Improving Patient Safety and Supply Chain Efficiency

Healthcare Supplier Tool Kit
Global Data Synchronization Network® (GDSN®)
GS1 Healthcare US®

HEALTHCARE SUPPLIER TOOL KIT

Global Data Synchronization Network™ (GDSN®)

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# Improving Patient Safety and Supply Chain Efficiency

## Table of Contents

**EXECUTIVE SUMMARY** ................................................................. 4  
**ABOUT GS1®** ........................................................................... 5  
**INTRODUCTION TO STANDARDS & THE HEALTHCARE SUPPLY CHAIN** .................................................. 6  
  - **How Standards Help to Solve Supply Chain Problems** ............................................................... 7  
  - **How the Standards Work Together** ........................................................................................... 7  
  - **How Standards Benefit the Healthcare Supply Chain** ............................................................... 9  
**ABOUT THE STANDARDS** .............................................................. 10  
  - **Global Location Number (GLN)** ............................................................................................... 10  
  - **Global Trade Item Number™ (GTIN®)** .................................................................................. 10  
  - **Global Data Synchronization Network™ (GDSN®)** ................................................................ 10  
  - **United Nations Standard Products and Services Code® (UNSPSC®)** ....................................... 10  
**THE CASE FOR THE GLOBAL DATA SYNCHRONIZATION NETWORK™ (GDSN®) ................................................... 11  
  - **The Problem: Inaccurate Information in Customer Databases** ................................................. 11  
  - **The Solution: The Global Data Synchronization Network** ...................................................... 12  
**WHAT IS THE GDSN?** ................................................................... 12  
**HOW DOES THE GDSN WORK?** ..................................................... 13  
  - **Authoritative Data Sources** ...................................................................................................... 14  
    - **Information Storage** .............................................................................................................. 14  
    - **Information Sharing** ............................................................................................................ 14  
  - **Data Synchronization** .............................................................................................................. 15  
**ADVANTAGES OF USING THE GDSN IN THE HEALTHCARE SUPPLY CHAIN** ........................................... 16  
**BENEFITS TO HEALTHCARE SUPPLIERS** ................................................. 17  
  - **Supply Chain Benefits** ........................................................................................................... 17  
  - **Patient Safety Benefits** ........................................................................................................... 18  
**2012 GTIN SUNRISE** ........................................................................ 18  
**IMPLEMENTING THE GDSN IN YOUR COMPANY** ...................................................... 19  
  - **Step One: Establish Executive Support** .................................................................................... 20  
  - **Step Two: Form a GDSN Management Advisory Group** ........................................................ 21  
  - **Step Three: Establish Your GDSN Operational Team** ............................................................. 21  
  - **Step Four: Initiate Education for Advisory Group & Operational Team** ............................... 22  
  - **Step Five: Select Data Pool, Connect to the GDSN & Establish an Implementation Strategy** .......... 22  
  - **Step Six: Assess Information Systems** .................................................................................... 23  
  - **Step Seven: Ensure Data is Ready** .......................................................................................... 24  
  - **Step Eight: Develop & Initiate Project Communication** ........................................................ 24  
  - **Step Nine: Engage Customers** ............................................................................................... 25  
  - **Step Ten: Conduct Testing with Customers** ......................................................................... 25  
  - **Step Eleven: Make Adjustments to Initial GDSN Implementation Plan** .................................... 26  
  - **Step Twelve: Create Standard Operating Procedures** ............................................................ 26
Executive Summary

The purpose of this document is to provide guidance to healthcare suppliers about the need for a central source of supply chain information their customers can use to feed all of their systems with accurate, up-to-date information about products and supply chain partners. To that end, it introduces and explains the GS1 Global Data Synchronization Network™ (GDSN®), and describes how the GDSN provides an authoritative source of supply chain information and an automated process for ensuring that the information remains reliable, accurate, properly formatted, and up-to-date. In addition, the benefits to both supply chain management and patient safety are discussed, and guidance for assessing GDSN ROI for your company is included as well. Finally, this document provides detailed steps for implementing the GDSN in your company.

Using this document, you will better understand how the lack of a central source for supply chain information results in error-prone, unreliable and inefficient data management, and how use of the GDSN will best fulfill your need for an efficient and effective method for updating all of your customers’ systems automatically and in real-time whenever there is a product change. And, using this document, you will learn how to get that effort underway today!

GS1 Healthcare US would like to thank the members of the GS1 Healthcare US Global Data Synchronization Network Implementation Workgroup for their hard work and dedication in developing the first U.S. Healthcare Supplier Tool Kit for GS1 Standards.
About GS1®

GS1 is a leading global organization dedicated to the design and implementation of standards and solutions to improve the efficiency and visibility of supply and demand chains, both globally and across sectors. GS1 is a fully integrated global organization, with 108 Member Organizations (like GS1 US™) serving over a million companies doing business across 150 countries. Together, GS1 and its subsidiaries and partnerships connect companies with standards-based solutions that are open, consensus-based and universally endorsed.

About GS1 US™

GS1 US is the Member Organization of GS1 that serves companies in the United States. As such, it is the national implementation organization of the GS1 System dedicated to the adoption and implementation of standards-based, global supply chain solutions in the United States. GS1 US currently serves over 200,000 U.S. member companies -- 16,000 of which are in healthcare.

About GS1 Healthcare

GS1 Healthcare is a global, voluntary Healthcare user group leading the healthcare sector to the successful development and implementation of global standards to enhance patient safety and supply chain efficiencies. GS1 Healthcare consists of participants from all stakeholders of the healthcare supply chain: manufacturers, wholesalers & distributors, as well as hospitals and pharmacy retailers. GS1 Healthcare also maintains close contacts with regulatory agencies and trade organisations worldwide.

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 improve patient safety and supply chain efficiency. GS1 Healthcare US brings together members from all segments of the healthcare industry to address the issues that most impact healthcare in the United States. Facilitated by GS1 US, GS1 Healthcare US is one of twenty-seven local GS1 Healthcare user groups around the world that supports the adoption and implementation of global standards developed by GS1.
Introduction to Standards & the Healthcare Supply Chain

Suppliers in the healthcare industry use GS1 Standards with their consumer goods retail customers and have experienced the many benefits of using one industry standard in the United States and globally. Healthcare suppliers, like suppliers in other industries, have found that using GS1 Standards improves information quality and promotes efficient business processes. These improvements translate to significant real world benefits, including simplified supply chain management, reduced labor costs, more efficient payment and reporting processes, better cash flow, and increased customer satisfaction.

As healthcare suppliers have been experiencing the benefits of using GS1 Standards with their retail customers, a movement to adopt and implement data standards in the healthcare supply chain has been building across the healthcare industry. This movement has its roots in two revealing studies. First, the Efficient Healthcare Consumer Response (EHCR) study of 1996, the first comprehensive analysis of healthcare standards, found that $11 billion is wasted each year in the healthcare supply chain primarily because data standards are either entirely lacking or not as widely used or well-developed as in other industries. Second, a groundbreaking report on patient safety issues by the Institute of Medicine in 1999 (and a follow-up report five years later) cited staggering statistics about medical error and widespread systemic problems. The problems highlighted in those studies have risen to the forefront of national attention today, and the momentum behind the movement to adopt and implement data standards in the healthcare supply chain is directly related to the fact that standards are essential for solving those problems.

In response, a growing number of hospitals, healthcare suppliers and healthcare-related organizations have chosen the GS1 System of standards to help them improve supply chain efficiency and patient safety. For over thirty-five years, the GS1 System has provided globally accepted identifiers and a common language for the communication of supply chain information about products, services and locations in order to improve the accuracy, speed and efficiency of business processes.

The GS1 System is the most widely used supply chain standards system in the world, utilized in twenty-three sectors and industries including GS1’s core sectors of Healthcare and Fast Moving Consumer Goods (FMCG), as well as Transport, Defense and many others.
How Standards Help to Solve Supply Chain Problems

Without standards, supply chain partners are left to develop their own identifiers and data formats, resulting in numerous proprietary “standards” for healthcare suppliers and providers to manage. The existence of numerous “standards” causes supply chain inefficiencies and inaccurate data that insert unnecessary cost and confusion into business processes. For healthcare, the absence and/or under-utilization of data standards has resulted in medical errors, widespread systemic problems and $11 billion wasted in the healthcare supply chain each year. Accurate product and location information is essential for all supply chains in order to support orders, invoices, deliveries, as well as customer service and marketing activities. Global standards provide a common language for that information that can be used by any supply chain partner, in any industry, in any location around the world.

Global standards promote simplicity, consistency and accuracy in supply chain communications. In today’s complex markets, supply chain lines are blurring and channels of distribution for various sectors are overlapping. This is especially true of the healthcare industry where manufacturers of healthcare products often supply both hospitals and consumer goods retailers in both the U.S. and across the globe; pharmacies and hospitals purchase consumer goods as well as healthcare products; and the pharmaceutical supply chain has expanded to include supermarkets and consumer goods retailers in addition to traditional pharmacies. Global standards are essential in this environment.

