list, ASN, commercial invoice, etc.).<sup>11</sup>

## **PARTY & LOCATION IDENTIFICATION**

### **GS1 Global Location Number (GLN)**

The Global Location Number (GLN) is the GS1 standards-based, globally unique identifier for supply chain parties and locations. The GLN enables supply chain partners to use the same standards-based identifier to identify parties and locations in a standardized data format. Supply chain partners can use GLNs to identify parties and locations in all supply chain transactions, supply chain communications, and internal systems.<sup>12</sup>

## **PRODUCT DATA**

### **GS1 Global Data Synchronization Network (GDSN)**

The Global Data Synchronization Network™ (GDSN®) is the GS1 solution for reliable product information within an organization and across supply chains. The GDSN enables organizations to establish one, authoritative source of product information from which all systems in the organization can pull. In addition, the GDSN provides a highly efficient automated process for ensuring that the information in that central source is reliable, accurate, properly formatted, and up-to-date. With the GDSN, organizations can establish one authoritative source of product information to feed all of their systems with the same reliable information used by all of their suppliers and supply chain partners.<sup>13</sup>

## **THE GS1 SYSTEM OF STANDARDS**

From an information management point of view, supply chain systems and processes require all parties to systematically associate the physical flow of products with the flow of information about them. This is best attained by deploying a common business language within the framework of a comprehensive standards system. The GS1 system of standards is such a system, providing a comprehensive platform for companies to identify products and other business entities, capture supply chain data, and share data with trading partners.<sup>14</sup>

The GS1 System encompasses identification standards, data standards, automatic identification data capture (AIDC) standards, and data communication standards. The table below summarizes some of the GS1 Standards that support supply chain management and visibility:<sup>15</sup>

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<sup>11</sup> GS1 US (2017). [An Introduction to the Serial Shipping Container Code \(SSCC\)](#).

<sup>12</sup> GS1 US (September 2017). [An Introduction to the Global Location Number \(GLN\)](#).

<sup>13</sup> GS1 US (March 2012). [GS1 US Healthcare Supplier Toolkit: Global Data Synchronization Network™ \(GDSN®\)](#).  
GS1 US (March 2012). [GS1 US Healthcare Provider Toolkit: Global Data Synchronization Network™ \(GDSN®\)](#).

<sup>14</sup> GS1 (November 2012). [GS1 Global Traceability Standard](#).

<sup>15</sup> GS1 US (2016). [Implementation Guideline: Applying GS1 Standards for DSCSA and Traceability](#) (page 34).

GS1 Standards for Healthcare Supply Chain Management			
Identification Standards	Trade Items	Global Trade Item Number (GTIN)	
	Locations & Parties	Global Location Number (GLN)	
	Logistics Units	Serial Shipping Container Code (SSCC)	
AIDC Standards	GS1 Barcodes	GS1-128 GS1 DataMatrix	
	GS1 EPC/RFID		
Data Standards	<b>Master Data:</b> Global Data Dictionary Item Bus. Messaging Std.	<b>Transactional Data:</b> eCom/EDI	<b>Event Data:</b> EPCIS Schema EPCIS Core Bus. Vocab.
Sharing & Communication Standards	<b>Master Data:</b> GDSN Data Hub   Location	<b>Transactional Data:</b> AS2	<b>Event Data:</b> EPCIS Capture EPCIS Query Discovery Services

### SUPPLY CHAIN TRANSFORMATION

Without standards, trading partners and systems (e.g., purchasing, inventory management, logistics, reporting, etc.) each use their own identifiers and data formats. This approach breaks the connection between those systems, creating a high-maintenance, error-prone environment that adds complexity, inaccuracy and cost. Using standards maintains their connection, enabling systems to be used collectively to enhance the quality and amount of data available to support operational processes. These capabilities and the associated benefits are why standards are such an integral part of data-driven industries like grocery, retail, etc., and why the effort to adopt standards and implement them in the global health supply chain presents such a tremendous opportunity.<sup>16</sup>

Numerous industries like grocery, retail, and consumer packaged goods (CPG) have long understood the “make or break” connection between supply chain and performance, and the essential role that supply chain operations play in their success or failure. They are information-driven industries that manage not only the physical flow of products, but also the flow of information about those products. They optimize supply chain information across their business processes and systems to fuel operational efficiencies and process improvements. They also manage the flow of detailed spend, usage and outcome data on the reverse side to gain visibility and guide strategic decision-making to reduce costs, enhance quality, and elevate performance.<sup>17</sup>

<sup>16</sup> GS1 US (2015). [GS1 Standards & Hospital Supply Chain Operations: Transforming Healthcare Providers into Data-Driven Organizations](#) (pages 1-2).

