The Global Language of Business

GS1 Healthcare US®

Getting Started with the GS1 Global Data Synchronization Network™ (GDSN®)

Release 1.0, December 18, 2019

Table of Contents

About GS1

GS1® is a neutral, not-for-profit, global organization that develops and maintains the most widely-used supply chain standards system in the world. GS1 Standards improve the efficiency, safety, and visibility of supply chains across multiple sectors. With local Member Organizations in over 110 countries, GS1 engages with communities of trading partners, industry organizations, governments, and technology providers to understand and respond to their business needs through the adoption and implementation of global standards. GS1 is driven by over a million user companies, which execute more than six billion transactions daily in 150 countries using GS1 Standards.

About GS1 US

GS1 US®, a member of GS1 global, is a not-for-profit information standards organization that facilitates industry collaboration to help improve supply chain visibility and efficiency through the use of GS1 Standards, the most widely-used supply chain standards system in the world. Nearly 300,000 businesses in 25 industries rely on GS1 US for trading-partner collaboration that optimizes their supply chains, drives cost performance and revenue growth while also enabling regulatory compliance. They achieve these benefits through solutions based on GS1 global unique numbering and identification systems, barcodes, Electronic Product Code (EPC®)-based RFID, data synchronization, and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®).

About GS1 Healthcare

GS1 Healthcare is a global, voluntary healthcare user group developing global standards for the healthcare supply chain and advancing global harmonization. GS1 Healthcare consists of participants from all stakeholders of the healthcare supply chain: manufacturers, wholesalers, and distributors, as well as hospitals and pharmacy retailers. GS1 Healthcare also maintains close contacts with regulatory agencies and trade organizations worldwide. GS1 Healthcare drives the development of GS1 Standards and solutions to meet the needs of the global healthcare industry and promotes the effective utilization and implementation of global standards in the healthcare industry through local support initiatives like GS1 Healthcare US® in the United States.

About GS1 Healthcare US

GS1 Healthcare US® is an industry group that focuses on driving the adoption and implementation of GS1 Standards in the healthcare industry in the United States to help improve patient safety and supply chain efficiency. GS1 Healthcare US brings together members from all segments of the healthcare industry to address the supply chain issues that most impact healthcare in the United States. Facilitated by GS1 US, GS1 Healthcare US is one of over 30 local GS1 Healthcare user groups around the world that supports the adoption and implementation of global standards developed by GS1.

1 Introduction

In general, the healthcare industry is a three-tiered supply chain consisting of the manufacturer, often a distributor, and a provider. For certain healthcare products there is also a more direct manufacturer to provider channel. Within that basic model, each company often has many systems that use and rely on product information to support core supply chain activity, including procurement, inventory, distribution, billing/accounts payable, etc. Global regulations for unique device identification of medical devices and secure supply chain traceability of pharmaceutical drugs may also drive the need for trusted product information. Information about products used in patient care is now being directly connected to Electronic Health Records (EHRs) in support of healthcare portability and patient safety. In today's more web-based world, both healthcare providers and patients have come to expect easy access to information about the products they use and buy. Additionally, as the value of data increases, ancillary healthcare organizations and business teams, such as solution providers, regulators, marketing, e-commerce, retailers, and Health Information Exchanges are becoming increasingly interested in access to consistent, accurate and timely data about healthcare products.

It has been challenging for healthcare companies to ensure that the product information being used in one system and by one trading partner is the same as the information being used in/by another. The GS1 Global Data Synchronization Network™ (GDSN)® can help healthcare companies address this problem. Additionally, GDSN supports thousands of data elements about trade items and it can serve as a single source for all types of data needs – supply chain, storage and handling, regulatory, e-commerce, etc.

> **Note**: As with all GS1 Standards and solutions, this Guideline is voluntary, not mandatory. It should be noted that use of the words "must," "should," and "require" throughout this document relate exclusively to technical recommendations for the proper application of the standards to support the integrity of your implementation. The information contained herein is for informational purposes only as a convenience, and is not legal advice or a substitute for legal counsel. GS1 US Inc. assumes no liability for the use or interpretation of the information contained herein.

2 Document Information

2.1 Purpose of this Document

The purpose of this document is to provide a high-level resource to help healthcare organizations jumpstart their GDSN implementation efforts. To that end, this document outlines the key tasks that most companies will find necessary for a successful implementation, shares learnings, and explains the recommended processes established by other companies in their deployment of the GDSN. To address the importance of data quality, which was identified as a key barrier to GDSN implementation by healthcare organizations, this document also includes key data quality best practices. The guidance referenced regarding data governance processes have been established by the GS1 US National Data Quality Program and are highlighted in the Data Quality section of this document.

2.2 Who Should Use this Document?

This document is intended for use by any member of the healthcare industry supply chain, including manufacturers, distributors, wholesalers, and providers. It may also benefit a variety of ancillary healthcare players, such as solution providers, regulators, marketing, e-commerce and health information exchanges, who have a keen interest in the data about medical products. It is applicable to all healthcare product categories, including medical devices, pharmaceuticals, and other products used in a typical healthcare setting, such as dietary or nutritional.

2.3 Roles Terminology

In referencing various parties, this document and the resource materials noted throughout use terminology related to supply chain roles, as well as terminology related to a party's role in the GDSN. To promote clarity, the tables below define the terminology used for supply chain roles as well as GDSN roles.

Table 2-1 Healthcare Supply Chain Roles Terminology

Role	Description
Manufacturer	Party that produces medical device or pharmaceutical products.
Distributor	Company that delivers medical device or pharmaceutical products to locations, such as hospitals, institutions, nursing homes, etc. Intermediary between manufacturers and healthcare providers. (aka a Wholesaler in pharmaceutical channel)
Provider	Hospitals, institutions, and pharmacy or retail drug companies responsible for providing healthcare or dispensing drugs and medical devices to patients. (aka a Dispenser in pharmaceutical channel)
Brand Owner	Organization that owns the specifications of the trade item, regardless of where and by whom it is manufactured. This is the trading partner responsible for the integrity of the brand name. This is usually the Manufacturer, but may be the Distributor or private label/OEM manufacturer. ■ Best Practice is that the Brand Owner has its own GS1 Company Prefix, and assigns Global Trade Item Numbers (GTINs) under that prefix to the product(s) it owns or manages.

Table 2-2 GDSN Roles Terminology

Role	Description
Data Pool	A repository of data where trading partners can obtain, maintain, validate and exchange product information in a standard format through electronic means.
GS1 Global Registry®	A directory for the registration of unique catalogue items and parties. It contains a limited data set and acts as a pointer to Source Data Pools where master data is housed. It also fulfils the role of matching subscriptions to registrations to facilitate the synchronization process.
Data Source	The entity that provides the GDSN with master data. The Data Source is the owner of this data and is responsible for updating it. The Data Source is typically a manufacturer or a distributor. The Data Source defines the trade item information and sends it to their Data Pool to be registered with the GS1 Global Registry. Through its data pool, the Data Source manages subscriptions and shares data with Data Recipients. The Data Source can publish their information either to specific supply chain partners or to an entire target market.
Source Data Pool (SDP)	A Source Data Pool is a data pool that is linked to a Data Source. It provides validation services to assure that the data entering the GDSN is standards-compliant. It collects trade item information from Data Sources to be registered with the GS1 Global Registry and uses standard GS1 XML Messages to register the catalogue item information with the GS1 Global Registry. It also uses standard GS1 XML Messages to exchange item information with Recipient Data Pools.
Data Recipient	A party which is authorized to view, use, and download a set of master data provided by a Data Source. A Data Recipient is typically a provider or a distributor but can also be any entity with a need to access and use data related to products. The Data Recipient requests subscription to trade item information to the GS1 Global Registry through their Data Pool. The Data Recipient receives any updates to trade items published to them.
Recipient Data Pool (RDP)	A Recipient Data Pool is a data pool that is linked to a Data Recipient. It notifies the GS1 Global Registry when its customer (a data recipient) wants to subscribe to trade item information. The Recipient Data Pool also receives new and updated trade item information from Source Data Pools and forwards it to the Data Recipient.

3 Introduction to the Global Data Synchronization Network

The GDSN is a network of interoperable data pools and a global registry, GS1 Global Registry® that enable companies around the globe to exchange Standardized product data with their trading partners.

The GDSN allows trading partners to share the latest information in their systems. Any changes made to one company's database can be automatically and immediately provided to all of the other companies who subscribe to the data.

With this high level design, the GDSN offers a standards-based approach to:

- Storing item information
- Validating that the information is properly defined and formatted
- Keeping that information up-to-date

3.1 The Foundation for GDSN Synchronization: GTINs, Attributes and GLNs

The GDSN uses GS1 identification and data standards as the common language for product information. For identification, the GDSN uses the Global Trade Item Number® (GTIN®) for products and the Global Location Number (GLN) for supply chain parties and locations.

GTINs: Brand owners assign GTINs to all of their products, and define the master data ("attributes") to be associated with that product GTIN (e.g., size, color, brand information, etc.). GDSN standards define the available attributes, as well as the specific format for attribute data.

GLNs: The GDSN uses GLNs to identify parties in the network. GDSN participants need to assign at least one GLN to identify themselves in the network. Trading partners assign GLNs to their own locations and entities based on GS1 Standards.

> ✅ **Note**: Currently in the U.S., GLNs are assigned to most healthcare providers by the Group Purchasing Organizations (GPOs). GPOs perform the initial GLN enumeration on behalf of their provider members. Their intention is for providers to take over responsibility for enumerating their other locations and managing their own hierarchies and location information. There are clear benefits when healthcare providers take ownership of their hierarchies, including timeliness of updates, hierarchies that more closely align with an organization's supply chain and process-based structure, and data quality.

With these foundational elements in place, GTINs and their associated attributes can be stored in a GDSN-certified data pool and shared with authorized supply chain partners via the GDSN.

3.2 Components of the GDSN

3.2.1 GDSN-certified Data Pools

GDSN-certified data pools serve as standards-based repositories for item information. Certification assures that all data pools in the network are consistent and employ a common basic set of validation rules that support data integrity in the network. GDSN-certified data pools store supply chain information and provide users with a single point of entry for accessing the GDSN. (Please refer to the _GS1 GDSN website_ for a full list of GDSN-certified data pools.) It should be emphasized that data pools are not specific to one type of supply chain partner or role (e.g., manufacturer, distributor, operator,

provider, supplier, buyer, etc.). In fact, GDSN-certified data pools can be utilized by trading partners to share and to also receive product data.

3.2.2 GS1 Global Registry

The GS1 Global Registry is the GDSN's source and recipient directory that:

- Provides validation services to ensure uniqueness
- Enables the registration and distribution of party information, identifying the source and the recipient
- Enables the registration of all product information through a small set of core information
  - o GTIN, GLN of the information provider, Target Market and the Global Product Code
- Performs the item/subscription matching process
- Enables data pool interoperability

Manufacturers, distributors, providers or other entities wishing to share data with trading partners access the GS1 Global Registry through their GDSN-certified data pool. No other access point to the GS1 Global Registry is needed.

Table 3-1 Components of the GDSN

GDSN Component	Description
GDSN-certified Data Pools	■ GDSN-certified Data Pools are warehouses for GTIN information. They store supply chain information and provide users with a single point of entry for accessing the GDSN. ■ In addition to storing information, GDSN-certified Data Pools also validate information to insure that it is properly defined and formatted, as well as manage the on-going communication of information among trading partners. ■ GDSN-certified Data Pools are independent organizations that provide various services of which GDSN utilization is one. Refer to *How to Select a GDSN-certified Data Pool* for more information.
GS1 Global Registry	■ The GS1 Global Registry maintains the data pool location of each GTIN in the GDSN. This is how the GDSN knows where GTIN information can be found. ■ By maintaining the data pool location of each GTIN in the GDSN, the GS1 Global Registry serves as the "trading partner directory" for the GDSN so that everyone can be connected regardless of where their information is stored.

3.3   How Does the GDSN Work?

There are five basic steps involved the GDSN data synchronization process:

1. **Load Data**: The seller or brand owner loads GTIN product information into its data pool (i.e., the Source Data Pool).