How the Standards Work Together

GS1 Identification Numbers provide the link between an object and the information pertaining to it. When users assign a GS1 Identification Number, they define a set of standardized information (known as attributes) about the object to which that identifier relates (e.g., size, weight, location). The GS1 System specifies the list of attributes that must be defined for each GS1 Identifier, and provides a precise definition as well as acceptable values and data formats for each attribute. Standardized attributes about products include core data like selling unit, item dimensions, and product classification. Once defined by the user, those attributes are then stored in a GDSN-certified Data Pool and shared with supply chain partners using the Global Data Synchronization Network™ (GDSN®). Through this process, GS1 Identification Numbers not only identify an object, but also provide a link to information about that object.

This linkage is tremendously valuable. In fact, twenty-three industry sectors have used GS1 Global Trade Item Numbers (GTIN®), Global Location Number (GLN) and the GDSN as the foundation for a wide range of efficiency building solutions that have improved their operations and supported their business processes for decades. Likewise, with GTINs, GLNs and the GDSN, the healthcare supply chain can lay the foundation for a wide range of solutions to improve supply chain efficiency and patient safety across the healthcare industry.

To illustrate this, Figure 1 below uses the image of a house to represent the connection between the standards and how they support the healthcare supply chain. The roof of the house represents the ultimate goals: supply chain
efficiency and patient safety. In order to raise that roof and achieve those goals, the healthcare supply chain needs a strong foundation and pillars of support.

**Figure 1: Building Patient Safety with GS1 Standards**

The foundation is the basis on which the pillars and the entire house are built. To achieve supply chain efficiency and patient safety, the ultimate goals in our house example, the strongest foundation is built with global standards that can be used by all supply chain partners regardless of industry sector or location. GTIN (standardized product identification), GLN (standardized location identification), and GDSN (standardized product definitions) provide such a foundation by fostering consistency and accuracy in supply chain information.

Pillars are built on the foundation to raise the house and support the roof. The pillars in Figure 1 represent the numerous and ever-evolving tools and applications that healthcare supply chains can use to improve supply chain management and patient safety. The foundation of global standards provides the basis for developing those tools. Of course, a house can be built on a lesser foundation, like proprietary standards implemented across an individual organization. Although such a house can still realize some improvements to safety and efficiency, only a house built on a strong foundation of global standards has the interoperability across all supply chain partners to maximize safety and efficiency.

The tools and applications represented in the pillars of Figure 1 advance the goals of supply chain efficiency and patient safety by improving healthcare business processes.

- **Automatic Data Capture** (e.g., scanning a bar-coded GTIN on a bottle of medication or hospital room) replaces manual data entry, which reduces human error and expedites the process of recording information.
- **e-Commerce** replaces paperwork with automated transactions that are more efficient and accurate.
- **Electronic Record Management** using standards for various types of information (e.g., medical devices, medication, etc.) ensure compatibility and interoperability with other systems, optimizing both the records and the systems.
- **Asset and Equipment Tracking** systems identify specific assets and locations so facilities know where those assets are when they need them (e.g., IV pumps, blood pressure monitors, wheel chairs, etc.).
- **Traceability** applications promote supply chain security by facilitating product recalls and reducing the risk of counterfeit goods.
How Standards Benefit the Healthcare Supply Chain

Global standards provide a common language for product and location information that can be used by any supply chain partner, in any industry, in any location around the world. Global standards support healthcare business processes and can bring many benefits to the healthcare industry, such as:

- Fewer medication errors through efficient automated identification: the right product for the right patient at the right time through the right route and in the right dose
- More effective product recalls
- Efficient traceability
- More time with patients, less time spent on manual documentation
- Cost reduction through increased supply chain efficiency
- Improved order and invoice processes
- More efficient receiving
- Reduced inventory
- Increased productivity in business processes
- Improved shelf management
- Improved service levels/fill rates
- Improved management of manufacturing/supply costs
- Elimination of the need for re-labeling with proprietary codes
- Supports regulatory compliance

In the journey to improve supply chain efficiency and patient safety, global standards have a large role to play. This toolkit is intended to guide you on that journey so that you can start realizing these benefits today.


About the Standards

The GS1 System is an integrated suite of global standards that provides for accurate identification and communication of information regarding products, assets, services and locations. Using GS1 Identification Numbers, companies and organizations around the world are able to globally and uniquely identify physical things like trade items, assets, logistic units and physical locations, as well as logical things like corporations or a service relationship between provider and recipient. When this powerful identification system is combined with the Global Data Synchronization Network (GDSN), the connection is made between these physical or logical things and the information the supply chain needs about them.

Global Location Number (GLN)

The Global Location Number (GLN) is the globally unique GS1 Identification Number for locations and supply chain partners. The GLN can be used to identify a functional entity (like a hospital pharmacy or accounting department), a physical entity (like a warehouse or hospital wing or even a nursing station), or a legal entity (like a health system corporation). The attributes defined for each GLN [e.g., name, address, location type (e.g., ship to, bill to, deliver to, etc.)] help users to ensure that each GLN is specific to one unique location within the world.

Global Trade Item Number™ (GTIN®)

The Global Trade Item Number (GTIN) is the globally unique GS1 Identification Number used to identify “trade items” (i.e., products and services that may be priced, ordered or invoiced at any point in the supply chain). GTINs are assigned by the brand owner of the product, and are used to identify products as they move through the global supply chain to the hospital or ultimate end user. The GTIN uniquely identifies a product at each packaging level (e.g., a blister of two aspirin tablets; a bottle of 100 aspirin tablets; etc.).

Global Data Synchronization Network™ (GDSN®)

Each user not only defines and maintains its own GLNs and GTINs with their associated attributes, but is also responsible for sharing this information with its supply chain partners. To support those efforts, the Global Data Synchronization Network (GDSN) provides an efficient and effective approach to (1) storing GS1 Identifiers with their associated attributes, (2) checking to make sure that the identifiers and attributes are properly defined and formatted, and (3) sharing that information with supply chain partners. The GDSN offers a continuous, automated approach to data management that ensures that supply chain information is identical among trading partners, increasing data accuracy and driving costs out of the supply chain.

United Nations Standard Products and Services Code® (UNSPSC®)

The United Nations Standard Products and Services Code (UNSPSC) is a hierarchical set of product categories used by supply chain partners worldwide to classify their products and services. The UNSPSC provides a single, global classification system for all products and services in all industry sectors. Use of the UNSPSC enhances company-wide visibility of spending analysis, and promotes cost-effective procurement. As a result, the UNSPSC is used extensively around the world in electronic catalogs, search engines, procurement application systems and accounting systems.

The United Nations Development Program (UNDP) and Dunn & Bradstreet (D&B) jointly created the UNSPSC in 1998 through the merger of the U. N. Common Coding System and D&B’s Standard Products and Services Classification. GS1 US serves as the code manager for the UNSPSC.
The Case for the Global Data Synchronization Network™ (GDSN®)

The Problem: Inaccurate Information in Customer Databases

There are many systems across healthcare organizations that use and rely on supply chain information about products and supply chain partners: for example, inventory replenishment and distribution systems, billing/accounts payable, Barcode Point of Care (BPOC) systems, prescription drug pedigree systems, medical device reporting, etc. Although there are many systems using the same information about products and supply chain partners, there is typically no central database at the healthcare organization that houses all of that information and ensures that it is accurate and up-to-date (i.e., an “authoritative source” for information). Instead, each system generally uses its own database. As a result, there is no method for ensuring that the information about products and supply chain partners being used in one system is the same as the information being used in another.

Moreover, whenever a supplier updates or changes any of its product or party information, all of the disparate systems and databases that rely on that information must be updated individually. Unfortunately, this approach to data management undermines the reliability of the information being used to support the healthcare organization’s systems – and it comes at a high cost for both supply chain management and patient safety. In fact, the use of inaccurate supply chain information costs the healthcare industry billions of dollars annually. Consider the following1:

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

Sales personnel can spend 25% to 55% of sales calls answering questions related to basic item information and invoice errors. Not only is this a significant drain on productivity, but it is also a significant drain on the time available for revenue-generating activities by sales personnel.2

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1 William L. Rosenfeld & John L. Stelzer, Data Synchronization in Healthcare: A Solvable Problem, Sterling Commerce, http://findarticles.com/p/articles/mi_m0BPC/is_4_31/ai_n19002635.
Manufacturers need one method of updating all of their customers’ systems efficiently, automatically and in real-time whenever there is a product change. The challenge is two-fold. First, customers/providers need one central source of supply chain information that all of their systems use for information about products and supply chain partners. Second, suppliers need a process for ensuring that the information in that central source is accurate, properly formatted and up-to-date.

**The Solution: The Global Data Synchronization Network**

The solution to these problems is the GS1 Global Data Synchronization Network (GDSN). The GDSN is the GS1 solution for accurate product and party/location information within a company/organization and across supply chains. The GDSN enables you and your customers to establish one, authoritative source of supply chain information from which all of their systems can pull information about products and supply chain partners. In addition, the GDSN empowers suppliers with a highly efficient automated process for updating all of their customers’ systems automatically and in real-time whenever there is a product change. With the GDSN, suppliers finally have an efficient and effective method for ensuring that the information in their customers’ systems is accurate, properly formatted and up-to-date.