<sup>17</sup> GS1 US (2015). [GS1 Standards & Hospital Supply Chain Operations: Transforming Healthcare Providers into Data-Driven Organizations](#) (pages 3-4).

In order to empower the global health community to become an information-driven supply chain, it needs to better leverage information technologies to transform operations and improve performance. In the past, lack of standards has been a major roadblock to IT optimization, and legacy business processes were developed/created to function in that environment.<sup>18</sup> The opportunity presented through the implementation of GS1 standards is not to simply add GTINs and GLNs to the mix. Rather, the opportunity is to leverage the standards to drive process efficiency in operations and provide much needed levels of visibility into the products purchased, delivered, stored, recalled and consumed throughout the global health supply chain. This visibility not only improves operations and performance – but it also provides a strong foundation for addressing supply chain issues like diversion and counterfeit.

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<sup>18</sup> GS1 US (2015). [GS1 Standards & Hospital Supply Chain Operations: Transforming Healthcare Providers into Data-Driven Organizations](#) (page 1).

# IMPLEMENTING GLOBAL STANDARDS

Many organizations struggle with understanding what it means to “implement standards.” In reality, standards implementation is a phased, iterative process with a learning curve that builds each capability piece by piece. Standards are not “plug and play.” It’s important to remember that it’s a process – not a finish line.

GHSC-PSM aims to implement global standards to improve end-to-end data visibility and supply chain efficiency and security. The GHSC-PSM vision is to enable identification of every item procured at every point in the supply chain, through administration to the patient. The goal is to use standards to enable a secure and efficient supply chain from source to service delivery. Global standards to be implemented include:

- Product, logistics unit, and location identification
- Product master data
- Packaging, presentation, and data capture
- Data exchange of orders, shipment status, and delivery notification

Implementation is not simply a technical/systems effort. In fact, if the standards are not implemented in business processes as well as systems, the benefits of the standards will be severely inhibited. Therefore, the dual hallmarks of standards implementation are integrating standards into IT systems and integrating standards into business processes.

## INTEGRATION INTO IT SYSTEMS

Integration of standards into IT systems will involve databases, applications, and over-arching enterprise architecture. The database integration is not simply a matter of adding a GTIN field. Rather, the database effort encompasses alignment of product master data with standardized GDSN attributes, on-boarding with a GDSN-certified data pool, and establishing formal data quality and governance program. The integration of standards into application systems involves integrating the GTIN and GLN in user interfaces and system work-flows, in addition to enterprise architecture that requires the system’s data strategy to pull product data from the organizations’ authoritative data source that is maintained by the GDSN, as well as push supply chain transaction and event data to an authorized data repository. In addition, certain application functionalities will likely need to be modified to take advantage of the standards’ structured approach to supply chain information.

## INTEGRATION INTO BUSINESS PROCESSES

The implementation of GS1 standards across USAID’s supply chain and systems supports *automated connections* between and among systems to push/pull/view more data, automate business process, support analytics and reporting, etc. This can and should be transformational for business processes.

The evolution from implementing the standards in IT systems to implementing them in business processes marks an important transition for any standards adoption effort. The effort involves reviewing business processes in light of the new technical capabilities (e.g., AIDC; electronic transactions; etc.) to identify opportunities to optimize supply chain information across business

processes to fuel operational efficiencies and process improvements. It is a vital turning point where an organization methodically charts a course for improving operations and seeing real world results.

