Healthcare Provider Tool Kit
Global Data Synchronization Network® (GDSN®)

Improving Patient Safety and Supply Chain Efficiency
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Executive Summary

The purpose of this document is to provide guidance to healthcare providers about the need for a central source of supply chain information (and eventually select clinical information as well) they can use to feed all of their systems with reliable 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 patient safety and supply chain management are discussed, and guidance for assessing GDSN ROI for your organization is included as well. Finally, this document provides detailed steps for implementing the GDSN in your organization.

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 reliable supply chain information in order to support patient safety and supply chain business processes. And, using this document, you will learn how to get that effort underway today!
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.
Improving Patient Safety and Supply Chain Efficiency

Introduction to Standards

Trading partners in the healthcare supply chain need to share many and complex pieces of data in order to transact business and support their work. For example, manufacturers and distributors need to communicate product information and company location, and hospitals need to share location information. In order to be efficient and effective in that effort, a common language and globally accepted standards are essential. Without such standards, supply chain partners face high, unnecessary costs due to inaccurate data and supply chain information inefficiencies.

Unfortunately, the healthcare industry has experienced the harsh reality of this lesson. In the first comprehensive analysis of this topic in 1996, the Efficient Healthcare Consumer Response study 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. Worse yet, a groundbreaking report on patient safety issues by the Institute of Medicine in 1999 cited staggering statistics about medical error, and found that hand written reports or notes, manual order entry, non-standard abbreviations and poor legibility lead to substantial errors and injuries. Those findings and conclusions were reinforced five years later when the authors of that groundbreaking report revisited the status of the healthcare system and once again echoed their findings of widespread systemic problems.

In response, a movement has been building in the healthcare supply chain to adopt and implement data standards to support patient safety and improve supply chain management. A growing number of companies, hospitals and healthcare organizations have chosen the GS1 System to help them improve collaboration with their supply chain partners. 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.

Why Are Standards Necessary?

Healthcare providers need to communicate product and location information with their supply chain partners, and with the various sites and departments within their own enterprise. Without a common language and globally accepted standards, healthcare providers, companies and/or industry associations are left to develop their own identifiers and data formats, resulting in numerous proprietary "standards" for healthcare providers and companies to manage. However, as discussed in the Efficient Healthcare Consumer Response study, this is the cause of billions of dollars of waste in the healthcare industry. Moreover, the existence of numerous "standards" causes supply chain inefficiencies and inaccurate data that inserts cost and confusion into healthcare business processes, threatening quality of care and patient safety.

This is why global standards are so important. Global standards provide simplicity and consistency by promoting universal applicability and optimal functionality across the globe for all industry sectors. In today’s complex markets, supply chain lines are blurring and channels of distribution for various sectors are overlapping.

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Improving Patient Safety and Supply Chain Efficiency

This is especially true of the healthcare industry where manufacturers of healthcare products often supply both hospitals and consumer goods retailers; 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 that can be used by all supply chain partners, independent of industry sector or location, are essential in this environment.

Global standards support healthcare business processes and can bring about many benefits for patient safety and supply chain management, such as:

- Reduction in medication errors through efficient automatic 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 process
- More efficient receiving
- Reduced inventory
- Increased productivity in business processes
- Improved shelf management
- Improved service levels/fill rate
- Improved management of manufacturing/supply cost
- Elimination of the need for re-labeling and proprietary codes
- Supports regulatory compliance

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, class of trade, etc.) help users to ensure that each GLN is specific to one, very precise 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 attributes defined for each GTIN (e.g., size, weight, packaging, etc.) help users to ensure that each GTIN is specific to one, very precise trading unit configuration (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.

How Do the GS1 Standards Relate to Each Other?

GS1 Identification Numbers provide the link between an object and the information pertaining to it. When a user assigns 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, etc.). 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 UNSPSC product classification. Standardized attributes about commercial entities include core data like location information about a warehouse or hospital. Once defined by the user, those attributes are then stored in a GDSN-certified Data Pool and shared with supply chain partners using the GDSN. Through this process, GS1 Identification Numbers not only identify an object, but also provide a link to information about that object.

That linkage is tremendously valuable. In fact, twenty-three industry sectors have used GS1 GTINs, GLNs 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, healthcare providers can lay the foundation for a wide range of solutions to enhance patient safety and supply chain management within their facilities and across their organizations, as demonstrated in the illustration below.