**What is the GDSN?**

The GDSN is a network of interoperable data pools connected by the GS1 Global Registry. The GDSN-certified Data Pools store and manage supply chain information for their users, and the GS1 Global Registry connects those data pools together.

**Table 1: Components of the GDSN**

<table>
<thead>
<tr>
<th><strong>GDSN-certified Data Pools</strong></th>
<th>GDSN-certified Data Pools are warehouses for GLN and 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 ensure that all of the information is properly defined and formatted, and manage the on-going communication of information among supply chain partners.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GS1 Global Registry</strong></td>
<td>The GS1 Global Registry maintains the data pool location of each GTIN and GLN in the GDSN. This is how the GDSN knows where GLN and GTIN information can be found. By maintaining the data pool location of each GTIN and GLN in the GDSN, the GS1 Global Registry serves as the “yellow pages” for the GDSN so that everyone can be connected regardless of where their information is stored.</td>
</tr>
</tbody>
</table>

With that high level design, the GDSN offers a standards-based approach to (1) storing supply chain information, (2) ensuring that the information is properly defined and formatted, and (3) keeping that information up-to-date.
Improving Patient Safety and Supply Chain Efficiency

Figure 2: High level view of the GDSN illustrating the network of interoperable data pools connected together by a centralized registry.

For simplicity, Figure 2 shows each supply chain partner using a different data pool. However, it should be emphasized that data pools are not specific to one type of supply chain partner. In fact, data pools can service any type of company/organization, and supply chain partners may actually find themselves using the same data pool. The functionality and operation of the GDSN are the same regardless.

How does the GDSN work?

The GDSN uses the GS1 identification and data standards as the common language for supply chain information. Specifically, the GDSN uses the Global Location Number (GLN) for information about supply chain partners, and the Global Trade Item Number (GTIN) for information about products. (For more information about GLN and GTIN, please refer to the Healthcare Supplier Tool Kit for each of those topics.)

Both suppliers and providers assign their own identifiers. Healthcare suppliers assign GTINs to all of their products and GLNs to their entities and locations based on GS1 Standards and GS1 Healthcare Allocation Rules. Healthcare suppliers include manufacturers and distributors, as well as repackers and kit manufacturers. Healthcare providers assign GLNs to their various locations and entities based on GS1 Standards. Once an identifier is assigned, the information (known as attributes) about the product and party to which the identifier relates are defined (e.g. description, size, pack, name, address, etc.). The attributes that must be defined for each GLN and GTIN, as well as the specific format for that information, are prescribed by the GS1 Standards.

The GTIN attributes for healthcare products are provided in the appendices of this document. In addition, there is also a downloadable spreadsheet online. The spreadsheet has several useful tabs. Navigation among the tabs is set up to be user friendly. In addition, your GDSN-certified Data Pool can further explain requirements for populating the different data fields. For the link to the GTIN attributes for healthcare products spreadsheet, please refer to the References section of this document.

The GDSN works to ensure that all supply chain partners are using the same data through the use of authoritative data sources and data synchronization.
This Tool Kit is intended to introduce the GDSN to healthcare suppliers at a high level. At that level, healthcare suppliers should simply think of the GDSN as the tool for ensuring that the information in their customers’ systems is accurate, properly formatted and up-to-date. For those interested in more information about how the GDSN works, this section provides a few more details. However, suppliers are encouraged to not get distracted by the details of how the GDSN works. Most of the operational processes introduced in this section are taken care of for you behind the scenes by your GDSN-certified Data Pool and the GS1 Global Registry.

Authoritative Data Sources

GDSN-certified Data Pools serve as standards-based repositories for party and product information. A list of all GDSN-certified Data Pools in the U.S. is provided in the Appendix A of this document. Please refer to the GDSN website for a full list of GDSN-certified Data Pools (www.gs1.org/gdsn).

Information Storage

Once the identifiers and attributes are defined, GDSN users store their identifiers with the corresponding information in a GDSN-certified Data Pool (known as uploading or on-boarding data). The GDSN-certified Data Pool checks all information to ensure it is properly defined and formatted per GS1 Standards (known as validation), and then registers the corresponding GTINs and GLNs with the GS1 Global Registry (known as registration).

Information Sharing

This information is obtained by the GDSN-certified Data Pool through a process known as subscription. Through their GDSN-certified Data Pools, the customer submits a “subscription request” for a supplier’s GLNs/GTINs. The supplier “authorizes” its data pool to publish the information to that customer.

GDSN-certified Data Pools manage subscriptions for their users, and process the exchange of information among their respective data pools using the GS1 Global Registry to obtain the necessary data pool information.
Data Synchronization

“Data synchronization” refers to the process of keeping data in two or more computers/systems up-to-date so that each computer/system contains identical information. Data synchronization ensures that when information is added, deleted or changed in one computer/system, it is also added, deleted or changed in all of the others. Data synchronization provides continuous, real time updating of data in different databases in order to ensure that all users are using the same data at any given point in time. The subscription process described above is the mechanism that supports data synchronization in the GDSN.

GDSN-certified Data Pools manage subscriptions for their users. Whenever information changes, GDSN participants only need to make the changes in their GDSN-certified Data Pool. Once they send the updated information to their data pool, the data pool takes over -- validating the new information for compliance with GS1 Standards and notifying the data pools of all supply chain partners who subscribe to the information about the update. This process ensures that all supply chain partners are using identical, up-to-date, GS1 Standards-compliant data, and that all applications within a company/organization are using the same, reliable data. The GDSN creates a single point of truth for consistent and reliable product data, globally.

Figure 5: GDSN Data Synchronization – manufacturer revised information for one of its GTINs
Advantages of Using the GDSN in the Healthcare Supply Chain

With the GDSN, suppliers finally have an efficient and effective method for ensuring that the information in their customers’ systems is accurate, properly formatted and up-to-date. In addition, the GDSN empowers suppliers with a highly efficient automated process for updating all of their customers’ systems automatically and in real-time whenever there is a product change.

The GDSN today can support all participants in the U.S. healthcare supply chain (*with some changes or enhancements to their current systems*). Many manufacturers and distributors in other industries are already successfully using the GDSN. In fact, the GDSN has over 19,000 subscribers worldwide, with information on 3.8 million products across multiple industries residing in GDSN-certified Data Pools. A key objective for GS1 Healthcare US is to bring similar success to the U.S. healthcare industry in order to improve the reliability of healthcare supply chain information in an efficient and effective manner. Advantages of the GDSN include:

- **Reliable Data**: The GDSN promotes reliable data by providing authoritative data sources that ensure that product and supply chain partner information is identical across IT systems and among supply chain 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 and supply chain partner 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 competing data pools.
Benefits to Healthcare Suppliers

The GDSN enables healthcare suppliers to ensure that all of their customers’ systems are using accurate, up-to-date information about the supplier and its products. In addition, the GDSN empowers suppliers with a highly efficient, automated process for updating their information in all of their customers’ systems automatically and in real-time. This translates to significant benefits for supply chain management and patient safety. Use of the GDSN should be a critical component of your global data alignment strategy.

Supply Chain Benefits

Use of the GDSN promotes data accuracy and minimizes labor-intensive administrative activities, enabling suppliers to improve business processes and operations and maximize human assets. As a result, supply chain benefits of the GDSN are found not only in operational efficiencies and cost avoidance, but also in additional revenue generation. At the same time, because of the publication and subscription model upon which the GDSN is based, manufacturers maintain control over and authorize which information about their products is shared with which customers or end-users. Some of the supply chain benefits of the GDSN include:

- **Increased sales force productivity**: Use of the GDSN reduces the amount of time your sales force spends on administrative tasks (like providing basic item information and resolving invoice errors) during sales calls, thereby increasing the time available for revenue-generating sales efforts.

- **Freight optimization & reduced transportation costs**: The GDSN promotes accuracy in weights and measures so that trucks are full and fewer trips are made. This enables suppliers to better utilize their distribution and transportation networks, making products flow faster and transportation costs drop.

- **Improved supply chain management**: Use of the GDSN improves order and invoice accuracy, reducing ordering mistakes and invoice disputes and improving fill rates. This not only increases productivity within order and item administration, but also enhances customer satisfaction.

- **Streamlined new product introduction**: Use of the GDSN enables suppliers to communicate new item information faster and easier, streamlining new product introduction and increasing speed to market. Speed to market generates increased revenue, and can be a competitive advantage considering the demand for and speed with which new items sell in the healthcare industry.
Improving Patient Safety and Supply Chain Efficiency

Patient Safety Benefits

Beyond business, beyond the supply chain, healthcare is about much more than supply and demand. In healthcare, caregivers need the right products, in the right location, at the right time to ensure the proper patient treatment. There is perhaps no other industry where accuracy and speed are more important. The GDSN enables suppliers to support patient safety efforts by facilitating the dissemination of accurate and reliable product information throughout their customers’ facilities. Reliable product information about all of the various products used in healthcare facilities has many benefits for public health and patient safety including:

- **Right product**: Use of the GDSN enables hospitals to ensure that their systems have the most accurate, up-to-date product information to support patient care and patient rights.
- **Up-to-date product information**: The GDSN provides rapid access to information on new, discontinued, replacement and recalled products.
- **Supply chain integrity**: The GDSN promotes a safe and secure supply chain by improving the reliability and accuracy of product and partner information.