2. **Register Data**: The Source Data Pool sends a small subset of this data to the GS1 Global Registry.

3. **Request Subscription**: The data recipient, through its own data pool (i.e., the Recipient Data Pool), subscribes to receive a brand owner's product information.

4. **Publish Data**: The brand owner's data pool publishes the requested product information to the data recipient's data pool.

5. **Confirm & Inform**: The data recipient sends a confirmation to the seller via each company's data pool, which informs the brand owner of the action taken by the data recipient using the information.

Figure 3-1 GDSN Data Flow

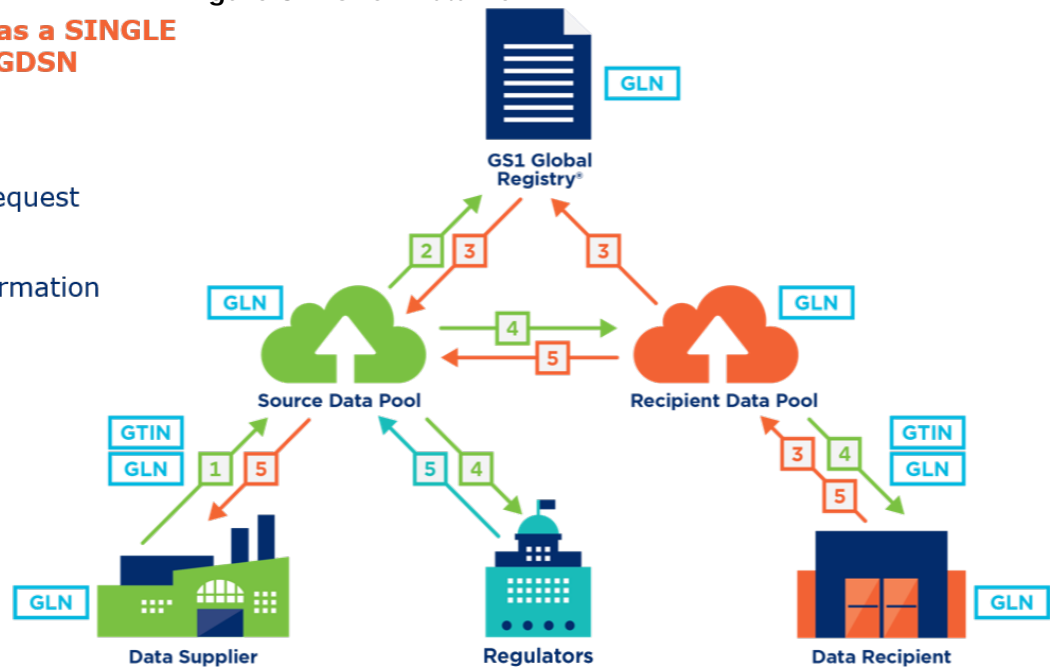**Select one data pool as a SINGLE point of entry to the GDSN**

Step 1: Load Data

Step 2: Register Data

Step 3: Subscription Request

Step 4: Publish Data

Step 5: Recipient Confirmation

3.4 Value of Data Synchronization for Healthcare Industry

Healthcare manufacturers and providers have many systems that they use and rely on for product information, including sales and marketing, inventory replenishment, distribution, billing/accounts payable, contracts and chargebacks, barcode tracking and scanning, electronic health records, traceability, etc. Unfortunately, there is often no central, authoritative database to house and manage all of that information. Instead, each system generally uses its own database. As a result, there is no method for assuring that the information about products being used in one system is the same as the information being used in another. Moreover, whenever a trading partner updates or changes any of its product information, all of the disparate systems and databases that rely on that information must be updated individually. This is an unreliable and inefficient approach to data management that can increase costs for manufacturers, distributors and providers in the healthcare supply chain.

The GS1 GDSN can help healthcare organizations address this problem. The GDSN is the GS1 solution for sharing accurate product information within a company and across supply chains. With the GDSN, healthcare stakeholders can establish one, authoritative source of properly-formatted product information to feed all of their systems and share with their trading partners. In addition, the GDSN offers healthcare organizations a highly-efficient, automated process for keeping the information in that central source up-to-date and accurate.

The advantage of using the GDSN is that it offers healthcare supply chain members one point of connectivity (i.e., their GDSN-certified data pool), a common set of attributes, one common format, and a continuous, automated approach for keeping that data up-to-date.

- **Reliable Data:** The GDSN promotes reliable data through the use of authoritative data sources that help ensure that product information is identical across IT systems and among trading partners.

- **Quality Data:** The GDSN enhances the quality of supply chain information by validating that the information is properly defined and formatted per GS1 Standards.

- **Current Data:** The GDSN utilizes a real-time, continuous approach to data synchronization that keeps data current and up-to-date.

- **Ease of Use:** Using an automated approach to data synchronization, the GDSN converts the complex and burdensome task of managing product information into a simple, efficient, behind-the-scenes process.

- **One Collaborative Network:** The GDSN is unique in that it allows all trading partners to work together using one set of standards and one network even if they are using different data pools.

3.5 Analyzing the GDSN ROI for Your Individual Company

The GDSN offers healthcare companies a highly efficient automated process for keeping product information reliable, properly formatted, and up-to-date. This lays the foundation for improved data quality, traceability, efficiency and effectiveness to help drive costs out of the supply chain and enhance patient safety. The corresponding value and return on investment (ROI) can be demonstrated in various areas, including:

- Enhanced customer satisfaction and patient safety

- Increased business process efficiencies

- Reduced waste

- Improved inventory tracking

- Expedited recalls

- Regulatory requirements management

- Item Master management

- Financial management processes (i.e. Reimbursements, Billing, Inventory)

- Efficient sharing and access to trusted data (Accurate, Complete, Consistent, Timely)

As with any important project, trading partners should establish a return on investment (ROI) for the use of GDSN. Indeed, demonstration of positive ROI for GDSN supports companies challenged daily by the allocation of scarce resources. This section provides guidance to help each trading partner determine its own return on investment based on individual needs and circumstances. It is intended as a starting point for any company wishing to pursue ROI analysis.

In order to support your ROI analysis, a list of healthcare metrics for GDSN ROI is provided below. Begin your ROI analysis by determining the amount of staff time and resources currently allocated to each of these functions. In addition, determine the amount of manual error corrections being done in each function. The potential areas for ROI are applicable to all healthcare stakeholder roles (i.e., suppliers, distributors, providers, patients, etc.).

Note: Remember that some of the benefits associated with timely, accurate data may be more difficult to tangibly value but should not be overlooked when defining ROI.

Table 3-2 Healthcare Metrics for GDSN ROI[1]

Functional Area	Metric
Logistics & Distribution	■ Recall Management ■ New Item Set Up & Introduction ■ Speed to Market ■ Logistics Expenses including optimized transportation ■ Warehouse Expenses and Productivity including space optimization ■ Product Delivery Issues to Recipient ■ Order Can Not Fit on Truck (Cube or weight too high) ■ Warehouse picking & Shipping Errors ■ Inventory Management (Excess and Stock Outs) ■ Unit of Measure issues
Labor Management	■ Time Spent Addressing Item Data Issues with Customers (Sales) ■ Productivity within Order & Item Administration (Order Administration) ■ Adjustments and Reconciliation (Accounting Administration)
Order Administration & Accounting	■ Order Accuracy Issues ■ Invoice Errors ■ Incorrect or Inaccurate Orders Placed (Delays) ■ Reconciliations ■ Deductions and Charge-Backs reconciliation

4   GDSN and the Healthcare Industry

4.1   Healthcare Attributes

Gaining a full and comprehensive understanding of the attributes and how they will be utilized is key to a successful implementation. One of the first steps to be taken in implementation is to focus on educating your project team about the attributes. With that understanding, the project team should evaluate where those attributes are stored and used internally.

Performing a gap analysis will help you understand the scope of work to be completed to support implementation. As you review the attributes and their usage, it is important that data sources take the steps necessary to validate data accuracy. Packaging strings, dimensions and weights are key attributes to be validated for accuracy. It is also important that data recipients identify those attributes that may need to be reviewed and updated before loading into internal systems.

The GS1 Healthcare US Initiative members developed a list of GDSN attributes to address the needs of the healthcare industry. You can download a recommended list of GDSN Attributes for Healthcare in *Creating the Case for Trusted Data*. (Also, see Appendix A for the Attribute List)

In addition, you can also use *GS1 Global Attribute Explorer*, an intuitive, browser-based tool, to search and discover GDSN attribute standards, including GS1 Global Data Dictionary (GDD) definition, metadata, etc. Your GDSN-certified data pool can further explain GS1 Standards requirements for populating the different attributes using their tools and systems.

4.2   Attribute Variations

Within the GDSN, the combination of three key elements (GTIN of the trade item, GLN of the information provider, and Target Market) are used to identify a unique set of values for GTIN attributes.

---

[1] *Synchronization - The Next Generation of Business Partnering: How Leading Companies are Delivering Actual Results.* Grocery Suppliers Association (GMA), Food Marketing Institute (FMI), Wegmans Food Markets, Accenture LLP and 1SYNC. © Copyright 2006.

This enables data sources to vary GTIN attribute values depending on information provider GLN and/or Target Market, and thereby control which attributes/value are communicated to data recipients.

When creating Target Market variations of a GTIN or an information provider instance of a GTIN, there are certain attribute values that should be consistent across every variation in order to promote data integrity to the network and trading partners.

4.3   GDSN Roles in Healthcare

The effort to implement GDSN varies depending on if you are a *data source* or a *data recipient*. A *data source* is the sender of the product attributes and is responsible for the accuracy of the attributes. A *data recipient* is a receiver of the product attributes and is responsible for the distribution of that information to its internal and external systems.

In the healthcare supply chain, a data recipient may also be a data source. For example, a healthcare distributor may be a data recipient of product information from manufacturers, and they may also be a data source to their downstream trading partners if they need to share additional or updated attributes. Likewise, a healthcare manufacturer may need to receive and use the item information provided by a brand owner, and thus operate as a data recipient in that scenario. Therefore, GDSN implementation efforts can also vary depending on your supply chain role. It is important that you understand your organization's role and requirements before implementing.
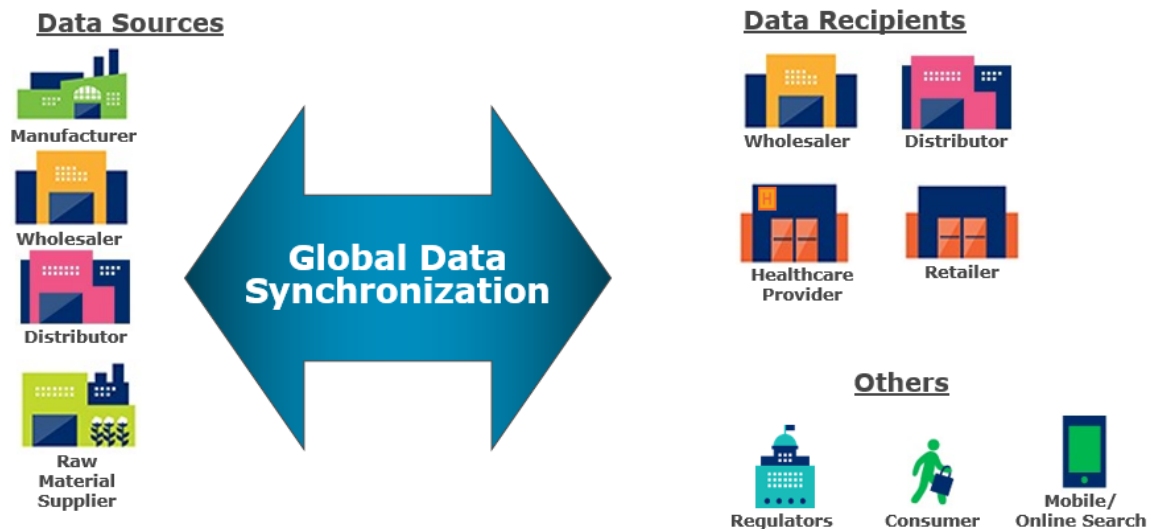
4.4   Private Label and Commodity (Packer) Label Products

Data synchronization helps companies to exchange and manage static product information (i.e., master data). In today's commerce, healthcare trading partners also depend on a certain amount of dynamic product information to conduct business. For example, there are certain product categories that are procured and sold today where the manufacturer of the product may vary depending on the decision to purchase. This occurs predominately with *private label products* and *commodity (packer) label products*.