As shown, patient safety and supply chain efficiency are the ultimate goals (shown as the roof of the house). There are numerous and ever-evolving tools to support providers in improving patient safety and supply chain management (shown as the pillars supporting the roof). However, in order to work, those applications must be
built on a strong foundation. This is where the standards come into play. Standardized product identification, standardized location identification and standardized product definitions (shown as the foundation of the house) provide the foundation for developing the tools and applications that healthcare providers use to improve patient safety and supply chain management.

**Figure 1: Building Patient Safety**
**Problem:** Supply chain partners use different Organization and Location IDs.
**Example:** Manufacturer uses GLN. Distributor uses DUNS number. Hospital uses its own proprietary identification system. This causes rebates and claims to be misapplied and/or lost, and frustrates direct deliveries in the facility.

**Healthcare Industry Solution:** Global Location Number (GLN)

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**Problem:** The same product has different identification numbers assigned to it.
**Example:** Nearly every hospital has a different Product ID for 3M Item #8630 -- making proper product identification, ordering and recalls difficult.

**Healthcare Industry Solution:** Global Trade Item Number (GTIN)

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**Problem:** The same identification number is assigned to different products.
**Example:** “Part Number 10313” refers to several different manufacturers/items. This increases errors in ordering and distribution to patients, and makes sourcing of needed products difficult.

**Healthcare Industry Solution:** Global Trade Item Number (GTIN)

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**Problem:** There is no standard for unit of measure and no distinct identifier for different product packaging levels.
**Example:** You may order “50” and receive 500 because they are sold in units of 10, or you may order 20 “cases” and receive 20 “boxes.” This results in inventories of wrong products and increased returns processing, driving up costs and creating cash flow issues.

**Healthcare Industry Solution:** GTIN Allocation Rules for Product Hierarchy and Package Measurement

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**Problem:** There is no central source of party/location and product information.
**Example:** The numerous systems across the healthcare facility (e.g., inventory systems, billing/accounts payable, Barcode Point of Care (BPOC) systems, prescription drug systems, etc.) each have their own database. This is a problem because there is no way to ensure that the information used in one system is the same as the information used in another.

**Healthcare Industry Solution:** Global Data Synchronization Network (GDSN)

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**Problem:** No standards for classifying or grouping products in order to analyze spending activities.
**Example:** Providers need to manage their purchasing volume with suppliers in order to achieve the best pricing for which the hospital is eligible. However, most provider systems are not structured to provide insight into purchasing activities and patterns based on product categories, products and/or vendors.

**Healthcare Industry Solution:** United Nations Standard Products & Services Code (UNSPSC)
The Case for the Global Data Synchronization Network™ (GDSN®)

The Problem: Lack of Reliable Information

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 location 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 patient safety and supply chain management. In fact, the use of inaccurate supply chain information costs the healthcare industry billions of dollars annually. Consider the following:

- 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 hospital 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.
- 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%.

The problem is two-fold. First, healthcare providers need one central source of supply chain information that all systems in the organization rely on for information about products and supply chain partners. Secondly, healthcare providers need a process for ensuring that the information in that central source is reliable, accurate, properly formatted, and up-to-date.

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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 reliable product and party/location information within an organization and across supply chains. The GDSN enables healthcare providers to establish one, authoritative source of supply chain information from which all systems in the organization can pull information about products and supply chain partners. In addition, the GDSN empowers healthcare providers with a highly efficient automated process for ensuring that the information in that central source is reliable, accurate, properly formatted, and up-to-date. With the GDSN, providers can finally establish one authoritative source of product and party/location information to feed all of their systems with the same reliable information used by all of their vendors and supply chain partners.

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

| GDSN-certified Data Pools | The GS1 Global Registry maintains the data pool location of each GTIN and GLN in the GDSN. It is now the GDSN knows where GLN and GTIN information can be found.
|:--------------------------|:--------------------------------------------------------------------------------------------------------------------------|
| GDSN-certified Data Pools | 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.
| GS1 Global Registry      | 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. |
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.

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

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/or locations, and the Global Trade Item Number (GTIN) for information about products. (For more information about GLN and GTIN, please refer to the Healthcare Provider Tool Kit for each of those topics.)