In addition to this kit for suppliers, GS1 Healthcare US has prepared a GDSN tool kit for healthcare providers as well. Because it describes the uses and benefits of GDSN for healthcare providers (i.e., your customers), the provider tool kit may be a good resource for suppliers developing their competitive advantages business case. (A link to the Healthcare Provider Tool Kits is provided in the References page of this document.)

2012 GTIN Sunrise

To improve patient safety and supply chain efficiency, organizations and companies throughout the U.S. healthcare supply chain have announced their support to adopt GS1 Standards by the industry-accepted sunrise dates of 2010 for the GS1 Global Location Number (GLN) to standardize location identification and 2012 for the GS1 Global Trade Item Number (GTIN) to standardize product identification. The “2012 GTIN Sunrise” date (December 2012) established by the healthcare industry calls for the adoption of GTINs in lieu of custom product numbers and includes the use of the GDSN to store and communicate the associated product attributes of each GTIN. The benefits of such an adoption have been delineated throughout this Tool Kit. Healthcare supply chain participants are working to meet the following GTIN criteria by December 2012:

- GTINs are assigned to healthcare products.
- GTINs are used in business transactions.
- GTINs are marked on appropriate packaging levels.
- GTINs are scanned at points-of-delivery to enhance clinical process.
- GTINs are used in product returns and recalls.
- GTINs are registered in a GS1 GDSN-certified Data Pool.

More information on the 2010 GLN and 2012 GTIN Sunrise can be found at http://www.gs1us.org/hcsunrise.
Implementing the GDSN in Your Company

So, what exactly does it take to begin using the GDSN in your company? What are the steps and who is involved? This section answers these questions with detailed, step by step instructions for implementing the GDSN. These steps involve critical areas such as establishing executive support, forming cross-functional teams, creating internal and external communication strategies, initiating customer involvement, and establishing standard operating procedures.

In order to begin using the GDSN, suppliers need to have GTINs assigned to their products and GLNs assigned to their publishing locations. If your company has already assigned or begun to assign GTINs to its products, it is already well on its way to implementation of the GDSN. It is also possible that a division of your company is already utilizing the GDSN, particularly if it sells some of its products to a large retailer such as Wal-Mart, Home Depot, Lowe's, and retail pharmacies such as CVS, Walgreens and Rite-aid, among other retailers. 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 below. (For more information about GTINs and GLNs, please refer to the Healthcare Supplier Tool Kits on those topics.)

The order of the implementation steps in this section is a recommendation developed by healthcare industry participants. Each manufacturer'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 data pool, and may be able to start their healthcare implementation with the data readiness and attribute population steps based on guidance from their retail counterparts. Moreover, manufacturers with multiple and unrelated ERP systems may want to drive implementation at the division level, requiring executive leadership at multiple levels with multiple tracks to overall implementation. As a result, the order in which the implementation steps are presented below should be used as a guideline.

For links to all of the Tools listed in the implementation steps, please refer to the References section of this document.
Step One: Establish Executive Support

The goals in this step are to inform and educate executive management on the value of standards adoption and the need for industry-wide implementation, and to obtain executive approval to proceed with GDSN implementation. It is also a good idea to highlight to senior management any competitive advantages you believe will accrue to the company as a result of implementing use of the GDSN. As with any project that will impact the business processes of the company, the support of senior management is critical.

Actions

- Prepare a presentation on the value of GDSN and a GDSN implementation plan. Consult this Tool Kit for information to support your presentation. In addition:
  - Determine the present state of the company in terms of readiness for GDSN implementation.
  - Gather “Dear supplier letters,” GPO announcements, 2012 GTIN Sunrise information, and competitor’s progress in this area as part of the intelligence gathering process to support the business case.
  - Use the Standardization…Stat! awareness video developed by the healthcare industry to increase awareness, at all organizational levels, of the need for standards adoption.
  - Consult use cases such as the Seton Family of Hospitals / BD Success Story.
  - Contact GS1 Healthcare US for standard presentation charts.
  - Cite the benefits identified in these materials.
  - Include language to speak to specific stakeholders as necessary (e.g., reinforce enhanced business benefits as GDSN use becomes more robust; speak to the trend to GS1 Standards at providers and GPOs; etc).
  - Stress the importance of having an organization-wide data management policy.

- Deliver the GDSN presentation and implementation plan to senior management.

- Secure approval to initiate the project and form the needed teams (i.e., GDSN Management Advisory Group, and the GDSN Operational Team).

Tools

- GDSN presentation and industry use cases from the GS1 Healthcare US Online Document Library GDSN Implementation folder
- Standardization…Stat! industry awareness video from the GS1 Healthcare US Website
- GDSN announcements from the GS1 Healthcare US Document Library Industry Announcements folder
- 2012 GTIN Sunrise information
- Seton Family of Hospitals / BD Success Story
Step Two: Form a GDSN Management Advisory Group

The goal in this step is to establish an Advisory Group to organize the Team based on company priorities. Formation of a cross-functional Group including members outside of supply chain functions promotes buy-in, supports communication efforts, and ensures proper input from the areas most impacted by implementation.

**Actions**

- Recruit and solicit commitments for participation. Any functional area of the organization that touches products or locations should participate at some level. The Group should include representation from the following areas:
  - Packaging Engineers
  - Financial Controller
  - Quality & Regulatory Teams
  - Government Relations
  - Supply Chain Distribution
  - Logistics/Shipping & Receiving
  - Warehouse Operations
  - Purchasing
  - Procurement
  - Public Relations (internal)
  - Information Systems (business & operational)
  - Group Purchasing Representative
  - National Accounts Management
  - Primary Distributor Representative
  - Sales & Marketing
  - Customer-facing Teams (e.g., Call Center, Catalog, etc.)

**Tools**

- GDSN presentation materials (prepared in Step 1)

Step Three: Establish Your GDSN Operational Team

The goal in this step is to establish a GDSN Operational Team. Implementation of the GDSN will require the involvement of multiple individuals, and close coordination with your GTIN Operational Team as well as your GLN Operational Team.

**Actions**

- Identify and select participants. It is suggested that those with responsibility for the following functions be included:
  - Master data management
  - Information technology
  - Operations
  - Product management
  - Sales/Sales Operations
  - Customer Service
- Establish the role of each participant.
- Update job descriptions to reflect the new responsibilities of the team members.
- Provide education and training.
- Establish coordination with the GTIN Operational Team and the GLN Operational Team.

**Tools**

- GDSN presentation materials (prepared in Step 1)
- GDSN announcements from the GS1 Healthcare US Document Library Industry Announcements folder
- 2012 GTIN Sunrise information
- GS1 Healthcare US Webinars
- Seton Family of Hospitals / BD Success Story and other industry use cases from the GS1 Healthcare US Online Document Library GDSN Implementation folder
Step Four: Initiate Education for Advisory Group & Operational Team

The goal in this step is to ensure that the company participants have the proper understanding and knowledge needed to achieve the goals and reach the expected benefits. A base level of knowledge about the GDSN, GS1 Healthcare US, and GS1 Standards is necessary for all active participants.

**Actions**

- Participate in webinars, conferences and GS1 Healthcare meetings.
- Train staff, including marketing, customer relations and sales.
- Train staff utilizing GDSN work teams, both free and fee based.
  - GS1 Healthcare US GDSN Implementation Workgroup
    Meets bi-weekly. Must be a GS1 Healthcare US member to participate.

**Tools**

- GDSN presentation materials *(prepared in Step 1)*
- GDSN announcements from the GS1 Healthcare US Document Library *Industry Announcements* folder
- 2012 GTIN Sunrise information
- GS1 Healthcare US Webinars
- Seton Family of Hospitals / BD Success Story and other industry use cases from the GS1 Healthcare US Online Document Library *GDSN Implementation* folder

Step Five: Select Data Pool, Connect to the GDSN & Establish an Implementation Strategy

The goal in this step is to select a GDSN-certified Data Pool and work with the data pool to register your GTIN and GLN information. As part of this effort, the Team should request your company’s IT staff to evaluate the various technological options for loading data into a data pool, and then advise the Team on their findings. (GDSN on-boarding services are also provided by numerous IT solution providers. If assistance from an IT solution provider is needed, contact your data pool.) The Team should also engage the GLN Operational Team and GTIN Operational Team for support and coordination of effort.

* A list of all GDSN-certified Data Pools in the U.S. is provided in Appendix A of this Tool Kit.

In addition, the Team must identify the tables/databases in the company’s IT systems that rely on product and/or party/location information, and therefore must be synchronized using the GDSN. At a minimum, the Team should consider the tables/databases in the following IT systems: ERP, purchasing, replenishment, contract administration, recall, ebusiness, rebates and chargebacks, classification [i.e., UNSPSC], inventory management, transportation, controlled substances, etc.