- *Private label products* are defined as those products where the brand does not belong to the manufacturer.

- *Commodity or packer label products* are those generic products where the product specification is the same, and a Brand Owner purchases product based on that specification from multiple

manufacturers (who assign their own GTIN to their product). In these instances, the Brand Owner usually assigns one item code to be used when selling these products to downstream trading partners. Although the Brand Owner sells these products to end users under the same item code, there may be multiple manufacturer GTINs associated with the single Brand Owner item code.

In these scenarios, the manufacturer name may be different from time to time. Therefore, this information is usually made available through transactional data exchanged between the Brand Owner and end user based on the business requirements of the trading partners. Implementation of the GDSN need not affect this arrangement. Trading partners can continue using the same transactional documents to communicate the manufacturer name for product received by the end user. GS1 US provides the following guidance for how to manage manufacturer GLN and name attributes in the GDSN for these two product categories:

- The Brand Owner should make the decision on how to populate these attributes. Options include listing any and all physical manufacturers or listing the Brand Owner as the manufacturer.

- The manufacturer is the organization which is responsible for the manufacturing process whether they actually produce the product or not. This party controls the specifications for the product. This field can be repeated as necessary in conjunction with the name of manufacturer.

Based on this guidance, the attribute for manufacturer name may not be a static attribute for these two business scenarios.

5   General Guidance for Implementing GDSN

Implementing GDSN is not just a technology project. It is a business process change. It is important that you understand your organization's role and requirements before implementing. Timelines to complete your implementation may vary depending on your role within the supply chain and the complexity of your product categories. Nonetheless, laying a solid foundation and using a focused, phased approach to implementation are essential to successful deployment.

The effort to implement GDSN varies depending on if you are a data source or a data recipient. Therefore, this document provides a separate implementation section for each role (i.e., GDSN Implementation for a Data Source and GDSN Implementation for a Data Recipient). Each section provides step-by-step guidance for implementing the GDSN. Key efforts include building organizational readiness, preparing systems for GDSN attributes, and building business processes to support data synchronization.

In order to begin using the GDSN, data sources will need to have GTINs assigned to their products and GLNs assigned to their publishing locations, and data recipients will need GLNs assigned to their subscription locations. If your company has already assigned or begun to assign GTINs to its products, it is already well on its way to implementing the GDSN. It is also possible that a division of your company as a data source is already utilizing the GDSN, particularly if it sells some of its products to large retailers and/or retail pharmacies or manufactures non-healthcare related products that are provided in other consumer areas. Similarly, as a data recipient, it is quite possible that other areas of your organization are utilizing GDSN for products such as foodservice or janitorial supplies. If this is the case, then much of the work necessary to begin using the GDSN may have already been completed. Therefore, it is important to investigate whether the GDSN has been implemented anywhere in your company prior to commencing the implementation steps in the following chapters. The experience and expertise you might garner from these other departments within your organization could greatly expedite your start up.

The order in which implementation steps are presented in each chapter is a recommendation. However, each company's implementation will be unique to its needs, and the preferable order for individual organizations may differ. For example, manufacturers that are already using GDSN for their retail customers may already have executive sponsorship and a GDSN-certified data pool, and may be able to start their healthcare implementation with the data readiness and attribute population steps. Moreover, manufacturers with multiple and unrelated Enterprise Resource Planning (ERP) systems may want to drive implementation at the division level, requiring executive leadership at multiple levels with multiple

tracks to overall implementation. Thus, the order in which the implementation steps are presented in the following chapters should be used as a guideline.

6 GDSN Implementation for a Data Source

What exactly does it take to begin using the GDSN in your company as a data source? What are the steps and who is involved? This section provides insight for these questions with step-by-step guidance for implementing the GDSN. These steps include essential efforts like establishing executive support, forming cross-functional teams, developing an implementation plan, assessing data quality and systems requirements, creating internal and external communication strategies, engaging trading partners, and establishing standard operating procedures.

6.1 Build Organizational Readiness

Success factors for building organizational readiness and preparing for a successful implementation are identified in the table below.

Table 8-1 Building Organizational Readiness

Success Factor	Tasks
Support and Engagement	▪ Engage a visible and supportive executive sponsor ▪ Engage with a Certified Data Pool who can also assist with direction on establishing organizational readiness ▪ Assess the benefits of joining the GS1 Healthcare US Initiative and specific workgroups engaged in GDSN adoption to aid in the implementation process ▪ Benchmark and network to learn from others
Education and Benchmarking	▪ Leverage implementation resources available on the GS1 Healthcare US website ▪ Attend GS1 US University courses and industry webinars ▪ Encourage representatives to participate in on-going Initiative meetings
Networking and Sharing Lessons Learned	▪ Attend GS1 US Initiative meetings ▪ Join a GDSN working group ▪ Participate in the GS1 Connect® conference ▪ Identify and engage with industry "thought leaders" in a mentor/mentee capacity
Communication	▪ Create internal and external communication plans that share project status and timelines ▪ Develop FAQ tools to assist with internal and external inquiries

Scope of Implementation and Business Impact	▪ Understand your internal data quality management process
	  ▪ Perform sample audit for data accuracy and consistency with GDSN formatting
	  ▪ Validate data accuracy management process (for post-synchronization dispute resolution)
	  ▪ Cleanse attributes as needed
	▪ Understand your internal data publication capabilities and requirements relative to your trading partner requirements (e.g., publication of full catalog versus publication of products sold)
	▪ Identify New Product Introduction and item change management process and all business implications (e.g., logistics, features and benefits, nutritionals, marketing, sales, etc.)

6.2   Build Your Team

- Form a cross-functional team specific to your organizational make-up, including members from the areas most impacted by implementation such as those with responsibility for the following activities:

  - □ Supply Chain
  - □ Information Technology
  - □ Quality Assurance
  - □ Operations
  - □ Product Management
  - □ Sales/Sales Operations
  - □ Customer Service

  - □ Legal/Public Relations
  - □ Specs & Labeling
  - □ R & D, Packaging, and Product Development
  - □ E-Commerce and Marketing
  - □ Data Governance data owners & stewards

- Define roles and responsibilities for the Executive Sponsor, project team, and process owners to include a data owner/data steward from a data governance perspective for required product content.

6.3   Build Your Implementation Plan

- Perform readiness assessment and develop an implementation plan incorporating the key efforts identified throughout this chapter.

- Identify through metrics and measures focal areas of opportunity. Develop baseline metrics so that improvement post data sharing implementation can be measured and captures. Consider metrics around reduction of errors, FTEs, time/cost savings, etc.)

- Resources may include GS1 US, GDSN-certified data pools, and/or solution providers.

- Key actions to consider when developing the implementation plan:

  - □ Define milestones like determining alignment, resources, timing, etc.
  - □ Review GS1 Healthcare US educational documents and webinars.
  - □ Review GS1 US implementation Toolkits:

    - ▪ *GS1 Healthcare US GTIN Supplier Toolkit*
    - ▪ *GS1 Healthcare US GTIN Provider Toolkit*
    - ▪ *GS1 Healthcare US GLN Supplier Toolkit*
    - ▪ *GS1 Healthcare US GLN Provider Toolkit*
    - ▪ *GS1 Healthcare US GDSN Supplier Toolkit*
    - ▪ *GS1 Healthcare US GDSN Provider Toolkit*

6.4   Build Systems to Support Data Synchronization

6.4.1   Assess GTIN Readiness

- Your databases may already contain many GTINs; however, at this point you will need to verify that they are correctly formatted and accurately assigned. Therefore, coordinate with your company's internal supply chain master data team to gather all of the GTINs for your products.

- Assess the GTINs you may already have allocated for misalignment, and then determine if there are any omissions or additional GTINs that need to be allocated.

- When reviewing your current GTIN assignments, it is recommended that you compare the GS1 Company Prefix utilized in the GTIN to the GS1 Company Prefix licensed to the brand owner to ensure accuracy. For more information please see our website for FAQs regarding GS1 Company Prefix Management and Mergers & Acquisitions

- Clearly define your organization's GTIN product hierarchy and packaging levels. This is a critical step in the implementation process.
  - Recognize the levels of the product hierarchy (i.e., packaging levels) that your GTIN numbering system needs to accommodate to support operations and trading partners. Be sure to consider regulatory, clinical use, and chargeback processes as they apply to your company's products.

- Confirm that all products and needed packaging levels have been assigned a GTIN, and that each GTIN has been properly assigned using the correct GS1 Company Prefix.

- All available GTIN product attributes should be identified, properly defined and data structure documented by the brand owner. Agreement on data element definitions between trading partners (i.e. synchronizing/reconciling) is an important element of successful data sharing. This reconciliation activity should be part of an onboarding process with new trading partners.

- Conduct random sample testing to validate that currently-assigned GTINs match what is on the corresponding item label and/or barcode.

- Coordinate with your trading partners to verify a successful match of GTIN to current item identification codes.

6.4.2 Select Your GDSN-certified Data Pool

- Consult GS1 US resources about GDSN-certified data pools

- Select a GDSN-certified data pool and work with the data pool to prepare and on-board your GTIN information. Note that all GDSN-certified data pools have access to the same information in the GDSN and are all able to communicate with each other. Therefore, it is NOT necessary to choose the same data pool as any particular trading partner.

- Have your IT team evaluate the various technological options for loading data into the data pool.

- Select which GLN you want to use for publishing. This will be the level at which you will register your GTINs within the GS1 Global Registry. It is also the level at which your trading partners will submit their requests for subscription.
  - It is recommended to review your current GLN assignments and identify your strategy for publishing. Some data sources publish at the corporate GLN while others may elect to publish at the brand level.

6.4.3 Prepare Your Systems for GDSN Attributes

- Use the GS1 Healthcare US Attribute Resources (which include industry definitions and examples) to learn about GDSN healthcare attributes and how to define them.
  - Resources include:
    - *Creating the Case for Trusted Data* (or see the attribute list in Appendix A of this document)
    - *GS1 Global Attribute Explorer*
    - *GS1 US Guidance for Sharing Product Attributes via GDSN* (The document was created by Foodservice GS1 US initiative members but contains relevant cross-industry details and guidance for sharing attributes via GDSN.)

- □ If needed, your GDSN-certified data pool may be able to provide additional support and guidance for GTIN and GLN assignment processes including the creation and maintenance of attributes.

- □ GS1 US and the Healthcare industry recommend that the 39 attributes defined in *Creating the Case for Trusted Data* be considered as a core set of minimum attributes to be shared with all healthcare data recipients. Not all trading partners require every healthcare product attribute. The universe of attributes you need to define for your products includes the core set of attributes plus any other attributes required by your trading partner or data recipients. Trading partners often post their attribute requirements on their data pool's website, and/or GS1 Global Attribute Explorer.

- ■ Identify your source databases/tables for GDSN attributes. Develop your mapping plan to pull data from the system of record as opposed to a system of reference.

- ■ Perform data analysis to assess and baseline existing data, compare GDSN requirements to internal data elements to verify alignment, and analyze data output for accuracy and consistency.

- ■ If the data gap analysis uncovers missing attributes, your data pool/solution provider may be able to assist in finding a solution. For example, they may be able to aid in identifying attributes that can be derived rather than creating additional fields.

- ■ Provide feedback to internal teams and adjust as necessary.

6.5 Build Business Processes to Support Data Synchronization

6.5.1 Implement Data Quality Measures

- ■ Implementation of data quality measures typically requires close coordination with your company's supply chain master data team.

- ■ Decide on overall GDSN accountability within your organization (e.g., Who owns the data? Who is responsible for physically updating the data?)

    - □ Establish and clearly communicate the process and controls for entering and updating data.

    - □ Allowing too many people access to data change capabilities can cause confusion and errors.