Healthcare providers assign GLNs to their various locations and entities.

Healthcare suppliers assign GLNs to their locations and entities, as well as GTINs to all of their products.

Both providers and suppliers assign their own identifiers (i.e., GLNs and/or GTINs) based on GS1 Standards, and then define the information (known as attributes) about the product/location to which the identifier relates (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. (A list and description of all of the GTIN attributes for U.S. healthcare products are provided in the appendices 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 providers at a high level. At that level, healthcare providers should simply think of the GDSN as the tool for establishing a central, authoritative source of reliable supply chain information. For those interested in more information about how the GDSN works, this section provides a few more details. However, providers 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 data pool.
Authoritative Data Sources

GDSN-certified Data Pools serve as standards-based repositories for party/product information. A list of all GDSN-certified Data Pools in the U.S. is provided in Appendix A of this document.

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

As noted above, the data pool not only stores the provider’s GLN information, but also stores the GLN and GTIN information the provider needs about its supply chain partners. All of that information is obtained by the GDSN-certified Data Pool through a process known as the publication-subscription process. Through their GDSN-certified Data Pools, the provider submits a “subscription request” for a vendor’s GLNs/GTINs, and the vendor “authorizes” their data pool to publish the information to that provider.

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 locations.
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 an organization are using the same, reliable data.

Figure 5: GDSN Data Synchronization – manufacturer revised information for one of its GTINs

[Diagram showing GDSN data synchronization process]
Advantages of Using the GDSN in the Healthcare Supply Chain

With the GDSN, providers can finally establish one central source of product and party/location information they can use to feed all of their systems with the same reliable information that is used by all of their supply chain partners. In addition, the GDSN empowers healthcare providers with a highly efficient automated process for ensuring that the information in that central source remains reliable, accurate, properly formatted, and up-to-date.

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, suppliers and distributors in other industries are already successfully using the GDSN. In fact, the GDSN has over 15,000 subscribers worldwide, with information on 2.5 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 Data 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 Providers

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 healthcare providers to ensure that all of their systems are using reliable, up-to-date information about all of the various products used in their facilities. In addition, the GDSN empowers healthcare providers with a highly efficient, automated process for maintaining the reliability and accuracy of that information. This translates to significant benefits for patient safety and supply chain management.

Patient Safety Benefits

Caregivers need the right products, in the right location, at the right time to ensure the proper patient treatment. The GDSN supports that effort by facilitating the dissemination of reliable product information throughout the hospital (or healthcare facility) and among supply chain partners. 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.

Supply Chain Benefits

The GDSN facilitates communication of accurate product information among supply chain partners. In addition, it enables healthcare providers to efficiently and effectively manage information about all of the various products used in their healthcare facilities. This promotes more efficient business practices and helps to drive down supply chain costs for both healthcare providers and suppliers. As a result, there are many supply chain benefits to using the GDSN:

- **Reduced labor costs**: Use of the GDSN frees staff time by eliminating the need to manually update product and partner information across all hospital IT systems whenever such information is updated by a supply chain partner.
- **Improved supply chain management**: Use of the GDSN strengthens business communications among supply chain partners by increasing accuracy from the ordering process to payment. This results in fewer invoice disputes, fewer ordering mistakes, and improved fill rates.
- **Enhanced inventory management**: The GDSN supports GPOs, distributors and providers in matching product information faster and more accurately, helping providers to reduce costs and make faster decisions such as when to move to another order quantity tier to realize additional savings (e.g., bulk purchases).
Implementing the GDSN in Your Organization

So, what exactly does it take to begin using the GDSN in your organization? 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 supplier involvement, and establishing standard operating procedures.

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 standards adoption and the need for industry-wide implementation, and to obtain executive approval to proceed with GDSN implementation. As with any project that will impact the business processes of the organization, 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.
- 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 materials from the GS1 Healthcare US Website
- GDSN materials from the GS1 Healthcare US Document Library

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 facility priorities. Formation of a multi-disciplinary 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. The Group should include:
  - Financial Controller
  - Legal Counsel
  - Supply Chain
  - Information Systems (business & operational)
  - Accounts Payable
  - Public Relations (internal)
  - Group Purchasing Representative
  - Primary Distributor Representative
  - Pharmacy Head
  - Nursing/Clinicians
  - Clinical Engineering

**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.
- 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 materials from the GS1 Healthcare US Website
- GDSN materials from the GS1 Healthcare US Document Library
- GS1 Healthcare US Webinars

Step Four: Develop & Initiate Project Communication

The goal in this step is to inform your internal and external community. Utilize internal communication tools such as newsletters, intranet, websites and vendor letters to introduce the concept of the GDSN to your organization, including the supplier community. The Advisory Group member from Public Relations should be enlisted in this effort.