**Actions**

- Research GDSN-certified Data Pools to identify the ones that best fit with your organization and needs.
- Select and engage a GDSN-certified Data Pool.
- Engage the GLN Operational Team and GTIN Operational Team for support and coordination of effort.
• Work with the data pool (and on-boarding partner if applicable) to register your GTIN and GLN information.
• Identify any strategic partners you may want to prioritize for synchronization.
• Survey each IT system as to supply chain information needs, and GTIN/GLN use.
• Once the initial survey is finished, it is recommended that the survey findings be re-circulated to the Team for review and validation.
• After completion of the second review and validation, the Group should meet to discuss the results and to identify the first areas/systems in which to implement GDSN data synchronization based on value added benefits.

Step Six: Assess Information Systems

The goal in this step is to ensure that your information systems are ready by making the appropriate system changes required to utilize the GDSN.

Actions

• Meet with your IT system experts (including different disciplines within the IT department), internal and external, to review implementation strategy and understand implications for your information systems. Important things to consider:

  ✓ Assess your organization’s technical portfolio:
    ➢ What system(s) do you have in place today to manage your item and customer data or information?
    ➢ Where are those systems located and who (which department) owns or has access to that information?
    ➢ What business processes do those systems support today? Will those processes or support need to change as a result of your participation in GDSN?
    ➢ Can the item and customer data be extracted in an automated fashion?
    ➢ If data elements are located in disparate systems, can that data be aggregated in an automated fashion?
    ➢ If not, what will it take to build that automation? Are those resources/capabilities in house?

• Document the technical requirements for participating in GDSN with your chosen data pool and assess your organization’s ability to meet those requirements:
  ➢ Do you have the required communication protocol?
  ➢ Do you have the resources to develop the required messaging/data format?
  ➢ Develop a workplan to monitor and provide visibility to the rest of your organization around your progress of meeting GDSN requirements

• Engage your current solution provider(s) as needed.
• Establish a collaborative plan to make the necessary changes and prepare information systems.
Step Seven: Ensure Data is Ready

The goal in this step is to ensure that your data is ready. This step requires close coordination with your company’s GLN Operational Team and GTIN Operational Team to ensure that all locations have been assigned a GLN, all products have been assigned a GTIN, and all data/attributes have been properly defined.

Data Pools can be helpful in readiness a supplier’s data. For example, manufacturers starting with an independent gap analysis may end up assuming that they need to add fields to their MMIS before they can begin working with the data pool and/or using the GDSN. However, some data pools and on-boarding service providers can derive data from other existing fields, thereby avoiding the need to create fields. Therefore, it is a good idea to discuss data readiness options with your data pool and/or solution provider.

Actions

- Select which GLN you want to use for publishing. Coordinate with your company’s GLN Operational Team.
- Coordinate with your company’s GTIN Operational Team to gather all of the GTINs for your products. Confirm that all products have been assigned a GTIN, and that all GTIN product attributes have been properly defined.
- Perform data analysis:
  - Compare GDSN requirements to internal data elements to ensure alignment
  - Analyze data output for accuracy and compliance. Provide feedback to internal teams and adjust output as necessary.
- Ensure data readiness:
  - Meet data requirements of recipient
  - Identify items that are to be sent to desired recipient
- Establish a process to maintain data quality and identify those responsible for maintaining this process.

Tools

- Healthcare Supplier GLN Tool Kit
- Healthcare Supplier GTIN Tool Kit
- List of GTIN Attributes for U.S. Healthcare Products (Appendix B)
- GS1 Data Quality Framework

Step Eight: Develop & Initiate Project Communication

The goal in this step is to inform your internal and external community. Utilize internal communication tools such as newsletters and intranet to introduce the concept and benefits of the GDSN to your company, and external communication tools like websites and customer letters to announce GDSN readiness and implementation to your customers. The Advisory Group member from Public Relations should be enlisted in this effort.

In addition to the Healthcare Supplier Tool Kits, GS1 Healthcare US has prepared Tool Kits for healthcare providers as well. You can consult these tool kits for information about how providers are implementing and benefitting from GS1 Standards. The Healthcare Provider Tool Kits are available at www.gs1us.org/hcptoolkit.

Actions

- Announce company commitment to GDSN (and GS1 Standards) in internal communications like newsletters & other media.
- Announce commitment to implement the GDSN in external communications with your customers and supplier community.

Tools

- GDSN presentation materials (prepared in Step 1)
- GDSN announcements from the GS1 Healthcare US Document Library Industry Announcements folder
- 2012 GTIN Sunrise information
Step Nine: Engage Customers

The goals in this step are to identify the customers with whom your company wishes to synchronize data, and with whom among those customers will you test your GDSN implementation. This is the most important step in this process. What do your customers want? Collaboration and communication with your customers is critical for successful implementation. Now that your company’s GTINs and GLNs are registered in a GDSN-certified Data Pool and an implementation plan has been established, you need to engage strategic customers in a process of communication about your company’s plans.

**Actions**

- Explain implementation and process.
- Determine customer capabilities.
- Determine education and training needs.
- Analyze the impact to your operations and staff.
- Introduce your implementation team to your customers, exchange important information about the location and preparation of data and subscription information, and exchange synchronization plans including your data pool.

**Tools**

- Your GDSN Implementation Plan (created in Step 5 above)

Step Ten: Conduct Testing With Customers

The goal in this step is to successfully exchange data with customers using the GDSN (e.g., have customers subscribe to your GLN(s) and several of your GTINs). At this point, you are ready to conduct tests with your customers. You will be consulting with your GDSN-certified Data Pool for its recommended testing criteria and procedures. The testing process will provide validation of information system capabilities and operational impact. A phased or incremental approach to loading, publishing and synchronizing data with customers is recommended during testing. It is recommended that suppliers first perform this step with their top/key customers. Beyond this, suppliers should follow their normal testing protocol/practices for the introduction of new technologies between partners.

**Actions**

- Document critical success factors.
- Make adjustments as identified.
- Communicate with your customer community about lessons learned & best practices.

**Tools**

- GDSN Implementation Guides (available in the GS1 Knowledge Center)
- GDSN-certified Data Pool implementation materials (to be provided by the data pool you select)
- Global GDSN Healthcare Pilot Report and other industry use cases from the GS1 Healthcare US Online Document Library GDSN Implementation folder
Step Eleven: Make Adjustments to Initial GDSN Implementation Plan

The goal in this step is to review the initial plan and make corrections based on the work group’s experiences and lessons learned. As a result of the testing process, potential adjustments must be made to all aspects of the program, from internal process through communications.

Actions
- Adjust plan to achieve the most benefits, either in terms of supply chain management, financial benefits or both.

Tools
- Your GDSN Implementation Plan (created in Step 8 above)

Step Twelve: Create Standard Operating Procedures

The goals in this step are to document standard operating procedures and obtain sign off, both internally and externally. Following testing and the implementation of the necessary adjustments, it is necessary to prepare standard operating procedures for internal and external staff. The Advisory Group and Operational Team should be heavily involved in this process.

Analyzing the GDSN ROI for Your Company

As with any important project, suppliers need to 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 supplier determine its own return on investment based on individual needs and circumstances. This guidance is provided as a starting point for any company wishing to pursue ROI analysis.

It is good to note that beyond the analysis provided in this section for the ROI of GDSN alone, additional benefits and ROI can be found in the implementation of GDSN as part of the implementation of the full GS1 System of standards, including Global Trade Item Numbers (GTIN) and Global Location Numbers (GLN). (For more information about GTINs and GLNs, please refer to the Healthcare Supplier Tool Kits on those topics.) Moreover, most “early adopter” companies have realized additional value in unanticipated areas like process improvement and infrastructure development. And, many have noted the value of a new “business philosophy” or way of doing business which places the company in an advantageous position to address some of the upcoming challenges anticipated in healthcare over the next few years.

There are various functions and business processes which will be directly impacted and improved through the use of GDSN. These functions and business processes serve as “hot spots” for capturing return on investment of GDSN implementation. There are various functions and business processes which will be directly impacted and improved through the use of GDSN. These functions and business processes serve as “hot spots” for capturing return on investment of GDSN implementation. For example, a joint Accenture study for the retail sector in 2006 identified spot metrics and explained how these targeted metrics could be different for each user of the GDSN. That portion of that study has been adapted and recreated in Table 2 below.
### Table 2: Retail Sector Metrics Excerpted from 2006 Accenture Study*

<table>
<thead>
<tr>
<th>Source of Benefits</th>
<th>Functional Impact</th>
<th>Performance Metrics (Process Area)</th>
<th>% Improvement Over Current State</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Value Chain</td>
<td></td>
</tr>
<tr>
<td>Reduce Costs (Improve Operations)</td>
<td>Reduced inbound &amp; outbound freight costs (Transportation)</td>
<td>6.5%</td>
<td>2 - 8%</td>
</tr>
<tr>
<td></td>
<td>Improved productivity within distribution network (distribution)</td>
<td>1%</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td>Improved DSD receiving capabilities (Store Operations)</td>
<td>9%</td>
<td>Not Available</td>
</tr>
<tr>
<td>Increase Profitability</td>
<td>Improved productivity within order and item administration (Order Administration)</td>
<td>50%</td>
<td>2 - 67%</td>
</tr>
<tr>
<td></td>
<td>Reduced out-of-period adjustments &amp; reconciliation of invoice &amp; coupon discrepancies (Accounting Administration)</td>
<td>8%</td>
<td>Not Available</td>
</tr>
<tr>
<td>Increase Revenue (Grow Business)</td>
<td>New Item Introduction</td>
<td>Reduced time from order entry to shelf (Speed to Market)</td>
<td>23%</td>
</tr>
<tr>
<td></td>
<td>Customer Service</td>
<td>Reduced instances of coupon rejection at store check-out (Customer Support)</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Sales</td>
<td>Reduced time spent addressing item data issues (Sales)</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

“Research identified so many specific “spot” successes that they appear to represent the “tip of the iceberg” of what is possible with [global data synchronization]. Additional organizational savings and revenue growth are sure to follow. Indeed, a key insight of the research is that while benefits from data synchronization are concentrated on the cost side, [global data synchronization] also delivers opportunities to increase revenue…[T]he success with data synchronization touch multiple functional areas throughout an organization.”