- ■ Define data governance processes to maintain the GTIN and GDSN attribute definitions and quality you established with your trading partners in preparation for GDSN implementation (see above), and to verify that all products are assigned a GTIN and all data/attributes are properly defined going forward.

- ■ Leverage the data quality tools and resources available from the *GS1 US National Data Quality Program*.

- ■ Develop scorecards for tracking progress and establish a process to maintain data quality and identify those responsible for maintaining this process. Consider leveraging the *GS1 US Foodservice Data Quality Scorecard*.

6.5.2 Conduct a GDSN Pilot and/or Testing with Trading Partners

- ■ At this point, you are ready to conduct tests with your customers. The testing process will provide validation of information system capabilities and operational impact.

    - o Make sure that GLNs that will serve as the location/customer identifier have been properly established and communicated.

    - o Make sure any contractual requirements regarding data sharing between trading partners and Data Pools have been completed.

- Consult with your GDSN-certified data pool for its recommended testing criteria and procedures.
    - In addition, follow your normal testing protocol/practices for the introduction of new technologies between partners.
- A phased or incremental approach to loading, publishing and synchronizing data with customers is recommended during testing.
- Aim to successfully exchange data with customers using the GDSN (i.e., have customers subscribe to several of your GTINs). These tests should also include the response messaging associated with GDSN. GS1 US recommends starting with a small subset of your traded product file and not your full product portfolio in these initial testing efforts.
- Document and discuss critical success factors or lessons learned.
- Make adjustments as necessary to your implementation plans.

6.5.3   Develop Formal Standard Operating Procedures

- Determine process owners
- Provide training
- Establish on-going governance and maintenance
- Leverage the data quality tools and resources available from the _GS1 US National Data Quality Program_

7   GDSN Implementation for a Data Recipient

What exactly does it take to begin using the GDSN in your company as a data recipient? What are the steps and who is involved? This section provides insight for these questions with step-by-step guidance for implementing the GDSN. These steps involve essential efforts such as establishing executive support, forming cross-functional teams, creating internal and external communication strategies, initiating customer and supplier involvement, establishing standard operating procedures, and achieving your business case objectives.

7.1   Build Organizational Readiness

Success factors for building organizational readiness and preparing for a successful implementation are identified in the table below.

Table 7-1 Building Organizational Readiness

Success Factor	Tasks
Support and Engagement	- Engage a visible and supportive executive sponsor - Assess the benefits of joining the GS1 Healthcare US Initiative and especially those workgroup efforts focused on GDSN adoption and use to aid in the implementation process - Benchmark and network to learn from others
Education and Benchmarking	- Leverage implementation resources available on the _GS1 Healthcare US website_ - Attend _GS1 US events and webinars_ - Encourage representatives to participate in on-going GS1 Healthcare US meetings
Networking and Sharing Lessons Learned	- Attend Initiative meetings - Join a GDSN working group - Participate in the GS1 Connect conference
Communication	Create internal and external communication plans that share project status and timelines

	■ Develop FAQ tools to assist with internal and external inquiries
Scope of Implementation and Business Impact	■ Understand your internal data quality management process
	■ Identify all business implications (e.g., shipping, receiving, marketing, sales, etc.)

7.2 Build Your Team

■ Form a cross-functional team specific to your organizational make-up, including members from the areas most impacted by implementation such as those with responsibility for the following activities:

- □ Supply Chain
- □ Information Technology
- □ Quality Assurance
- □ Operations
- □ Product Management
- □ Sales/Sales Operations

- □ Customer Service
- □ Purchasing
- □ Legal/Public Relations
- □ E-Commerce and Marketing
- □ Data Governance (data owners & stewards)

■ Define roles and responsibilities for the Executive Sponsor, project team, and process owners to include a data owner/data steward from a data governance perspective for required product content

■ If there are any additional third party players involved as representatives for your organization (i.e. third party product management or IT organizations), these partners should also be included as part of your core team.

7.3 Build Your Implementation Plan

■ Perform readiness assessment and develop an implementation plan incorporating the key efforts identified throughout this chapter.
  - o You may want to confirm whether or not other areas of your organization already have a relationship with a certified Data Pool. It is not unusual for an area such as Food Service or Housekeeping within a Healthcare Provider organization to already be sharing master data with their food service/janitorial suppliers via GDSN.

■ Identify which of your data sources have adopted GS1 Standards and their readiness to participate in GDSN, identify a point person from those organizations and document contact information for those data sources.

■ Implementation should be based on a crawl – walk – run approach in order to build a solid foundation for future expansion of usage and additional attributes.

■ Resources may include GS1 US, GDSN-certified data pools, and/or solution providers.

■ Key actions to consider when developing the implementation plan:

- □ Define milestones like determining critical attributes by use case, alignment, resources, timing, etc.

- □ Review GS1 US *educational documents* and *webinars*.

- □ Review GS1 US implementation Toolkits:

  - ▪ *GS1 Healthcare US GTIN Supplier Toolkit*

  - ▪ *GS1 Healthcare US GTIN Provider Toolkit*

  - ▪ *GS1 Healthcare US GLN Supplier Toolkit*

  - ▪ *GS1 Healthcare US GLN Provider Toolkit*

  - ▪ *GS1 Healthcare US GDSN Supplier Toolkit*

- *GS1 Healthcare US GDSN Provider Toolkit*

7.4 Build Systems to Support Data Synchronization

7.4.1 Select Your GDSN-certified Data Pool

- Select a GDSN-certified data pool and work with the data pool to prepare for synchronization. Note that all GDSN-certified data pools have access to the same information in the GDSN and are all able to communicate with each other. Therefore, it is NOT necessary to choose the same data pool as any particular trading partner.

- Select which GLN you want to use for subscribing. Item information within the GDSN will be sent to the level of the GLN that a company uses for the subscription process. Accordingly, if you need item information to be sent to your corporate location, you should use a corporate GLN. If you need item information to be sent to your local or branch locations, you should use a GLN that is assigned to those locations. Coordinate with your company's internal item team.

- Your GDSN-certified data pool can provide guidance for your implementation plan, education, and project management.

- For more information on selecting a GDSN-certified data pool, please see the *GS1 US resources about GDSN-certified data pools*.

7.4.2 Define Your GDSN Attribute Requirements

- Generate a list of all of your suppliers. You may want to prioritize this list based on the number of products or usage volume each vendor supplies to your organization.

- Contact manufacturers, distributors, and/or suppliers for their GLNs, and to communicate your commitment to implement the GDSN to your supplier community.

- Work with your product team and your suppliers to identify all of the products used/purchased at your company from each supplier. All available GTIN product attributes should be identified, properly defined and data structure documented by the brand owner. Agreement on data element definitions between trading partners (i.e. synchronizing/reconciling) is an important element of successful data sharing. This reconciliation activity should be part of an onboarding process with new trading partners.

- Use this list as you work with your data pool to assure that you subscribe to all of those GTINs.

- Use the GS1 Healthcare US Attribute Resources (which include industry definitions and examples) to learn about GDSN healthcare attributes:

    - *Creating the Case for Trusted Data*

    - *GS1 Global Attribute Explorer*

    - *GS1 US Guidance for Sharing Product Attributes via GDSN* (The document above is a document created by the Foodservice initiative members but contains relevant cross-industry details and guidance for sharing attributes via GDSN.)

- Review your systems to identify all of the product data elements needed to support your business processes (e.g., purchasing, sales and marketing, replenishment, recall, e-business, rebates and chargebacks, inventory management, transportation, etc.).

    - This should produce a list of product data elements needed to drive your internal requirements and meet the needs of your trading partners.

- Identify the GDSN Healthcare attribute associated with each data element.

  - Map the GDSN attribute values/definitions to existing field names in your systems and databases. (If needed, your GDSN-certified data pool may be able to provide additional support and guidance.)

  - If an independent gap analysis uncovers missing data elements, your GDSN-certified data pool/solution provider may be able to assist in finding a solution. For example, they may be able to aid in identifying data elements that can be derived from existing attributes.

  - The end product should be the list of GDSN attributes you require from your data sources.

- Communicate your GDSN attribute requirements to your trading partners. (Data recipients often post their attribute requirements on their GDSN-certified data pool's website, and/or GS1 Global Attribute Explorer. Consult with your data pool for assistance.)

7.4.3   Prepare Your Systems to Integrate (for) GDSN Attributes

- Understand your internal needs. What data elements do you require? Where is the data element stored and managed? What internal systems must it be shared with to accommodate your organizational objectives?

- Establish a data storage strategy referencing the GTINs.

- A cross-reference between internal item numbers and GTINs is essential.

- Review and update any business processes and internal product data set-up processes that may need to change as a result of implementing data synchronization.

- Identify your source databases/tables for GDSN attributes. Develop your mapping plan to pull data from the system of record as opposed to a system of reference.

- Identify your destination databases/tables in your internal system.

- Develop your mapping plan to pull data from the system of record, as opposed to a system of reference, directly into internal business systems.

7.4.4   Note for Data Recipients Who Are Also Data Sources

Some data recipients also serve as data sources for some of their trading partners (i.e., distributors and companies that have private label or spec items, or need to change certain attribute values before publishing to downstream partners). The bullets below highlight key efforts for you as a data source. (Refer to the *data source chapter* for further guidance about the implementation effort for data sources.)

- Select which GLN you want to use for publishing. This will be the level at which you will register your GTINs within the GS1 Global Registry. It is also the level at which your trading partners will submit their requests for subscription.

- Identify those attributes that you may receive from your data sources, but that you would need to modify before publishing to your customers (if applicable).

- For any private label or spec items:

  - Assess GTIN readiness. Your databases may already contain many GTINs; however, at this point you will need to assure that they are correct and accurate, and then determine if there are any additional GTINs that need to be allocated. Conduct random sample testing to verify GTINs currently assigned match those reflected on the item label or barcode.

- Work with your data pool to register your GTIN information. As part of this effort, the IT team should evaluate the various technological options for loading data into a data pool, and then advise the team on their findings.

7.5   Build Business Processes to Support Data Synchronization

7.5.1   Implement Data Quality Measures

- Decide on overall GDSN accountability within your organization (e.g., Who owns the data? Who is responsible for physically updating the data?)

  - This can vary from organization to organization, but it is critical to establish accountability and information flow in order to implement successfully.

  - Groups involved in this process may include:

    - PIM
    - IT
    - Marketing
    - R&D

    - Logistics
    - Regulatory
    - Operations & Supply Chain
    - Cross-Functional Business teams
    - Master Data Management

- Establish and clearly communicate the process and controls for entering and updating data. Limit access to data and change or edit capabilities to reduce errors and prevent confusion.

- Define data governance processes to maintain the GTIN and GDSN attribute definitions and quality you established with your trading partners in preparation for GDSN implementation (see above), and to verify that all products are assigned a GTIN and all data/attributes are properly defined going forward.

- Leverage the data quality tools and resources available from the *GS1 US National Data Quality Program*.

- Develop scorecards or other measures for tracking and monitoring your company's internal progress, establish a process to maintain data quality and identify those responsible for maintaining this process. Consider leveraging the *GS1 US Foodservice Data Quality Scorecard*.

7.5.2   Conduct a GDSN Pilot and/or Testing with Data Sources

- At this point, you are ready to conduct tests with your individual trading partners. The testing process will provide validation of information system capabilities and operational impact.

  - Make sure that GLNs that will serve as the location/customer identifier have been properly established and communicated.

  - Make sure any documentation regarding data sharing between trading partners and Data Pools have been completed.

- Consult with your GDSN-certified data pool for its recommended testing criteria and procedures.

  - In addition, follow your normal testing protocol/practices for the introduction of new technologies between partners.

- A phased or incremental approach to synchronizing and confirming data with individual trading partners is recommended during testing. Aim to successfully exchange data with data sources using the GDSN.

- Send a request for subscription to your individual trading partner's GLN for several of their GTINs.

- Aim to successfully exchange data with suppliers using the GDSN (i.e., have suppliers publish several of your GTINs). These tests should also include the response messaging associated with GDSN. GS1 US recommends starting with a small subset of your traded products with a given supplier and not your full product portfolio in these initial testing efforts.

- Document critical success factors.

- Make adjustments as necessary to your implementation plans.