Key business processes for each supply chain participant to examine are identified below:

Supply Chain Participant	Core Processes
Donor Organization Sourcing & Procurement	Product master data management (MDM) & data quality Demand planning & requisition management Order-to-cash transactions Procure-to-pay transactions
Donor Organization Warehouses & RDCs	Efficient receiving (pallet level) Disaggregation management First-expired first-out (FEFO) management Aggregation management Shipping
Recipient Country CMS/MSD	Product MDM Efficient receiving (pallet and/or case level) Disaggregation management (pallet to case) FEFO management (case level) Order management (case level) Aggregation management (level varies) Shipping
Recipient Country Hubs & Warehouses	Efficient receiving (level varies) Disaggregation management (pallet to case) FEFO management (case level) Order management (case level) Aggregation management Shipping
Recipient Country Facilities	Efficient receiving (case level) Disaggregation management (case to item) FEFO management (item level) Inventory management (item level)

- Key standards implementation activities to support sourcing/procurement is product identification (GTINs), master data management (GDSN), and order-to-cash and procure-to-pay transactions.
- Key standards implementation activities to support all other participants include barcoding, logistics labelling, and logistics transactions (e.g. ASN).

The next section presents best practices for implementing standards in business processes, and the next chapter lays out the framework for how to manage the process.

## **BEST PRACTICES**

- Set expectations and planning around implementing and using foundational elements across systems piece by piece for certain capabilities (e.g., master data = GTIN and GDSN; order process = PO; etc.).
- Plan to conduct pilot testing with one or two key partners prior to wide scale implementation if/where possible.
- Incorporate time to integrate learnings from implementation and use of each piece to drive momentum and promote success.
- Identify benefits expected for each use and metrics for measuring them. Measure and monitor metrics throughout each phase to highlight benefits achieved as well as any potential adjustments that may need to be made.
- Standards education and experience is a key performance indicator for success throughout the process. Plan rollout to leverage education and experience through each phase.

# USING GLOBAL STANDARDS TO IMPROVE PERFORMANCE

The standards adoption lifecycle comprises four phases:

- Awareness – where an organization learns about the existence of standards and what standards are
- Adoption – where an organization learns about the benefits of using standards, examines its own business needs, and commits to implement the standards
- Implementation – where an organization implements the standards in its IT systems and business processes
- Use – where an organization uses the standards to improve business processes and enhance performance

As discussed above, the transition from implementation to use marks an important turning point where an organization has laid the necessary foundation and is ready to begin using the standards in its operations to improve performance. However, standards are not plug-and-play. Thus, the central question for any organization making this transition is “how?”.

## THE IMPORTANCE OF METRICS, KPI AND BENCHMARKS

Metrics are an essential element of supply chain management and improvement efforts. Metrics are statistics about financial and operational activities. Key performance indicators (KPI) are metrics that have been identified as important indicators of overall performance. The metrics serving as KPI vary by industry. Benchmarks are metric scores (often an industry average) against which an organization can compare its own scores to assess performance.

Metrics shine light on opportunities for improvement, and provide data to monitor progress and assess benefits. In fact, measuring and monitoring metrics is a core activity for organizations in the commercial world where an efficient and effective supply chain is a competitive necessity. Commercial organizations fixate on a host of metrics to help them monitor performance for any weakness they can address and/or opportunity they can leverage. In fact, they measure them regularly, some even weekly or daily, to check for outliers that signal issues and present opportunities to mitigate problems. In the commercial world, this is an absolute necessity as it directly impacts their bottom-line.

In global health supply chains, the stakes are much higher: saving lives and reducing the disease burden around the world. The goal of the GHSC-PSM project is to reach millions more people through increased efficiencies and cost savings. This will require on-going improvements to operations and business processes. An old supply chain maxim states, “*you can’t improve what you don’t measure.*” Therefore, it makes sense for the global health community to follow the industry best practice of measuring and monitoring supply chain metrics as an essential part of the effort to reach more people and save more lives.

## INDUSTRY METRICS

There are a wide variety of industry metrics available today. Different kinds of metrics are used to measure different aspects of performance (e.g., financial; order-to-cash; logistics; distribution; forecasting; planning; etc.). Most metrics are calculated using data readily available in IT systems (e.g., dates, costs, quantities, etc.). This is why standards are so important: they enable data from disparate systems to be compiled for business intelligence and analytics. Other metrics, usually operational metrics seeking more granular information, rely on observational data captured live during a test period (e.g., time to unload/load a pallet).