In order to support your ROI analysis, a list of ROI hot spots 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.

### Logistics & Distribution

- Inbound and Outbound Freight Costs (Transportation)
- Productivity within Distribution Network (Distribution)
- New Item Introduction
- Speed to Market
- Logistics Expenses
- Warehouse Expenses and Productivity
- Product Delivery Issues to Recipient
- Order Can Not Fit on Truck (cube or weight too high)
- Overpay for Shipping if Truck is Lighter than Previously Determined
- Warehouse Scanning Errors and Storage Issues
Labor Management

In terms of labor management, consider the following before and after GDSN implementation:

- 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
Lessons Learned & Best Practices

The following case studies illustrate lessons learned and best practices for GDSN implementation. Documents can be found in the GS1 Healthcare US Online Document Library in the “Global Data Synchronization Network Implementation” section. (Visit http://www.gs1us.org/healthcare to download.)

- GDSN in Healthcare: Experiences of Early Adopters in the United States Implementation Report
- Seton Family of Hospitals / BD Success Story
- Global GDSN Healthcare Implementation Initiative – Phase 2 Report
- HFMA’s 2005 Supply Chain Benchmarking Survey: Managing Resources to Achieve Improved Economic Outcomes and High-Quality Care
- GDSN Etoile 2007 Report: Lessons Learned -- GDSN and Interoperability
Frequently Asked Questions (FAQs)

What is data synchronization?

Data synchronization is an electronic business process that ensures trading partners’ product databases are kept the same as each other, thus creating a greater opportunity for business efficiency and growth.

Why synchronize data?

Synchronized data eliminates errors in data alignment between a hospital and its suppliers, which creates supply chain information efficiencies, and ensures accurate data in transactions.

Today, healthcare facilities and their vendors, suppliers and GPOs are facing high, unnecessary costs due to master data problems, such as supply chain information inefficiencies and inaccurate data in transactions. Invoices with errors are responsible for a large part of these costs.

In addition, globalization of trade has generated an accelerated need for smooth inter-company flow of goods and better control of supply chain processes, which can be achieved via synchronized communication among trading partners.

By continuously synchronizing/harmonizing the master data, between your system and your suppliers’ systems, you will ensure that master data is the same in all systems. This will allow you to trade globally, increase data accuracy between you and your trading partners, and drive costs out of your supply chain.

What is the Global Data Synchronization Network (GDSN)?

The Global Data Synchronization Network (GDSN) is a network of interoperable data pools and a Global Registry, the GS1 Global Registry, that allows the timely and “auditable” distribution of certified standardized master data (Trade Item and Party) from a data source to a final data recipient of this information.

One of the key advantages of the GDSN is that trading partners have a single point of entry to the GDSN through the certified data pool of their choice, eliminating the need to subscribe to multiple data pools. Trading partners do not have direct access to the GS1 Global Registry, unless they act as their own data pool.

Within the GDSN, Catalog Items are identified by a combination of GTIN, GLN of the data source, and target market (a geographic area where the product is intended to be sold) while Parties are identified using a GLN.

What are the elements of the GS1 Global Data Synchronization Network (GDSN)?

There are three key elements that together make up the GS1 Global Data Synchronization Network (GDSN)

1. GS1 (GDSN) standards – the common language of electronic identification and communication
2. GDSN certified Data Pools – the services that hold and process trading partner data
3. The GS1 Global Registry – a neutral, standards-based directory that facilitates the ongoing synchronization relationships between trading partners
What is a data pool?

Data pools are GDSN-certified electronic catalogs of standardized item data. They serve both as a source and/or recipient of master data, and can be run by a GS1 Member Organization, supplier, customer, exchange or service provider.

To be a GS1 GDSN data pool it is necessary to be GS1 GDSN-certified. This is achieved by passing the GS1 GDSN Interoperability Certification.

The latest list of GDSN-certified Data Pools is always available on http://www.gs1.org/gdsn.

What is the GS1 Global Registry?

The GS1 Global Registry is the central directory for providing Catalog Item uniqueness by the registration of items and parties, facilitating subscription sharing, and helping to establish data pool interoperability.

How does the GDSN work?

The GDSN works via a network of interoperable data pools and the GS1 Global Registry to publish and exchange data among trading partners.

Suppliers and their customers willing to synchronize item, and location (party) data with each other will perform 5 basic steps. Refer to the Implementation section of the GDSN website at http://www.gs1.org/gdsn for the latest information on implementing the GDSN including the five step guide referenced above.

What are the benefits of using the GDSN?

There are many benefits associated with use of the GDSN for users of all sizes. For complete list of industry reports, studies and other literature visit the GDSN website at http://www.gs1.org/gdsn

Why should my company consider implementing the GDSN?

A number of GPOs, providers and healthcare associations in the United States have publicly embraced the adoption of GS1 Standards including the industry’s 2010 GLN and 2012 GTIN Sunrise dates which includes use of the GDSN. For more information visit www.gs1us.org/hcsunrise

GDSN provides standardized, reliable data for effective business transactions in both local and global markets, driving down the costs of the supply chain.

In 2006 Accenture report entitled ‘Synchronization—The Next Generation of Business Partnering’ clearly confirms that companies and organizations are making progress and achieving real results with global data synchronization. In fact, manufacturers and retailers that have collaborated and taken an integrated approach to data synchronization have realized even greater benefits than originally expected. This shows that earlier projections were in fact conservative.

In 2007 the U.S. Department of Defense completed a pilot of the GDSN in healthcare and found that the GDSN is capable of meeting the data needs of U.S. healthcare. Learn more at https://dmmonline.dscp.dla.mil/datasynchronization/dodpilots.asp

More information about the benefits of implementing GDSN is available at http://www.gs1.org/gdsn

Where can I find additional information regarding GDSN?

Additional information is available at http://www.gs1.org/gdsn
Why is the GS1 Global Registry useful?

The GS1 Global Registry provides a central index of the official information sources for Catalog Items and Parties, thereby facilitating the publication and subscription of product and location information among trading partners. Broad scale interoperability is not achievable without a Global Registry. This creates a global single point of truth for product and party data. In addition, the GS1 Global Registry provides the following benefits:

(1) Catalog Item Uniqueness:

- The GS1 Global Registry efficiently guarantees the uniqueness of the Catalog Item (GTIN + GLN + target market) for a particular data source. If this functionality is not available via the GS1 Global Registry service it has the following implications:
  - GTIN, GLN, target market uniqueness cannot be guaranteed.
  - To achieve a global uniqueness check, the source data pool would have to check with all the other data pools in the network (assuming that it knows who they are). This would be grossly inefficient.

(2) Reference to the Source of the Data:

- The GS1 Global Registry service holds the information on the source data pool where the details of the GTIN reside. This data is only held once in the network.
- If this functionality is not available via the GS1 Global Registry service it has the following implications:
  - Each local data pool would need to hold this source reference data for each GTIN, GLN, target market combination, and ensure that the data is kept accurate. This creates added complexity and added cost to all the data pools in the network.
  - Should suppliers of data change their home data pool, every data pool in the network would have to be made aware of this.
  - The one-to-many efficiencies that the GS1 Global Registry enables would be lost.

(3) Data Quality:

- The GS1 Global Registry will only register data from GDSN-certified Data Pools. This ensures that all the data pools in the network are complying with a basic set of validation rules that support data integrity in the system. The GS1 Global Registry service will be the central distributor of the validation requirements developed within the GS1 Global Standards Management Process (GSMP), thus ensuring that all data pools authorized to participate in the network are in receipt of the same rules.
- If this functionality is not available via the GS1 Global Registry subscription service it has the following implications:
  - Each data pool would have to keep a record of GDSN-certified Data Pools and would have to have a mechanism for keeping this data accurate and timely based on information that would need to be maintained at GDSN Inc. This would add complexity and cost to GDSN Inc., data pools, and the certification service.