7.5.3 Develop Formal Standard Operating Procedures

- Determine process owners.

- Provide training.

- Establish on-going governance and maintenance.

- Leverage the data quality tools and resources available from the *GS1 US National Data Quality Program*.

8 Data Quality

Any data sharing project must start with data quality. Quality product information is not only essential to the efficient and effective operation of the healthcare supply chain but also critical to the safe and efficient provision of patient care. Care processes often involve the use or collection of product information that is increasingly being included in patient records. Quality, standardized data facilitates automated transactions such as procure to pay/order to cash or point of care data collection. This leads to reduced errors and fewer manual interventions lowering costs in the supply chain and allowing clinicians to focus on patient care. Quality data can facilitate faster and improved data analytics; in the supply chain this can lead to lower costs and more effective operations; in patient care the identification of care protocols that lead to improved outcomes and enhanced patient safety through improved ability to manage recalls, lot numbers, and product expirations. Conversely, sharing inaccurate or poor quality data only adds costs and, more importantly, risk to patients and healthcare institutions.

The Healthcare Transformation Group, a group of six healthcare systems that formed an action-oriented collaboration group to share best practices and drive needed positive change across the healthcare supply chain, has specified 7 characteristics of quality data:

- Trusted: for both source and context (native vs enabled data)

- Reliable: can be used appropriately in the manner defined

- Accessible: free and easy to attain for all customers (up and down stream)

- Accurate: the content of each data element is accurate for its intended use

- Complete: all the data elements expected are provided

- Timely: updated for the most current information as represented by the source's baseline (i.e. how the source views it throughout their operations)

- Relevant: aligned with expected use and will remain constant for the use intended[2]

Unfortunately, within the healthcare industry too many of these characteristics are not met consistently or vary depending upon data publisher or data source. GS1 US recognizes data quality as an industry issue in which all trading partners have a role to play. Manufacturers and distributers need to do their part by publishing quality data, data pools and other data sources to assure timely access to complete data, and data recipients need to be

---

[2] *Healthcare Transformation Group Presentation, 8th Annual HTG Summit, September 2018*

vigilant in maintaining data in their systems and providing timely feedback on data quality issues to data publishers and sources. Only by working together can the healthcare industry achieve the quality data relative to products that will enable it to realize the efficiencies and improvements in patient care and safety that technology can offer. In order to help industry stakeholders address the data quality issues that increase costs for manufacturers, distributors and providers, GS1 US believes industry needs a comprehensive approach to promote and maintain data quality and that such an approach should be employed by all trading partners wishing to use GDSN to share and consume product data.

> **Important:** GS1 US considers the 4 components of data quality outlined below critical to streamlined operations in the healthcare supply chain

Based on the work done in other industries, GS1 US has defined an industry-wide approach to data quality that leverages advancements in technology and the evolution of thought to promote and maintain data quality across an industry. There are 4 core components included in our recommended approach to quality data:

- GDSN: to electronically share high quality product data in a standardized way.

- GS1 US National Data Quality Program: to understand and implement best practices for data governance and product data management within your organization.

- Transparent Data Requirements: to communicate data needs and get on the same page with trading partners.

- Data Issue Reporting & Resolution Process (including scorecards): to formalize a collaborative process for how data quality issues should be managed between trading partners.

These 4 components are summarized in this section. *The GS1 US National Data Quality Playbook* is also a recommended resource for any organization to address the content acquisition (creation or sourcing) and data aggregation needs at specific stages in their data quality journey.

Benefits of Data Quality

- Cuts delays as a result of reduced errors impacting patient safety

- Increases customer satisfaction by ensuring the accuracy of key product information – including packaging strings (unit of measure), dimensions, hazmat, latex content or MRI compatible information. See *Creating the Case for Trusted Data* documentation for details on three key healthcare business use cases and the common attributes that support them.
  1. Strengthens trust and collaboration between trading partners
  2. Increases supply chain efficiencies and cuts costs by reducing errors
  3. Increases the reliability and efficiency of product transportation and delivery to warehouses and end user locations

8.1   GDSN

The GDSN provides a common set of attributes, one common format for those attributes, and one point of connectivity (i.e., their GDSN-certified data pool). The GDSN uses an efficient, automated approach to data-sharing to help align product information across IT systems and among trading partners, and to keep that information up-to-date.

> **Note**: The assumption is that the data shared through the GDSN is accurate, high quality data. To assure this is the case, healthcare companies should also implement the

other tools in this guide to promote and maintain high quality data, and resolve any data quality issues

Important: GS1 US considers use of the GDSN a core component for data quality.

8.1.1 Healthcare-Specific Guidance for Data Quality Leveraging GDSN

Data Sources:

- Before synchronizing through the GDSN, check with your trading partners to see if they have any additional steps or guidance you need to get started (e.g. Implementation Guides, Data Sync Supplier Information forms, etc.). (Note: Some data pools post their Data Recipient guides on their public websites. See the Transparent Data Requirements chapter below for more information.)

- Include contact information so your recipients can contact your company directly to resolve data sync issues (Catalog Item Confirmation (CIC) messages, etc.)

Data Recipients:

- If you identify incorrect data in your systems, and there is a need to manually correct, be sure to notify the data source to send a correction as well through the GDSN, to ensure all systems are updated and aligned. Data issues need to be resolved through the GDSN. If any issues arise, report the issue to the data source using the Data Issue Reporting & Resolution Process defined in this document. The data source can then resolve it and publish the corrected/updated information to you via GDSN. This ensures that other recipients of that same data will now have correct information as well.

- Include contact information so your suppliers (data sources) can contact your company directly to resolve data sync issues (Catalog Item Confirmation (CIC) messages, etc.)

- Manage CIC messages

8.2 The GS1 US National Data Quality Program

The *GS1 US National Data Quality Program* provides a comprehensive, cross-industry approach to data quality that organizations from any sector can adopt to promote the accuracy of product information received or retrieved by trading partners and consumers alike. This approach encompasses an overall program within an organization that includes institutional commitment to standards-based data, and processes to validate that consistent, complete and accurate information is being captured and utilized for both internal processes and external sharing.

The program focuses on three pillars of data quality (Each pillar is discussed individually below):

- Data Governance

- Education and Training

- Attribute Audits

Important: GS1 US considers the GS1 US National Data Quality Program a core component for data quality.

8.2.1   Data Governance

The first pillar in the GS1 US National Data Quality Program is data governance. Data governance formalizes accountability for data management across the organization and assures that the appropriate people are involved in the process. Data governance programs serve an important function within an enterprise: setting the parameters for data management and usage, creating processes for resolving data issues, and enabling business users to make decisions based on high quality data.

Data governance programs manage the actions, methods, timing and responsibilities for supporting master data within an organization. Whether you are a supplier sending data or a recipient receiving data, all parties must take ownership of the data they manage. A strong data governance program establishes processes and procedures to foster accurate, high-quality data and maintain it over time. It includes documented procedures that define all of the critical steps and handoff points for accountability.

8.2.1.1 Healthcare-specific Guidance for Data Quality Leveraging Data Governance

Data Sources:

- Implement formalized data governance programs pursuant to the GS1 US National Data Quality Program in order to promote data quality from the beginning.

Data Recipients:

- Implement formalized data governance programs pursuant to the GS1 US National Data Quality Program in order to promote data quality from the beginning.

- Verify that all systems across your organization that use and rely on information about products and trading partners use GDSN data to the extent that your data sharing and usage strategy requires. It is imperative that the GDSN is the authoritative source for all systems (e.g., sales and marketing, inventory replenishment and distribution systems, billing/accounts payable, barcode tracking and scanning systems, traceability systems such as point of care and other supply chain event tracking systems, performance reporting, etc.).

- Put policies and procedures in place to minimize the manual editing of the GDSN data in your systems. (GDSN data should only be updated via the GDSN.) If you identify incorrect data in your systems, and there is a need to manually correct the data, be sure to notify the data source to send a correction as well through the GDSN, to ensure all systems are updated and aligned.

- Establish a process by which data issues discovered in any system are reported to a designated group/person, and resolved through the GDSN and the Issue Reporting & Resolution Process defined in this document.

8.2.1.2 Key Resources

- GS1 US National Data Quality Program: Pillar 1 – *Data Governance Process Assessment Guide* (benchmarking your organization's processes and areas of opportunity)

- GS1 US National Data Quality Program: Pillar 1 – *Data Governance Best Practice Guidance*

8.2.2   Education & Training

The second pillar in the GS1 US National Data Quality Program is education and training. Formal education and training on GS1 Standards (including GTIN Management Rules, Package Measurement Rules, and the GDSN) promotes comprehension and proper application of the standards. This is essential to assure that your organization has the knowledge needed to maintain high quality data for your operations and your trading partners.

An organization should assure that all parties responsible for product data are part of an on-going education program so that resources remain current as internal data governance processes and personnel change, and as GS1 Standards evolve.

8.2.2.1 Healthcare-specific Guidance for Data Quality Leveraging Education & Training

- Key focus areas for education about GS1 Standards include:
  - GTIN Management Standard
  - Package Measurement Rules
  - GDSN
- Key focus areas for Healthcare-specific education include:
  - GS1 Healthcare US Initiative data attributes for GDSN
  - GDSN Messages (see Appendix B)
  - GDSN Message Flow (see Figure 3-1)
  - The Data Issue Reporting & Resolution Process defined in this document

8.2.2.2 Key Resources

- *GS1 GTIN Management Standard* (which form the basis on whether or not a new GTIN needs to be assigned based on changes to an existing product, promotions, or new product introduction)
- *GS1 Package Measurement Rules* (which form the foundation for accuracy of physical dimensional data (i.e., weights and dimensions) by explaining how to properly orient and measure your products)
- *GS1 US Product Measurement Services*
- *GS1 US University courses and webinars*

8.2.3   Attribute Audits

An Attribute Audit is an assessment of select key product attributes to validate that the attribute information being shared with trading partners matches the physical product. A physical audit of the product compared to the most recent information shared about that product is the best way to validate that data governance processes and institutional knowledge exist to support an effective data quality program.

The quality of an organization's product information provides insight to internal challenges and/or opportunities within the organization's processes. The GS1 US National Data Quality Program uses attribute audits as one of the three pillars for achieving high quality data. In addition, companies conduct attribute audits on their own to monitor their data quality and/or their trading partner's data quality. As such, attribute audits as part of data quality are a shared responsibility of both data sources and data recipients.

8.2.3.1 Healthcare-specific Guidance for Data Quality Leveraging Attribute Audits

- Healthcare data recipients should audit attributes when they receive data, physically inspecting product they receive and comparing the results against the product data received from their trading partner. If there is a discrepancy, data recipients should follow the Data Issue Reporting & Resolution Process defined in this document.

- Healthcare data sources should conduct attribute audits on their own data as a form of self-assessment to gain insight about their own data quality, as well as internal challenges and/or opportunities within the organization's processes. This is a good practice for monitoring and maintaining data quality before a customer reports a problem.

- Consider developing a Data Quality Scorecard when auditing attributes. Such a tool could be an Excel spreadsheet with pre-programmed formulas, analytics and charts. Users enter the data from their systems and the data they validate through physical examination, and then the tool identifies discrepancies (based on defined tolerances), analyzes the results, and provides statistics and charts about the quality of that data.

- Individuals that conduct/perform audits, whether for a data source or a data recipient, need to be fully educated on the associated standards.

- The data comparison would be executed against the most recent version of data published in the GDSN for those products audited.

- When ready, undergo the GS1 US attribute audit and get certified by the GS1 US National Data Quality Certification Program.

8.2.3.2 Key Resources

- *GS1 US National Data Quality Program Framework*

- *GS1 Package Measurement Rules*

8.3   Transparent Data Requirements

In its work to adopt and implement the GDSN, the healthcare industry came together to identify a standardized set of attributes to be shared in the GDSN. Beyond those attributes, some demand-side trading partners have additional attributes they need, and/or specific requirements for synchronizing data with them.

It is essential that data sources understand their trading partners' requirements. However, these requirements have not always been well communicated or easily-accessible. Some data recipients have created implementation guides to communicate their data requirements, contact information, etc. Nonetheless, the existence of such materials and where to access them has not always been well communicated either. In order to promote data quality, trading partners need to formalize and simplify the communication of trading partner data requirements.