The table below presents a list of industry metrics compiled to support global health supply chain goals. The list identifies metrics currently collected by GHSC-PSM, as well as metrics not currently collected but for which the data is available.

Industry Metric	Currently collected by GHSC PSM	Not currently collected by GHSC PSM, but data is available
<b>Financial</b>		
Supply chain cost as a percentage of revenue	X (variants)	X
Transportation cost as a percentage of revenue		X
Distribution cost as a percentage of revenue		X
Outbound freight cost		X
Inbound freight cost		X
<b>Supply Chain Management</b>		
Inventory turns	X	
On-time delivery to customer	X	
Outbound order fulfillment lead time		X (disaggregating cycle time)
Stockout rate	X	
Shrink due to expiration	X	
Shrink due to theft, damage or other causes	X	
<b>Sourcing</b>		
Supplier on-time delivery	X	
Fill rate on closed orders	X	
Perfect order	X	
Outgoing product quality (PPM)	X	
<b>Transportation</b>		
On-time delivery	X (by type)	X (aggregated total)
On-time pickup		X

Industry Metric	Currently collected by GHSC PSM	Not currently collected by GHSC PSM, but data is available
Proof of delivery		X
<b>Distribution &amp; Warehouse</b>		
On-time delivery		X

## KEY STEPS TO OPERATIONAL IMPROVEMENT

The transition to using standards to improve performance is a methodical process involving business process analysis and supply chain metrics. At a high level, it can be summarized as follows:

- Define goals and performance expectations by developing a strategic plan.
- Calculate scores for key industry metrics to obtain an assessment of current performance (i.e., “before metrics”).
- Identify performance gaps by comparing those scores to benchmarks for applicable industries and identify target areas / opportunities for improvements based on variance from industry performance norms.
- Map operational flow to identify processes that impact performance gaps, including sources and root causes.
- Identify the associated business processes and analyze how they can be improved using standards (e.g., identifiers; attributes; AIDC; transactional data; etc.).
- Develop a corrective action plan to implement standards for improvement.
- Pilot test the redesigned business process. Monitor corrective actions and measure the impact throughout the pilot leveraging KPIs.
- Conduct high level cost/benefit analysis to determine scalability.
- Adjust business processes and standards application as needed to close performance gaps.
- Formally implement new business processes across the organization. Enable sustainability through any necessary training and education required to maintain and prolong operations.
- Collect scores for the associated metrics on a regular, on-going basis (i.e., “after metrics”) to continually monitor results and performance.

This process will occur individually at organizations, collaboratively among supply chain partners, and ultimately across the entire supply chain. It will be an on-going, iterative effort to improve operations and see real world results one business process at a time.

# CONCLUSION

Supply chain standards for product identification, party/location identification, and master data management have not been widely used by the donor community or recipient countries in the global health supply chain. The absence of standards has undermined the value and use of supply chain data, and created operational and informational challenges for all participants.

In response, USAID has mandated adoption and use of global standards as a central part of the GHSC program to improve the management of health commodity procurement. Global standards increase the quality and amount of data available to support operational processes, and have been used by numerous industries across the globe for decades to fuel supply chain efficiency, effectiveness and innovation. GHSC-PSM seeks to leverage this industry best practice to reduce costs and increase efficiencies in global and national supply chains in order to reach more people and save more lives.

The evolution from implementing the standards in IT systems to implementing them in business processes is a methodical process involving business process analysis and supply chain metrics. The effort involves reviewing business processes in light of the new standards and technical capabilities (e.g., AIDC; electronic transactions; etc.) to identify opportunities to optimize supply chain information across business processes to fuel operational efficiencies and process improvements. GHSC-PSM collects various supply chain metrics to help them explore standards-based industry innovations that can lead to a better, more efficient supply chain. The goal is to strengthen supply-chain processes from procurement to storage to delivery in order to reduce costs, improve efficiency, and improve the availability of health commodities worldwide.

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