**Actions**

- Announce organizational commitment to GDSN (and GS1 Standards) in newsletters and other media.
- Announce commitment to implement the GDSN to your supplier community.

**Tools**

- GDSN presentation materials (prepared in Step 1)
- GDSN materials from the GS1 Healthcare US Website
- GDSN materials from the GS1 Healthcare US Document Library
- Sample letters for providers to suppliers re: GDSN implementation (see the References page for link)
Step Five: Initiate Education for Advisory Group & Operational Team

The goal in this step is to educate participants. A base level of knowledge about the GDSN, GS1 Standards and GS1 is necessary for all active participants.

**Actions**

- Participate in webinars.
- Train staff.

**Tools**

- GDSN presentation materials *(prepared in Step 1)*
- GDSN materials from the GS1 Healthcare US Website
- GDSN materials from the GS1 Healthcare US Document Library
- GS1 Healthcare US Webinars

Step Six: Assess Information System Issues

The goal in this step is to evaluate the readiness of your information systems, and make the appropriate system changes required to utilize the GDSN. The capability of your information system to utilize the GDSN must be assessed, and the necessary changes made. To support you in that effort, we have prepared a scorecard to help you assess your hospital’s IT capabilities readiness for the GDSN.

**Actions**

- Meet with your IS system experts *(including different disciplines within the IS department)*, internal and external, to review implementation strategy and understand implications for your information systems.
- Establish a collaborative plan to make the necessary changes and prepare information systems.

**Tools**

- GDSN Implementation Guides (available in the GS1 Knowledge Center)
- GDSN Integration Readiness Scorecard
Step Seven: Gather the Needed GTIN and GLNs

The goal in this step is to assemble all of the GLNs and GTINs you need from your organization and from your supply chain partners. This step requires close coordination with your organization’s GLN Operational Team and GTIN Operational Team, as well as your supply chain partners, who may already have gathered much of the needed information.

**Actions**

- Coordinate with your organization’s GLN Operational Team to gather all of the GLNs for your organization.
- Coordinate with your organization’s GTIN Operational Team to generate a list of all of your suppliers. You may want to prioritize this list based on the number of products each vendor supplies to your organization.
- Work with your GTIN Operation Team and your suppliers (i.e., your sales agents or representatives) to assure that you are subscribed all of the GTINs for each of the products used/purchased at your facility from each supplier.
- Contact manufacturers, distributors, and/or suppliers for their GLNs.

Step Eight: Establish Implementation Strategy

The goal in this step is to select a GDSN-certified Data Pool and work with them to establish a GDSN implementation strategy and plan. The Team will work with the data pool to register your GLN information, and subscribe to your suppliers information. As part of this effort, the Team should request the hospital’s IT staff to evaluate the various technological options for loading data onto 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.

ℹ️ 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 determine the tables/databases in the hospital’s IT systems that rely on product and/or party/location information, and therefore must be synchronized using GDSN. At a minimum, the Team should consider the tables/databases in the following IT systems: purchasing, replenishment, recall, ebusiness, rebates and chargebacks, classification (UNSPSC), inventory management, transportation, controlled substances, vendor scorecard, payer systems (e.g., Medicare), patient records, etc.

**Actions**

- Research GDSN-certified Data Pools.
- Select 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 GLN information, and subscribe to your suppliers’ information.
- 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 patient safety, value added benefits, or both.
Step Nine: Engage Suppliers

The goals in this step are to prepare the supplier community and identify partner(s) for testing. Collaboration and communication with your supplier community is critical for successful implementation. So, now that an implementation plan and initial database have been established, you need to engage strategic suppliers in a process of communication about your facility’s plans.