Important: GS1 US considers clear and accessible trading partner requirements to be a core component for data quality.

8.3.1 Healthcare-specific Guidance for Data Quality Leveraging Transparent Data Requirements

Data Sources

- The best approach is to populate all of the attributes recommended by the GS1 Healthcare US Initiative when loading data into the GDSN. By loading the full data set, data sources will be able to meet most if not all of their trading partner's requirements without having to go back and load additional information. (See Creating the Case for Trusted Data documentation for the list of recommended attributes for GDSN.)

- Use GS1 Global Attribute Explorer for Attributes: Attribute Explorer is an online tool to search and discover trading partner data attribute requirements. Data sources should use Attribute Explorer to access their trading partner's requirements.

- Trading Partner Implementation Guides & Forms: Before synchronizing through the GDSN, check with your trading partners to see if they have any additional materials you need to get started (e.g., Implementation Guides, Data Sync Supplier Information forms, etc.).

  o Some data pools post the implementation guides of their Data Recipients on the data pool's website.

  o Some companies that have supplier/customer portals post their guides and materials on their portal.

- Private Label & Spec Items: Work with Brand Owners (Distributors and Providers) to understand if they are expected to load and publish private label or "spec" items in the GDSN. In some cases, the Brand Owner will specify what attributes they expect from the Data Source (Manufacturer/Supplier)

Data Recipients:

- In order to promote data quality, formalize and simplify the communication of data requirements and/or additional materials.

- Use GS1 Global Attribute Explorer to communicate data requirements: Attribute Explorer is an online tool to search and discover trading partner data attribute requirements. Data recipients should list their requirements in Attribute Explorer to provide a single point of access for data sources.

- Make implementation materials (e.g., Implementation Guides, Data Sync Supplier Information forms, etc.) easily accessible for data sources: post these materials on your data pool's website (if they support that) and/or your own supplier/customer portal.

- Be sure to communicate contact information so that suppliers can work directly with the data recipient company to resolve data sync issues (CIC messages, etc.).

8.3.2 Key Resources

- *GS1 Global Attribute Explorer* (an online tool designed to help trading partners search and browse standardized attributes as defined in the GS1 Global Data Dictionary through GS1 US Industry initiatives)

8.4   Data Issue Reporting & Resolution Process

Anytime trading partners engage in data sharing, a process for communicating questions or concerns about the data should be employed.

GDSN is often used as an authoritative data source for healthcare trading partners. Data Source companies are sharing data with multiple Data Recipients. Occasionally, Data Recipients identify data they received from the GDSN that does not match the physical product. In order to promote data quality, any issue with the data should be resolved through the GDSN via the use of Catalog Item Confirmation (CIC) messages:

- Data Sources: resolve any issues found in the data you publish to the GDSN in order to assure that GDSN remains the current, authoritative source for their data.

- Data Recipients: If you identify incorrect data in your systems, and there is a need to manually correct, be sure to notify the data source to send a correction as well through the GDSN, to ensure all systems are updated and aligned. Data issues need to be resolved through the GDSN. The correct process is to report the issue to the manufacturer using the process defined in this chapter, and let the data source fix it in the GDSN and republish the corrected data to you.

Other industry verticals have created data issue and reporting guidance intended to provide best practice guidance on how to communicate and resolve data issues in the GDSN. Best practice processes have three components. A similar process is recommended for Healthcare.

The process has three components:

Step 1: Report	Data Recipients send a CIC message in the GDSN to report the data issue to the Data Source. (Recipients can also follow up with additional communication to the Data Source using email and/or scorecards.)
Step 2: Research	Parties analyze the issue and research potential causes in order to resolve it.
Step 3: Respond	Data Sources communicate to Data Recipients about the progress and status of the issue resolution throughout the process, and publish the updated/corrected data in the GDSN.

Important: GS1 US considers the Data Issue Reporting & Resolution Process a core component for data quality.

Step 1: Report the Problem

GS1 US recommends that data quality issues be reported electronically through the GDSN using of Catalog Item Confirmation (CIC).

Data recipients may also send scorecards or emails to the data source with the CIC details. However, because these methods are outside of the GDSN, they should be used as a supplement to the CIC, not a substitute.

The CIC provides a standardized message that:

- All GDSN-certified data pools are able to send and receive

- Can be shared between trading partner to confirm receipt and communicate the status of an item that has been synchronized through the GDSN.

A. Catalog Item Confirmation (CIC)

The Catalog Item Notification (CIN) is a GDSN message used to transmit new or updated trade item information from a Source Data Pool to a Recipient Data Pool (and then further to the Data Recipient)

within the GDSN. After the item has been received, Data Recipients send a CIC to the Data Source. CIC messages are sent to Data Sources in response to New Items, Initial Loads and Changes/Corrections.

The CIC is a GDSN message generated by the Data Recipient (the "published to GLN") and sent to the Data Source to inform the Data Source of the status (or "state") of the GTIN(s) that were published in the CIN. Data Recipients indicate the "State" of the item in the header of their CIC message. There are four "states" for CIC response messages:

Received	File has been received by the Data Recipient, but no business decision has been made on the data.
Rejected	Data received, but will no longer be synchronized and updates will no longer be provided.
Synchronized	Data has been received and is integrated, or synchronized, by the Data Recipient.
Review	File has been received, reviewed, and a request is sent to the Data Source asking them to review their data and take action (applies to adds & changes/correct). The Data Recipient has received discrepant data which they cannot synchronize

Data recipients should send a CIC to the Data Source to report data quality issues. The Data Pool(s) for both the Data Source and the Data Recipient are responsible for maintaining a sync list which is a catalog of published Trade Item Hierarchies and their response states. Users should work with their data pool to understand how to access (send and receive) CIC messages.

Key Resources:

For additional information on CIC messaging, including CIC examples, CIC "States", Confirmation Status Codes, and Corrective Action Code Lists:

- *GDSN (Release 3.1) Trade Item Implementation Guide* (Section 13: CIC Response to CIN)

- GDSN Validations (For a list of GDSN Validation rules, please see the *GS1 Global website*.)

B. Scorecards

For trading partners utilizing scorecards, data recipients may also send scorecards to the data source with the CIC discrepancy details. Trading partner scorecards can measure various values, and may even include a measurement for data "Completeness", which may mean one of three things:

- Catalog Completeness – Measuring if the supplier has sent all items which they currently sell or trade with that recipient.

- Healthcare Completeness – Measuring if the supplier has sent all of the attributes outlined in the Healthcare Initiative attribute guide.

- Trading Partner Completeness – Measuring if the supplier has sent all of the attributes required by the recipient. Please note: This may include additional GDSN attributes outside the Healthcare Initiative attribute list.

Note: For consideration by Healthcare organizations - The Foodservice GS1 US Standards Initiative created a *scorecard tool* to support data quality auditing and reporting. This scorecard is an Excel spreadsheet with pre-programmed formulas, analytics and charts that may be used by any trading partner. Users enter the data from their systems and the data they validate through physical examination into the scorecard, and the tool identifies discrepancies (based on defined tolerances), analyzes the results, and provides statistics and charts about the quality of that data.

Foodservice Data Quality Scorecard

Foodservice Data Quality Scorecard Instructions

C. Email

Some data recipients have enhanced their CIC messaging by also sending an email to the data source company with the CIC details. This method is outside of the GDSN, and is managed by trading partners, and in some cases, their data pool and/or solution provider. Many trading partners are using this today as a follow up to verify that their suppliers have received, and are responding to, their data sync issues and questions.

If email is used to communicate with Data Sources, then it is recommended that Data Sources have an established workflow for manning these inquiries and responding to the requester. Further, it is recommended that any email addresses used for such communications not be specific to an individual but rather are addresses that are general mailboxes manned by specific individuals. This ensures continuity of the process as employee responsibilities may change.

Step 2: Research the Problem

A. Data Source

(Prioritize data issues based on volume and the date the item was last checked by either the data recipient or the data source.)

Begin by speaking with your trading partner to make certain you understand the potential issue and what the trading partner is receiving, and that it is not just a misunderstanding/ miscommunication. Then, start at the beginning and look inside of your organization:

1. **"Follow the data"** internally and at your data pool:

   - Check with all of your data owners to verify that the data files are complete.

   - Check with your middleware to verify that the data has been passed to your data pool.

   - Check with your data pool to confirm that files have been received, validated and sent to the Global Registry and/or your trading partners.

2. **Check your data governance processes:**

   - Are these attributes on lockdown or did somebody have access to change it?

   - Check with all internal parties who have access to item data:

     - What has been added, changed or deleted?

     - Check timestamps for any updates.

3. **Talk to your internal teams or solution provider:**

   - Determine if there is truly a discrepancy in the audited data:

     - Work with your packaging teams to understand item weights/dimensions for full cases.

     - Check with the shipping warehouse for a physical measurement.

     - Work with marketing and sales teams to verify they have sent all of the extended data.

     - Check with internal teams (e.g., quality, clinician, regulations, materials management, product development teams, etc.) to confirm that all attributes have been shared.

   - Determine if the issue is in your back-end system or in the data in the GDSN.

4. **Check with your data pool:**

- Make sure that what you sent matches what is reported as the issue by your trading partner.

- Work with your data pool to understand what reports are available (i.e., what can you check on your own and what do you need their help with).

5. **Confirm data sent between data pools:**

    - Did your data pool send the publication to the Data Recipient's data pool?

    - What did the recipient data pool send to the Data Recipient? Does it match what was sent?

    - What CIC messages and details were sent back from the Data Recipient (Recipient data pool to Source data pool)?

B. Data Pool

- Understand if the file has been passed between data pools:

    o What was sent outbound? What was received?

    o Have they received an MDN AS2 message (Message Disposition Notification Applicability Statement 2) which is a confirmation message for the sender)? Can data pool users access this information?

    o Where can users start the search with their data pool?

    o What is your data pool's frequency of CIC monitoring?

C. Data Recipient

- What are your internal processes?

    o Do you receive the XML directly from your data pool or is there some middleware in between the GDSN and your back-end systems?

    o Was there any sort of data transformation of the GDSN data since it was received?

    o If measuring cases, are your tools properly calibrated? Have you re-measured or re-weighed to confirm your initial values?

    o If there are still issues with the data and your trading partner responds back that it is clear on their end, then follow the steps above outlined for data sources to examine your data governance processes for the cause of the issue

Step 3: Respond to Your Trading Partners

Once the issues have been researched, the Data Source should communicate their plans for updating the affected items if necessary.

A. Data Source:

- There is no GDSN response for Data Source companies to send back in response to CIC messages. Therefore, Data Sources need to make Data Recipients aware that work is underway.

- Inform Data Recipients when they should expect to see the "Change" messages through the GDSN so they can plan accordingly if a change was made.

B. Data Recipients:

- If the Data Recipient has any middleware for data review, they will need to work with their solution providers to make certain that these changes are accepted and integrated into their back-end systems at time of receipt.

C. Both:

- Make sure to periodically review outstanding CIC messages and ask for updates accordingly.

- Check with your Data Pool to see if there are any outstanding CIC messages.

- Understand what notifications, reports, etc. are available from your data pool to

9   GS1 Global Attribute Explorer

GS1 Global Attribute Explorer is an intuitive, browser-based search and discovery tool for GDSN attribute standards, including definition, metadata, etc. In addition, it offers a centralized location where Data Recipients can post their data attribute requirements, and where Data Sources can search and discover trading partner requirements and review the associated attribute standards.

GS1 Global Attribute Explorer is a centralized, web-based repository designed to:

- Help industry trading partners search and discover GDSN attribute standards in order to aid users in understanding the breadth and depth of all available/standardized attributes

- Familiarize industry participants with the attribute standards found in both the GS1 Global Data Dictionary (GDD) and within GS1 US Retail Grocery, Foodservice, Healthcare, and Apparel/General Merchandise industry guidelines

- Provide a centralized location where Data Recipients can post their data attribute requirements, and where Data Sources can search and discover them

10   Lessons Learned & Recommendations

- As you begin GDSN implementation, it is recommended that you first pick a few items to synchronize with trading partners as a pilot. As you become more seasoned, you can synchronize entire catalogs (if necessary).