(4) Subscription Data Router:

- The GS1 Global Registry stores information about who has subscribed to Catalog Item or Party data. This data is only held for the purpose of acting as a facilitator of the synchronization process. Data pools receive subscriptions based on a match of the Catalog Item or Party data registered with the GS1 Global Registry.
- If this functionality is not available via the GS1 Global Registry subscription service it has the following implications:
  - Any time a data pool enters or leaves the network, all subscriptions held locally would have to be re-directed by the local data pool. This would add complexity and cost to all data pools and their users.
  - The publication / subscription model used by the GDSN would become much more complex.
What entity operates the GS1 Global Registry?

The GS1 Global Registry is managed and operated by GDSN, Inc. with direction of the GDSN, Inc. Board of Directors.

Is there more than one Global Registry for GDSN?

No, there is only one Global Registry, the GS1 Global Registry, for the GDSN.

Who can access the GS1 Global Registry?

Access to the GS1 Global Registry is limited to data pools that are certified as being compliant with the GS1 GDSN standards, are identified by a Global Location Number (GLN), and have executed a GS1 Global Registry Service Level Agreement.

How does a provider get access to the GS1 Global Registry subscription services?

In order to participate in the Global Data Synchronization Network (GDSN) and register or subscribe to items in the GS1 Global Registry, trading partners must use a GDSN-certified Data Pool. A certified data pool is one that complies with GS1 Standards and has been tested for interoperability within GDSN. Only trading partners using a certified data pool will be able to synchronize data through the GDSN. The list of organizations that offer a certified data pool service can be found through the following link:

http://www.gs1.org/docs/gdsn/gdsn_certified_data_pools.pdf

Where can I find more information on the GS1 Global Registry?

Additional information is available in the GDSN revised roadmap (v.7.1) at the following link http://www.gs1.org/gdsn/ds/library under ‘Basic Resources’. Technical information regarding the GS1 Global Registry and the GDSN is available on the GDSN website at http://www.gs1.org/gdsn/ds/library under ‘Technical Resources’.

How do Small and Medium Size Enterprises (SMEs) join the GDSN?

All companies and organizations are expected to join the GDSN in the same way.

Most data pools provide appropriate support to SMEs’ needs.

If you have a limited number of item and party data to share with your trading partners, you will, most likely, access your third party data pool using a Graphic User Interface (GUI). This interface (i.e. web-based) will allow you to enter data directly into the GDSN-certified Data Pool of your choice and to synchronize automatically with your trading partners should you add, change or delete your item or party data.

What is the connection between the Global Data Synchronization Network (GDSN) and the Electronic Product Code™ (EPC)?

The GDSN uses GS1 System standards to validate the data using GDSN standards, global attributes and business validation rules and provides integrity of data in the network and assures it is genuine if validated against the brand owner information. The Electronic Product Code (EPC) uses Radio Frequency Identification (RFID) and provides the information about the exact location of a product in the system or across the supply chain. Both systems allow for the use of the GS1 Company Prefix as a primary identification through the use of GTIN, GLN, and EPC. For more information visit the GDSN, Inc. website at http://www.gs1.org/gdsn or EPCglobal at http://www.gs1.org/epcglobal
What is a Global Product Classification (GPC)?

A set of common categories to group products globally, developed, owned and used by the GS1 user community. GPC indicates what kind of product the trade item is and to which group of products it belongs. In the GDSN, every GTIN must be classified using a GPC code.

What is the Global Data Dictionary (GDD)?

A repository for all GS1 data attributes, allows users to store, reuse and share precise entry names and business definitions and their equivalent representations for GS1 System standards such as Electronic Data Interchange (EDI), Extensible Markup Language (XML), and Automated Identification and Data Capture Codes (AIDC).
## Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Glossary Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attribute</td>
<td>A piece of information reflecting a characteristic of the object to which an identification number (i.e., GLN, GTIN, etc.) relates.</td>
</tr>
<tr>
<td>Barcode</td>
<td>A precise arrangement of parallel lines (bars) and spaces that vary in width to represent data.</td>
</tr>
<tr>
<td>Company Number</td>
<td>A number allocated by the GS1 Numbering Organization. It is combined with the GS1 Prefix (for the GS1 Member Organization) to create the GS1 Company Prefix. The GS1 Company Prefix (i.e., the GS1 Prefix + the Company Number) uniquely identifies a supplier.</td>
</tr>
<tr>
<td>Data Carrier</td>
<td>A physical or electronic mechanism that carries data (e.g., a barcode or RFID tag).</td>
</tr>
<tr>
<td>Data Standard</td>
<td>The entirety of all GS1 System data standardized in meaning and structure.</td>
</tr>
<tr>
<td>Electronic Commerce</td>
<td>A method of business communications and management using electronic methods, such as electronic data interchange and automated data collection systems.</td>
</tr>
<tr>
<td>Electronic Data Interchange (EDI)</td>
<td>The computer-to-computer exchange of structured information, by agreed message standards, from one computer application to another by electronic means and with a minimum of human intervention.</td>
</tr>
<tr>
<td>GDSN</td>
<td>Acronym for the GS1 Global Data Synchronization Network (defined below).</td>
</tr>
<tr>
<td>Global Data Synchronization Network</td>
<td>An Internet-based, interconnected network of interoperable data pools and a global registry (i.e., the GS1 Global Registry) that enables companies around the world to exchange standardized and synchronized supply chain data with their trading partners.</td>
</tr>
<tr>
<td>GLN</td>
<td>Acronym for the GS1 Global Location Number (defined below).</td>
</tr>
<tr>
<td>Global Location Number</td>
<td>The globally unique GS1 System identification number for legal entities, functional entities, and physical locations. The GLN is 13 digits, comprised of a GS1 Company Prefix, Location Reference, and Check Digit. Supply side trading partner locations generally include corporate headquarters, regional offices, warehouses, plants, and distribution centers. Demand side trading partner locations generally include corporate headquarters, divisional offices, stores, and distribution centers.</td>
</tr>
<tr>
<td>Global Trade Item Number</td>
<td>The globally unique GS1 System identification number for products and services. A GTIN may be 8, 12, 13, or 14 digits in length, represented as GTIN-8, GTIN-12, GTIN-13, and GTIN-14 respectively.</td>
</tr>
<tr>
<td>GS1 Company Prefix</td>
<td>A globally unique number assigned to companies/organization by GS1 Member Organizations to create the identification numbers of the GS1 System. It is comprised of a GS1 Prefix and a Company Number.</td>
</tr>
<tr>
<td>Term</td>
<td>Glossary Definition</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>GS1 System</td>
<td>The specifications, standards, and guidelines administered by GS1. GS1, through the Global Standards Management Process, manages the GS1 System to maintain the most implemented standards in the world.</td>
</tr>
<tr>
<td>GTIN</td>
<td>Acronym for the GS1 Global Trade Item Number (defined above).</td>
</tr>
<tr>
<td>Identification Number (ID)</td>
<td>A numerical designation that uniquely identifies an object in the supply chain. Identification numbers are used to retrieve information previously exchanged between trading partners and stored in their computer database files.</td>
</tr>
<tr>
<td>Party</td>
<td>A Party (or location) is any legal, functional or physical entity involved at any point in any supply chain and for which there is a need to retrieve pre-defined information. A Party is uniquely identified by a Global Location Number (GLN).</td>
</tr>
<tr>
<td>Supply Chain Partner</td>
<td>A party to transactions in the supply chain, such as a supplier (seller) or a customer (buyer).</td>
</tr>
<tr>
<td>Trade item</td>
<td>Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced or ordered or invoiced at any point in any supply chain.</td>
</tr>
<tr>
<td>U.P.C. symbol</td>
<td>A barcode symbol that encodes the GTIN-12, Coupon-12, RCN-12, and VMN-12.</td>
</tr>
</tbody>
</table>
References

- **GDSN Implementation Workgroup**
  To learn more about the GDSN workgroup, contact GS1 US at GS1HealthcareUS@gs1us.org

- **GDSN Implementation Guides are available in the GS1 Standards Knowledge Center**
  http://www.gs1.org/gsmp/kc/gdsn

- **GDSN-certified Data Pools**
  http://www.gs1.org/docs/gdsn/gdsn_certified_data_pools.pdf

- **GTIN Allocation Rules for the Healthcare Sector**

- **GTIN Attributes for Healthcare Interactive Spreadsheet**

- **Sample GTIN Attribute Data for GDSN**

- **GS1 Global Data Dictionary (GDD)**
  http://gdd.gs1.org/gdd/public/

- **GDSN Package Measurement Requirements**
  http://www.gs1us.org/resources/standards/package-measurement-standards

- **GS1 Data Quality Framework Including the Data Quality Protocol**
  http://www.gs1.org/gdsn/dqf/data_quality_framework

- **Online Healthcare Supplier Tool Kits**
  http://www.gs1us.org/industries/healthcare/tools-and-resources/healthcare-tool-kits

- **Standardization …Stat! Industry Awareness Video**
  http://www.gs1ushealthvideo.com/

- **Industry Sunrise Dates**
  http://www.gs1us.org/industries/healthcare/standards-and-initiatives/industry-sunrise-dates
Improving Patient Safety and Supply Chain Efficiency

- The Case for Global Data Standards in the Healthcare Supply Chain

- HFMA's 2005 Supply Chain Benchmarking Survey: Managing Resources to Achieve Improved Economic Outcomes and High-Quality Care
  http://www.hfma.org/WorkArea/linkit.aspx?LinkIdentifier=id&ItemID=18013

- Synchronization - The Next Generation of Business Partnering: How Leading Companies are Delivering Actual Results.