**Actions**

- Explain implementation and process.
- Determine supplier capabilities.
- Analyze the impact to your operations and staff.
- Introduce your implementation team to your suppliers, exchange important information about the location and preparation of data and subscription information, and exchange synchronization plans.

**Tools**

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

Step Ten: Conduct Testing With Suppliers

The goal in this step is to successfully exchange data with suppliers using the GDSN (e.g., subscribe to a few of each others’ GLNs and GTINs). At this point, you are ready to conduct tests with your suppliers, manufacturers and/or distributors. You will be consulting with your GDSN-certified Data Pools for their recommended testing criteria and procedures. The testing process will provide validation of information system capabilities and operational impact. It is recommended that providers first perform this step with their top/key suppliers.

**Actions**

- Document critical success factors.
- Make adjustments as identified.
- Communicate with your supplier 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 scanning through communications.

**Actions**

- Adjust plan to achieve the most benefits, either in terms of supply chain management, patient safety, financial benefits, or all of the above.

**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 Organization

In today’s dynamic healthcare environment of declining reimbursement and a reduced labor pool, healthcare organizations have expressed a need to establish a return on investment (ROI) for the use of GDSN. Indeed, demonstration of positive ROI for GLN supports organizations challenged daily by the allocation of scarce resources. This section provides guidance to help each organization determine its own return on investment based on individual needs and circumstances. This guidance is provided as a starting point for any organization 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 Provider Tool Kits on those topics.) Moreover, most “early adopter” organizations 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 organization in an advantageous position to address some of the upcoming challenges anticipated in healthcare over the next ten years.

Levels, Readiness and Impacts Model (LRIM)

Center for Innovation in Healthcare Logistics (CIHL) at the University of Arkansas engaged in a Data Standards implementation project with a number of industry partners and provider sites to understand the costs, barriers and opportunities providers can expect in GS1 standards adoption. Together, they designed the Levels, Readiness and Impacts Model (LRIM). The LIRM is designed to provide a user-friendly, Excel-based spreadsheet tool to help providers meet their need to quantify the investments and benefits they can expect from GS1 adoption choices. LRIM does not attempt to estimate dollar costs and benefits. Instead, the model aims to provide quantitative foundations on which those economic assessments can be constructed for particular provider settings. (A link to the LIRM is provided in the References section of this document.)

At this time, LRIM addresses only GS1 implications for supply chain operations in commodity medical/surgical products. In the near future the CIHL team plans to enhance LRIM or create sibling versions to address other categories of products including Pharmaceuticals, Implantable Devices, and Surgical Materials.

Hot Spots for ROI

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. 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.

Supply Chain Information Management

Track the number of times the following problems occur before and after GDSN implementation:

- Incomplete vendor and/or product information.
- Nonstandard vendor names.
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- Vendor product numbers with missing information or additional characters.
- Overly abbreviated product descriptions.
- Product descriptions that are not normalized or may have missing attributes.
- Unclassified products.
- Product information is not correct in supply chain support systems.
- Supplier information is not correct in supply chain support systems.
- There is incomplete and/or outdated product information in supply chain support systems.
- There is incomplete and/or outdated supplier information in supply chain support systems.

Labor Management

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

- Hours devoted to maintaining product and supplier information across IT systems.
- Hours devoted to dealing with product and location information problems and errors.

Purchasing & Supply Chain Management

Well-selected metrics provide data that can help drive decisions, identify areas of vulnerability, and determine the overall effectiveness of supply chain operations. A few metrics that may be useful for assessing GDSN ROI are listed below. Providers are encouraged to use whichever metrics best fit your organization and its operations. They should be evaluated before and after GDSN implementation:

- Supply Expense per Adjusted Patient Day (most commonly used indicator for measuring cost)
- Non-contract Spending (measures compliance with purchases through a GPO contract).
- Total Off-Tier Losses (i.e., losses resulting from the failure to achieve tier levels)
- Non-Consolidated Tier Losses (i.e., losses resulting from the failure to achieve tier levels)
- Loss Due to Vendor Selection (i.e., dollars associated with off contract purchases)
- Item Standardization Rebate Loss (i.e., loss resulting from the failure to meet rebate thresholds by product category)
- Vendor Standardization Rebate Loss Dollars (i.e., losses resulting from the failure to meet rebate thresholds at the vendor level)
- On-hand Inventory Value (i.e., how much cash is tied up in inventory and unavailable for other uses)
- Accounts Payable $ on Hold Pending Invoice Discrepancy Resolution (potential for lost revenue increases; time spent on resolving discrepancies results in higher management costs)
- % Purchases Without Invoice Discrepancies (measures the results of invoicing practices)
- Available Rebates Not Collected (measures results of effective rebate management)