- If you are a data recipient, it is recommended that you give your trading partners timelines for synchronizing.

- It is also important to set up Key Performance Indicators (KPIs) to measure your implementation progress. Some suggestions for initial KPIs could include:

  - Percentage or Number of items with complete data

  - Percentage or Number of items synchronized

  - Percentage or Number of trading partners synchronizing

- One key area to understand clearly when implementing GDSN is attributes definitions. It is important to fully grasp the global definitions of attributes and compare them to your internal field definitions within your systems and databases. You should also review attribute standards for field size and type to align your company's existing system requirements.

- Guidelines for dimensions within the GDSN are specific to the packaging level of the GTINs, and the *GS1 Package Measurement Rules* clearly define how to measure and record package/product dimensions. Because trading partners may have created their own methods for measuring and storing dimensions prior to adopting GDSN, it is important to understand and properly implement the GSDN Package Measurement Rules before sharing or receiving product information via GDSN.

- Another key learning from early adopters is the importance of determining which and how many levels of the GTIN hierarchy and their attributes are important for your organization to store. Most healthcare manufacturers only use the case-level GTIN for trade. But downstream trading partners including distributors, healthcare materials departments and clinicians at the patient bedside need product hierarchy details about all inner packaging all the way down to the unit of use. Data Sources must develop processes and systems to support the multiple levels of information.

- Before beginning any internal integration of the information within your current systems, share product information with your trading partners and identify those areas of your organization and systems where the attributes add value. Clearly defining your roadmap for use of the information helps reduce the need for re-work.

- Audit and align the product attributes to current values in your systems before integrating as well. You may have put processes and programs in place to "lock-down" values depending on the information that was formerly available from your trading partners. With GDSN implementation, these processes and programs may no longer be needed with the GDSN's continuous, real-time flow of product information among your individual trading partners.

- Finally, synchronize GTINs with the brand owner to establish GTIN alignment. Because we as an industry are evolving into the adoption of GS1 Standards for product identification, there may be misalignment in your existing product information. Cleanse your product information internally and across trading partners to address any issues that may exist.

- Consult *GS1 Healthcare US GDSN resources and case studies* which illustrate lessons learned and recommendations for GDSN implementation.

11 Resources

Global Standards Resources

- *How to select a GDSN-certified data pool*

- Please refer to the *GS1 GDSN website* for a full list of GDSN-certified data pools

- *GDSN Operations Manual* (user operations manual for the GDSN)

- *GS1 Global Data Dictionary (GDD)* (a repository of core component and business definitions and their equivalent representations in targeted standards)

- GS1 Global Attribute Explorer

- *GS1 Package Measurement Rules*

GS1 US Implementation Resources

- *Creating the Case for Trusted Data*

- *GS1 Healthcare US GTIN Adoption & Use Model: Implementation Roadmap for U.S Healthcare Supply Chain*

- *GS1 Healthcare US website*

- *GS1 US GDSN Resources for Healthcare*

- *GS1 US education and training*

- *GS1 US National Data Quality Program*

GS1 US Tool Kits

- *GS1 Healthcare US GTIN Supplier Tool Kit*

- *GS1 Healthcare US GTIN Provider Tool Kit*

- *GS1 Healthcare US GLN Supplier Tool Kit*

- *GS1 Healthcare US GLN Provider Tool Kit*

- *GS1 Healthcare US GDSN Supplier Tool Kit*

- *GS1 Healthcare US GDSN Provider Tool Kit*

12 Appendices and Exhibits

12.1 Appendix A: Checklist for Data Quality

All tasks on this list should be reviewed and managed by all roles in the supply chain.

Task Number	Task
1.	**Map** out the data governance process across your organization. ▪ Where does your data come from? ▪ Who has access to your data? ▪ What permissions do they have? ▪ Who is authorized to commit data to your systems? ▪ Who has permissions to add/change/delete? ▪ Is GDSN part of your data governance program?
2.	**Educate** your teams. ▪ Do each of your stakeholders/data owners have the "right" education? ▪ GS1 Standards ▪ GTIN Management Rules ▪ GS1 Package Measurement Rules ▪ GDSN Data Attributes ▪ Your internal data requirements
3.	**Audit** your products. ▪ Should be ongoing – not a one-time event ▪ *Suppliers*: post production, changes, ongoing ▪ *Recipients*: in the warehouse; in the condition received
4.	**Synchronize** products with your trading partners. ▪ *Suppliers*: share your item data with your customers via the GDSN ▪ *Recipients*: request data from your suppliers
5.	**Communicate** with your trading partners. ▪ When issues are discovered, work with your trading partners to understand the source of the issue. ▪ Follow the Collaborative Resolution Process to understand the source of the issue, ownership, and timelines for resolution.

12.2 Appendix B: GDSN Messages for Data Quality

GDSN Messages		
1	CII - Catalog Item Information	Any item (product or service) upon which there is a need to retrieve predefined information and that may be priced, ordered, or invoiced at any point in any supply chain, and thus is stored in a catalog or data pool. Sometimes referred to as "Trade Item." In the GDSN, the catalog item is uniquely identified by the GTIN, Information Provider GLN, and Target Market.
2	RCI - Registry Catalog Item	A business message used to register basic Catalog Item information from the Data Source to the GS1 Global Registry via the Source Data Pool within GDSN.
3	CIS – Catalog Item Subscription	A business message used by the Data Recipient to establish a request for trade item information. The subscription criteria can be any combination of the GTIN, GLN, Target Market and GPC at the exception of the combination with GTIN and GPC that are mutually exclusive. The Recipient Data Pool will forward the CIS to the GS1 Global Registry. The GS1 Global Registry will forward the CIS to one or more Source

		Data Pools that have at least one item that matches the subscription criteria.
4	CI/P – Catalog Item Publication	A business message standard from the Data Source to the Source Data Pool to publish an item within the GDSN. The CIP can be used to publish the item to a specific Data Recipient or a specific Target Market.
5	CIN – Catalog Item Notification	A business message used to transmit new or updated trade item information from a Source Data Pool to a Recipient Data Pool and further to the Data Recipient within the GDSN.
6	CIC – Catalog Item Confirmation	A message standard that refers to electronic communication from the Data Recipient to the Data Source, indicating what action has been taken by the Data Recipient on the item. The confirmation process occurs in the recipient's data pool. Confirmation is not mandatory.

Note: The numbers in the first column correspond to the numbers in the GDSN Message Flow graphic of Figure 3-1 in Section 3.3.

12.3   Exhibit A: Healthcare Vital Attributes

(Note: "*" before Attribute Common Name indicates element is "GDSN – Mandatory")

Attribute Common Name	GDSN Attribute Name	Description from Attribute Explorer	Order to Cash / Procure to Pay (Med Device)	Traceability via EPCIS in U.S. (Pharma)	Patient Bedside Scanning to EHR (Med Device / Pharma)
*Unit GTIN	globalTradeItemNumber	Trade Item Identification for a TradeItem	*Required*	*Required*	*Required*
*Unit Descriptor	tradeItemUnitDescriptorCode	Describes the hierarchical level of the trade item. TradeItemUnitIndicator is mandatory. Examples: "CASE" , PALLET	*Required*	*Required*	*Required*
Name of Information Provider	informationProviderOfTradeItem / NameOfInformationProvider	The party providing the information about the trade item (NAME)	*Required*	*Recommended*	*Required*
*GLN of Information Provider	informationProvider	The party providing the information about the trade item (GLN)	*Required*	*Required*	*Required*
*Target Market Code	targetMarketCountryCode	The code that identifies the target market. The target market is at country level or higher geographical definition and is where a trade-item is intended to be sold.	*Recommended*	*Required*	*Recommended*
*Brand Name	brandName	The recognizable name used by a brand owner to uniquely identify a line of trade item or services. This is recognizable by the consumer.	*Recommended*	*Required, Proprietary Name should be provided here*	*Recommended*
*Global Product Classification Code	gpcCategoryCode	Code specifying a product category according to the GS1 Global Product Classification (GPC) standard	*Recommended*	*Required*	*Recommended*

*Is Trade Item an Orderable Unit?	isTradeItemAnOrderableUnit	An indicator identifying that the information provider considers this trade item to be at a hierarchy level where they will accept orders from customers. This may be different from what the information provider identifies as a despatch unit. NOTE: This may be relationship dependent based on channel of trade or other point to point agreement	*Required*	*Required*	*Required*
*Is Trade Item a Base Unit?	isTradeItemABaseUnit	An indicator identifying the trade item as the base unit level of the trade item hierarchy.	*Required*	*Required*	*Required*
Identification Type Such as: Catalog or Model, HIBC, NDC, DIN(Canada), Buyer Assigned, etc (Part 1)	additionalTradeItemIdentificationTypeCode	Code specifying an additional trade item identification type. Allowed code values are specified in GS1 Code List AdditionalTradeItemIdentificationTypeCode	*Required - Conditional*	*Required - Conditional, NDC Code Type if applicable*	*Required - Conditional*
Number Such as: Catalogue or Model Number, HIBC, NDC11, DIN or Buyer assigned number (Part 2)	AdditionalTradeItemIdentification	Alternative means to the Global Trade Item Number to identify a trade item.	*Required*	*Required - Conditional, NDC Code if applicable*	*Required*
Manufacturer Name (Part 1)	manufacturerOfTradeItem	Party name and identification information for the manufacturer of the trade item	*Required*	*Required*	*Required*
Manufacturer GLN (Part 2)	manufacturerGLN	Party name and identification information for the manufacturer of the trade item	*Required*	*Required*	*Required*
Product Description	additionalTradeItemDescription	Additional variants necessary to communicate to the industry to help define the product. Multiple variants can be established for each GTIN. This is a repeatable field, e.g. Style, Colour, and Fragrance. Allows for the representation of the same value in different languages but not for multiple values	*Required*	*Recommended*	*Required*

*Functional Name	functionalName	Describes use of the product or service by the consumer. Should help clarify the product classification associated with the GTIN. Allows for the representation of the same value in different languages but not for multiple values. NOTE: If the GPC code for "Medical Device" or "Pharma" is provided then Functional Name is not GDSN Mandatory.	*Required - Conditional*	*Required - Conditional*	*Required - Conditional*
Trade Item/Package Depth	depth value	The depth of the unit load, as measured according to the GS1 Package Measurement Rules, including the shipping platform unless it is excluded according to the Pallet Type Code chosen	*Recommended*		*Recommended*
DepthUOM	measurementUnitCode	Any standardized, reproducible unit that can be used to measure any physical property.	*Recommended*		*Recommended*
Trade Item/Package Height	height value	The height of the unit load, as measured according to the GS1 Package Measurement Rules, including the shipping platform unless it is excluded according to the Pallet Type Code chosen	*Recommended*		*Recommended*
HeightUOM	measurementUnitCode	Any standardized, reproducible unit that can be used to measure any physical property.	*Recommended*		*Recommended*
Trade Item/Package Width	width value	The width of the unit load, as measured according to the GS1 Package Measurement Rules, including the shipping platform unless it is excluded according to the Pallet Type Code chosen	*Recommended*		*Recommended*
WidthUOM	measurementUnitCode	Any standardized, reproducible unit that can be used to measure any physical property.	*Recommended*		*Recommended*
Trade Item/Package Gross Weight	grossWeight value	Used to identify the gross weight of the trade item.The gross weight includes all packaging materials of the trade item. At pallet level the trade item, grossWeight includes the weight of the pallet itself. For example, "200 GRM", value - total pounds, total grams, etc. Has to be associated with a valid UOM	*Recommended*		*Recommended*
GrossWeightUOM	measurementUnitCode	Any standardized, reproducible unit that can be used to measure any physical property.	*Recommended*		*Recommended*