- Global Data Synchronisation At Work in the Real World - Illustrating the Business Benefits.
  http://www.gs1.org/docs/gdsn/gdsn_gci_capgemini_report.zip

- Seton Family of Hospitals / BD Success Story

- GDSN in Healthcare: Experiences of Early Adopters in the United States Implementation Report

- Global GDSN Healthcare Implementation Initiative – Phase 2 Report


- GDSN Etoile 2007 Report: Lessons Learned -- GDSN and Interoperability

- GS1 Healthcare US Website
  https://www.gs1us.org/healthcare

- GS1 Healthcare US Tools & Resources
  http://www.gs1us.org/industries/healthcare/tools-and-resources/resources

- GS1 Healthcare US Webinars
  http://www.gs1us.org/industries/healthcare/education
Appendix A: GDSN-certified Data Pools in the U.S.

The following is a list of GDSN-certified Data Pools operating in the U.S. as of the date of this publication. GDSN-certification of data pools is a formal process. For a complete list of current GDSN Certified Data Pools, please visit this link-  http://www.gs1.org/docs/gdsn/gdsn_certified_data_pools.pdf

Table 2: List of GDSN-certified Data Pools in the United States

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>DATA POOL NAME</th>
<th>CONTACTS</th>
<th>ADDRESS</th>
<th>WEBSITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1SYNC™</td>
<td>Item Management Release 6.2.2</td>
<td>Harris Diamand</td>
<td>1009 Lenox Drive Suite 202</td>
<td><a href="http://www.1sync.org">www.1sync.org</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1SYNC Community Development 609.620.8053</td>
<td>Lawrenceville, NJ 08648</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:hdiamand@1sync.org">hdiamand@1sync.org</a></td>
<td>10 S. Riverside Plaza Suite 2000</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chicago, IL 60606 USA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><a href="http://www.1sync.org">www.1sync.org</a></td>
<td></td>
</tr>
<tr>
<td>Commport Communications International, inc.</td>
<td>CGS datapool services v2.1 release 1.0</td>
<td>Mike Dunbar Director of Sales 905 727 6782 ext 2208 <a href="mailto:MikeD@commport.com">MikeD@commport.com</a></td>
<td>5 Scanlon Court Aurora Ontario, Canada, L4G 7B2</td>
<td><a href="http://www.commport.com">www.commport.com</a> <a href="http://www.cgsdatapool.com">www.cgsdatapool.com</a></td>
</tr>
<tr>
<td>Edgenet</td>
<td>Product Registry v2.1</td>
<td>Zac Garrison Manager of Data Acquisition 262.953.8132 <a href="mailto:zgarrison@bighammer.com">zgarrison@bighammer.com</a></td>
<td>N16 W23233 Stone Ridge Dr. Suite 270 Waukesha WI 53188 USA</td>
<td><a href="http://www.edgenet.com">www.edgenet.com</a></td>
</tr>
<tr>
<td>FSE Inc.</td>
<td>FSEnet+ Data Pool v1.0</td>
<td>Keitt Moore Vice President of Bus. Dev. 617.340.3930 <a href="mailto:keitt@fsenet.com">keitt@fsenet.com</a></td>
<td>77 Rumford Ave Suite 3 Waltham, MA 02453</td>
<td><a href="http://www.fsenet.com">www.fsenet.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hugh McBride Chief Operating Officer 617.340.2068 <a href="mailto:hugh@fsenet.com">hugh@fsenet.com</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>iTradeNetwork, Inc.</td>
<td>ITN_GDS (ITN Global Data Services) V1.1</td>
<td>ITN Global Data Services 925.660.1112 <a href="mailto:sales@itradenetwork.com">sales@itradenetwork.com</a></td>
<td>5959 W. Las Positas Blvd Pleasanton, CA 94588</td>
<td><a href="http://www.itradenetwork.com">www.itradenetwork.com</a></td>
</tr>
<tr>
<td>COMPANY</td>
<td>DATA POOL NAME</td>
<td>CONTACTS</td>
<td>ADDRESS</td>
<td>WEBSITE</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-------------------------</td>
<td>-----------------------------------</td>
<td>------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>GHX</td>
<td>GHX Health ConneXion™</td>
<td>MJ Wylie</td>
<td>1315 W. Century Drive</td>
<td><a href="http://www.ghx.com">www.ghx.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>303-961-7050</td>
<td>Louisville, CO 80027</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:mjwylie@ghx.com">mjwylie@ghx.com</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SA2 Worldsync GmbH (formerly Agentrics)</td>
<td>Gensync v5.0 &amp; SINFOS v2.1</td>
<td>N. America &amp; Asia: Gina Baker 703.234.5215 <a href="mailto:gbaker@sa2worldsync.com">gbaker@sa2worldsync.com</a></td>
<td>N. America &amp; Asia: 4601 Presidents Drive Suite 235 Lanham, MD 20706, USA</td>
<td><a href="http://www.sa2worldsync.com">www.sa2worldsync.com</a></td>
</tr>
<tr>
<td>SA2 Worldsync GmbH (formerly SINFOS GmbH)</td>
<td></td>
<td>Europe: Lorraine Knight +44 199 383 0366 <a href="mailto:lknight@sa2worldsync.com">lknight@sa2worldsync.com</a></td>
<td>Corporate &amp; European Headquarters: Maarweg 149-161 D 50825 Köln, Deutschland</td>
<td></td>
</tr>
</tbody>
</table>

An up-to-date list of GDSN-certified data pools can be found at any time on the GDSN website at: http://www.gs1.org/sites/default/files/docs/gdsn/gdsn_certified_data_pools.pdf
Appendix B: GDSN Attributes recommended for U.S. Healthcare Products

1. GTIN
2. Trade Item Unit Descriptor
3. Information Provider of Trade Item Name/GLN
4. Target Market Country Code
5. Brand Name
6. Classification Category Code
7. Is Trade Item an Orderable Unit?
8. Is Trade Item a Base Unit
9. Additional Trade Item Identification Type/Value
10. Parent GTIN
11. Child GTIN
12. Manufacturer Name/GLN
13. Additional Trade Item Description
14. Net Content +UoM
15. Total Quantity of Next Lower Level Trade Item / Quantity of Children
16. Does Label Indicate this Product Contains Latex?

There is a downloadable spreadsheet of all of the GTIN attributes for healthcare products available online. The spreadsheet has several useful tabs. Navigation among the tabs is set up to be user friendly. For the link to the GTIN attributes for healthcare products spreadsheet, please refer to the References section of this document.
Appendix C: GDSN Mandatory Attributes which can be defaulted if actual values are not available for U.S. Healthcare Products

1. Functional Name
2. Height +UoM
3. Width + UoM
4. Depth + UoM
5. Is Trade Item a Consumer Unit?
6. Is Trade Item an Invoice Unit?
7. Is Trade Item a Despatch Unit?
8. Is Trade Item a Variable Unit?
9. Is Packaging Marked Returnable?

*Use the Default values below to populated GDSN Mandatory Attributes when there is no Actual Value

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Functional Name</strong></td>
<td>Value- “Default”</td>
</tr>
<tr>
<td></td>
<td>(Unless actual values are populated)</td>
</tr>
<tr>
<td><strong>Height, Width, Depth</strong></td>
<td><strong>0.001</strong></td>
</tr>
<tr>
<td></td>
<td>(unless actual value needed)</td>
</tr>
<tr>
<td><strong>Is Trade Item a Consumer Unit?</strong></td>
<td>Value- “FALSE”</td>
</tr>
<tr>
<td><strong>Is Trade Item an Invoice Unit?</strong></td>
<td>(unless actual value needed)</td>
</tr>
<tr>
<td><strong>Is Trade Item a Despatch Unit?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Is Trade Item a Variable Unit?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Is Packaging Marked Returnable?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Product Range</strong></td>
<td>Value- &quot;INDICATORS DEFAULTED&quot;</td>
</tr>
<tr>
<td></td>
<td>(Only populated when the Indicators listed here contain default values and NOT actual values)</td>
</tr>
</tbody>
</table>
### Appendix D: GDSN Attributes which can optionally be provided for U.S. Healthcare Products

1. Has Batch Number? Is Non Sold Trade Item Returnable?
2. Brand Owner Name/GLN
3. Gross Weight +UoM
4. Barcode Type
5. Additional Classification Agency Name, Category Code, Category Code Version, Category Description
6. Start Availability Date Time
7. Effective Date
8. Minimum Trade Item Lifespan from Time of Production
9. Minimum Trade Item Lifespan from Time of Arrival
10. Healthcare Trade Item Reusability Information
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IAPMO

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