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• Number of Vendors Used (measures the results of vendor standardization; i.e., the fewer the vendors, the more likely to take advantage of volume purchases and rebates)

• Rebate Index Indicator (measures the results of contract compliance efforts and tier achievements)

• Requisitions Processed Electronically (tracks the volume of requisitions processed and the effectiveness of e-supply management)

• % Purchase Transactions Via “e-commerce” (tracks the volume of requisitions processed electronically compared to total transactions)

• Non-Contract as % of Total Spending (monitors the rate of purchases that occur from a non-contract vendor; increases in non-contract may indicate new products or rogue buying)

• Non-Compliant Purchases (monitors the dollars associated with non-contract purchases)
Lessons Learned & Best Practices

The following case studies illustrate lessons learned and best practices for GDSN implementation. The documents can be found in the GS1 Healthcare US Online Document Library. (Visit www.gs1us.org/healthcare to download.) In addition, links are provided in the References section of this Tool Kit.

- 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
- GDSN Etoile 2007 Report: Lessons Learned -- GDSN and Interoperability
- HFMA's 2005 Supply Chain Benchmarking Survey: Managing Resources to Achieve Improved Economic Outcomes and High-Quality Care


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 trading partners, 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 vendors’ 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
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**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 [www.gs1.org/gdsn](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 exchange data from trading partners.

Suppliers and 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 [www.gs1.org/gdsn](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 [www.gs1.org/gdsn](http://www.gs1.org/gdsn).

**Why should my organization consider implementing the GDSN?**

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

A 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/registration/consent/default.aspx](https://dmmonline.dscp.dla.mil/registration/consent/default.aspx)

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

**Where can I find additional information regarding GDSN?**

Additional information is available at [www.gs1.org/gdsn](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. 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.6.2) 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 also available here.

How should I implement GDSN in my organization?

This section is based on the assumption that your organization wishes to move to the full implementation vision of the GDSN.

1) Get commitment from Senior Management for your GDSN strategy. Communicate this commitment internally and to your trading partners and get “buy-in” across the organization structure.

2) Build your organization-specific business case on the basis of the rationale and link it to key performance indicators. This can be achieved by assessing your current business processes to define the benefits and your current IT landscape to define the implementation costs. The specified ambition level will allow you to spread the investments over time. Build your roadmap or project plan for the coming years and use the business case to identify the key performance indicators to track the benefits (business and technical) and maintain visibility of the overall progress.

3) Ensure that your organization and your trading partners have adopted the GS1 System GTIN, GLN, Global Data Dictionary (GDD) and Global Product Classification (GPC) code standards. This is indeed a key prerequisite to start the GDSN.

4) Clean up internal data Catalogs and ensure that you are able to send/receive all data attributes (Master Data) to/from your trading partners in a Global Data Dictionary (GDD) compliant structure. This step is critical and should not be underestimated as several studies have shown that this process could take longer than originally assumed or anticipated.

5) Subscribe to a GDSN-certified Data Pool. A list of the currently certified data pools is available on the GDSN website at www.gs1.org/gdsn

6) Subscribe to the GS1 Global Registry through GDSN-certified Data Pool.
7) Start working with a few key items and attributes and with a small, selected number of trading partners that are strategically important and committed to develop the capabilities required to exchange clean and GS1 System standards compliant data.

8) Engage in pilots with these selected partners, monitor results and make necessary workflow, process and technical adjustments before moving to full production.

9) Support the drive towards industry-wide participation by encouraging other trading partners and organizations to join the GDSN by sharing your results and publishing case studies.