*Is Trade Item a Consumer Unit?	isTradeItemAConsumerUnit	Identifies whether the trade item to be taken possession of ,or to be consumed or used by an end user or both, as determined by the manufacturer. The end user could be, but is not limited to, a consumer as in items sold at retail, or a patient/clinician/technician in a healthcare setting, or an operator for foodservice such as restaurants, airlines, cafeterias, etc.	*Recommended*	*Required*	*Recommended*
*Is Trade Item an Invoice Unit?	isTradeItemAnInvoiceUnit	An indicator identifying that the information provider will include this trade item on their billing or invoice. This may be relationship dependent based on channel of trade or other point to point agreement.	*Recommended*	*Required*	*Recommended*
*Is Trade Item a Despatch Unit	isTradeItemADespatchUnit	An indicator identifying that the information provider considers the trade item as a despatch (shipping) unit. This may be relationship dependent based on channel of trade or other point to point agreement	*Recommended*	*Required*	*Recommended*
*Is Trade Item a Variable Unit?	isTradeItemAVariableUnit	Indicates that an article is not a fixed quantity, but that the quantity is variable. Can be weight, length, volume, trade item is used or traded in continuous rather than discrete quantities.	*Recommended*	*Required*	*Recommended*
Is Trade Item Returnable?	isPackagingMarkedReturnable	Trade item has returnable packaging. This is a yes/no (Boolean) where yes equals package can be returned. Attribute applies to returnable packaging with or without deposit.	*Recommended*		*Recommended*
Quantity of Children	quantityOfChildren	Value indicates the number of unique next lower level trade items contained in a complex trade item. A complex trade item can contain at least 2 different GTINs. NOTE: If answer to "Is Trade Item a Base Unit?" = YES, then there may be no value for this attribute.	*Required - Conditional*	*Required - Conditional*	*Required - Conditional*
Total Quantity of Units Contained	totalQuantityOfNextLowerLevelTradeItem	This represents the Total quantity of next lower level trade items that this trade item contains NOTE: Only applies if trade item contains unique GTIN(s) such as a kit containing multiple items.	*Required - Conditional*	*Required - Conditional*	*Required - Conditional*
Next Lower Level GTIN	gTIN (child)	A trade item in the item hierarchy level immediately below NOTE: May only applies if answer to "Is Trade Item Base Unite?" = NO	*Required - Conditional*	*Required - Conditional*	*Required - Conditional*
Quantity of Next Lower Level GTIN	quantityOfNextLowerLevelTradeItem	This represents the Total quantity of next lower level trade items that this trade item contains. NOTE: Applies if a value is provided for "Next Lower Level GTIN"	*Required - Conditional*	*Required - Conditional*	*Required - Conditional*

Unit Quantity	quantityOfInnerPack	Use this for Unit Quantity if Lower Level Packaging exists with no GTIN (Indicates the number of non-GTIN assigned inner-packs of next lower level trade items within the current GTIN level.)			*Required*
Item in Inner Pack Quantity	quantityOfNextLevelTradeItemWithinInnerPack	Indicates the number of next lower level trade items contained within the physical non-GTIN assigned each or inner-packs (inner-pack).			*Required*
Net Content	netContent value	The amount of the trade item contained by a package, usually as claimed on the label. For example, Water 750ml - net content = "750 MLT" ; 20 count pack of diapers, net content = "20 ea.". In case of multi-pack, indicates the net content of the total trade item. For fixed value trade items use the value claimed on the package, to avoid variable fill rate issue that arises with some trade item which are sold by volume or weight, and whose actual content may vary slightly from batch to batch. In case of variable quantity trade items, indicates the average quantity. Allows for the representation of the same value in different units of measure but not multiple values.	*Required*	*Required*	*Required*
Net Content UOM	measurementUnitCode	Unit of Measure of the net content of the trade item. (netContent/@measurementUnitCode)	*Required*	*Required*	*Required*
Classification (Part 1)	additionalClassificationAgencyName	Code specifying the applied additional trade item classification scheme (or system). Allowed values are specified in GS1 code list "Additional Trade Item Classification Code List Code". (additionalTradeItemClassificationSystemCode). NOTE: GS1 Code List. For Med Device Use "5" for UNSPSC.	*Recommended*		*Recommended*
Classification (Part 2)	additionalClassificationCategoryCode	Category code of the trade item based on the alternate classification schema chosen in addition to GS1 classification schema. (additionalTradeItemClassificationValue/additionalTradeItemClassificationCodeValue). NOTE: For Med Device use the appropriate 8-digit UNSPSC Code. These values can be found by visiting www.UNSPSC.org.	*Recommended*		*Recommended*

*Effective Date	effectiveDateTIme	The date on which the information contents of the master data version are valid. This effective date can be used for initial trade item offering, or to mark a change in the information related to an existing trade item. This date would mark when these changes take effect. (effectiveDateTime)	*Recommended*	*Required*	*Recommended*
Packaging Type Code	packagingTypeCode	The dominant means used to transport, store, handle or display the trade item as defined by the data source. This packaging is not used to describe any manufacturing process. Data recipients can use this data for: Space Planning, Data Accuracy (Tolerances), Supply Chain processes, Recycling process (In combination with packaging materials), Product buying/procurement decisions, Tax calculations/fees/duties calculation	*Recommended*		*Recommended*
End Availability Date Time	endAvailabilityDateTime	The date from which the trade item is no longer available from the information provider, including seasonal or temporary trade item and services.		*Required - Conditional*	*Required - Conditional*
Dosage Form Type	dosageFormTypeCodeReference	A dosage form is the physical form of a medication that identifies the form of the pharmaceutical item.		*Required*	
Ingredient Strength	ingredientStrength (# and UoM)	Used to define the strength of each ingredient in a trade item or unit volume of non food and beverage the trade items.		*Required*	
Data Carrier Type Code	dataCarrierTypeCode	A code indicating the type of data carrier physically present on the trade item. NOTE: In US for pharmaceuticals this is defined by regulation to be 2D DataMatrix. This attribute is therefore assumed for US target market but required for O-US.		*Required*	
Serial Number	SerialNumberLocationCode	The location on the item or packaging of a serial number. A serial number is a code, numeric or alphanumeric, assigned to an individual instance of an entity for its lifetime for example a Microscope model AC-2 with serial number 234568 and microscope model AC-2 with serial number 234569. NOTE: In US for pharmaceuticals this is defined by regulation to be 2D DataMatrix. This attribute is, therefore, assumed for the US target market but required for O-US.		*Required*	

Batch/Lot	hasBatchNumber	Indication whether the base trade item is batch or lot number requested by law, not batch or lot number requested by law but batch or lot number allocated, or not batch or lot number allocated. A batch or lot number is a manufacturer assigned code used to identify a trade item's trade item on batch or lot. Differs from Serial Number which is a manufacturer assigned code during the trade item on cycle to identify a unique trade item NOTE: In US for pharmaceuticals this is defined by regulation to be 2D DataMatrix. This attribute is, therefore, assumed in the US target market but required for O-US.		*Required*	
Expiry code	tradeItemDateOnPackagingType Code	Indicates the type of date marked on the packaging for example Best Before Date NOTE: In US for pharmaceuticals this is defined by regulation to be 2D DataMatrix. This attribute is, therefore, assumed for the US target market but required for O-US.		*Required*	
Publication date	publicationDate	The date specified in the field. Mandatory in each occurrence of the composite, and non-repeating. May carry a dateformat attribute: if the attribute is missing, then indicates the format of the date; if both dateformat attribute and element are missing, the default format is YYYYMMDD.		*Recommend ed*	
Established Name	regulatedProductName	The prescribed, regulated or generic product name or denomination that describes the true nature of the food and is sufficiently precise to distinguish it from other foods according to country specific regulation.		*Recommend ed Generic name should be provided here*	
Start Availability Date Time	startAvailabilityDateTime	The date (CCYY-MM-DDTHH:MM:SS) from which the trade item becomes available from the supplier, including seasonal or temporary trade item and services.		*Recommend ed*	
	TradeItemStatus	Indicates if the trade item has been added for the first time (ADD), changed (CHN) or corrected (COR) by the information provider. FOOTNOTE: This is a Command, not an attribute. It is typically populated by the Data Source's Data Pool. In cases where it is not, the data source must populate this command field.	*Recommended*	*Recommend ed*	*Recommended*

Proprietary Statement

This document contains proprietary information of GS1 US. Such proprietary information may not be changed for use with any other parties for any other purpose without the expressed written permission of GS1 US.

Improvements

Improvements and changes are periodically made to publications by GS1 US. All material is subject to change without notice. Please refer to GS1 US website for the most current publication available.

Disclaimer

Except as may be otherwise indicated in specific documents within this publication, you are authorized to view documents within this publication, subject to the following:

1. You agree to retain all copyright and other proprietary notices on every copy you make.

2. Some documents may contain other proprietary notices and copyright information relating to that document. You agree that GS1 US has not conferred by implication, estoppels, or otherwise any license or right under any patent, trademark, or copyright (except as expressly provided above) of GS1 US or of any third party.

This publication is provided "as is" without warranty of any kind, either express or implied, including, but not limited to, the implied warranties of merchantability, fitness for a particular purpose, or non-infringement. Any GS1 US publication may include technical inaccuracies or typographical errors. GS1 US assumes no responsibility for and disclaims all liability for any errors or omissions in this publication or in other documents which are referred to within or linked to this publication. Some jurisdictions do not allow the exclusion of implied warranties, so the above exclusion may not apply to you.

Several products and company names mentioned herein may be trademarks and/or registered trademarks of their respective companies. GS1 US does not, by promulgating this document on behalf of the parties involved in the creation of this document, represent that any methods, products, and/or systems discussed or recommended in the document do not violate the intellectual property rights of any third party. GS1 US has not performed a search to determine what intellectual property may be infringed by an implementation of any strategies or suggestions included in this document. GS1 US hereby disclaims any liability for any party's infringement of intellectual property rights that arise as a result of any implementation of strategies or suggestions included in this document.

This publication may be distributed internationally and may contain references to GS1 US products, programs, and services that have not been announced in your country. These references do not imply that GS1 US intends to announce such products, programs, or services in your country.

GS1 US shall not be liable for any consequential, special, indirect, incidental, liquidated, exemplary, or punitive damages of any kind or nature whatsoever, or any lost income or profits, under any theory of liability, arising out of the use of this publication or any content herein, even if advised of the possibility of such loss or damage or if such loss or damage could have been reasonably foreseen.

GS1 US HEREBY DISCLAIMS, AND YOU HEREBY EXPRESSLY RELEASE GS1 US FROM, ANY AND ALL LIABILITY RELATING TO YOUR COMPLIANCE WITH REGULATORY STANDARDS AND LAWS, INCLUDING ALL RULES AND REGULATIONS PROMULGATED THEREUNDER. GS1 US MAKES NO WARRANTIES OF ANY KIND RELATING TO THE SUITABILITY OF THE GS1 STANDARDS AND THE SPECIFIC DOCUMENTS WITHIN THIS PUBLICATION TO COMPLY WITH ANY REGULATORY STANDARDS, LAWS, RULES AND REGULATIONS. ALL INFORMATION AND SERVICES ARE PROVIDED "AS IS."

*GS1 US employees are not representatives or agents of the U.S. FDA, and the content of this publication has not been reviewed, approved, or authorized by the U.S. FDA. The following information contained herein is for informational purposes only as a convenience, and is not legal advice or a substitute for legal counsel. GS1 US Inc. assumes no liability for the use or interpretation of the information contained herein.

No Liability for Consequential Damage

In no event shall GS1 US or anyone else involved in the creation, production, or delivery of the accompanying documentation be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other loss) arising out of the use of or the results of use of or inability to use such documentation, even if GS1 US has been advised of the possibility of such damages.

IAPMO

In this publication, the letters "U.P.C." are used solely as an abbreviation for the "Universal Product Code" which is a product identification system. They do not refer to the UPC, which is a federally registered certification mark of the International Association of Plumbing and Mechanical Officials (IAPMO) to certify compliance with a Uniform Plumbing Code as authorized by IAPMO.

*If applicable

GS1 US Corporate Headquarters

Princeton South Corporate Center, 300 Charles Ewing Boulevard
Ewing, NJ 08628 USA
T +1 937.435.3870 | **E** info@gs1us.org

www.gs1us.org

Connect With Us

6 1414102683 8