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. 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 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 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>
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<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 provider.</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>
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<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>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>Term</td>
<td>Glossary Definition</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</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>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/services/gsmp/kc/gdsn/index.html

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

- 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 Provider 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

• *Levels, Readiness and Impacts Model* (LRIM) (from the Center for Innovation in Healthcare Logistics)
  http://cihl.uark.edu/5174.php

• 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](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>Commpoint Communications International, inc.</td>
<td>CGS datapool services v2.1 release 1.0</td>
<td>Mike Dunbar</td>
<td>5 Scanlon Court Aurora</td>
<td><a href="http://www.commpoint.com">www.commpoint.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Director of Sales 905 727 6782 ext 2208</td>
<td>Ontario, Canada, L4G 7B2</td>
<td><a href="http://www.cgsdatapool.com">www.cgsdatapool.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:MikeD@commpoint.com">MikeD@commpoint.com</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edgenet</td>
<td>Product Registry v2.1</td>
<td>Zac Garrison</td>
<td>N16 W23233 Stone Ridge Dr.</td>
<td><a href="http://www.edgenet.com">www.edgenet.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Manager of Data Acquisition 262.953.8132</td>
<td>Suite 270 Waukesha WI 53188 USA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:zgarrison@bighammer.com">zgarrison@bighammer.com</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSE Inc.</td>
<td>FSEnet+ Data Pool v1.0</td>
<td>Keitt Moore</td>
<td>77 Rumford Ave Suite 3</td>
<td><a href="http://www.fsenet.com">www.fsenet.com</a></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vice President of Bus. Dev. 617.340.3930</td>
<td>Waltham, MA 02453</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td><a href="mailto:keitt@fsenet.com">keitt@fsenet.com</a></td>
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<td></td>
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<tr>
<td></td>
<td></td>
<td>Hugh McBride</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Chief Operating Officer 617.340.2068</td>
<td><a href="mailto:HughMcB@fsenet.com">HughMcB@fsenet.com</a></td>
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<td><a href="mailto:hugh@fsenet.com">hugh@fsenet.com</a></td>
<td></td>
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</tr>
<tr>
<td>iTradeNetwork, Inc.</td>
<td>ITN_GDS (ITN Global Data Services) V1.1</td>
<td>ITN Global Data Services 925.660.1112</td>
<td>5959 W. Las Positas Blvd Peleasant, CA 94588</td>
<td><a href="http://www.itradenetwork.com">www.itradenetwork.com</a></td>
</tr>
<tr>
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<td></td>
<td><a href="mailto:sales@itradenetwork.com">sales@itradenetwork.com</a></td>
<td></td>
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<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>
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<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</td>
<td>N. America &amp; Asia</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>Gina Baker</td>
<td>4601 Presidents Drive</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>703.234.5215</td>
<td>Suite 235, Lanham, MD 20706, USA</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:gbaker@sa2worldsync.com">gbaker@sa2worldsync.com</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Europe</td>
<td>Corporate &amp; European Headquarters</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lorraine Knight</td>
<td>Maarweg 149-161, D 50825 Köln, Deutschland</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>+44 199 383 0366</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><a href="mailto:lnknight@sa2worldsync.com">lnknight@sa2worldsync.com</a></td>
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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>
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<tbody>
<tr>
<td>Functional Name</td>
<td>Value- &quot;Default&quot;</td>
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<td></td>
<td>(Unless actual values are populated)</td>
</tr>
<tr>
<td>Height, Width, Depth</td>
<td>0.001</td>
</tr>
<tr>
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<td>(unless actual value needed)</td>
</tr>
<tr>
<td>Is Trade Item a Consumer Unit?</td>
<td>Value- &quot;FALSE&quot;</td>
</tr>
<tr>
<td>Is Trade Item an Invoice Unit?</td>
<td>(unless actual value needed)</td>
</tr>
<tr>
<td>Is Trade Item a Despatch Unit?</td>
<td></td>
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<tr>
<td>Is Trade Item a Variable Unit?</td>
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</tr>
<tr>
<td>Is Packaging Marked Returnable?</td>
<td></td>
</tr>
<tr>
<td>Product Range</td>
<td>Value- &quot;INDICATORS DEFAULTED&quot;</td>
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<tr>
<td></td>
<td>(Only populated when the Indicators listed here contain default values and NOT actual values)</td>
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</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
15. Start Availability Date Time
16. Effective Date
17. Minimum Trade Item Lifespan from Time of Production
18. Minimum Trade Item Lifespan from Time of Arrival
19. Healthcare Trade Item Reusability Information
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