



Global GDSN Healthcare Implementation Initiative

Phase 2 Report

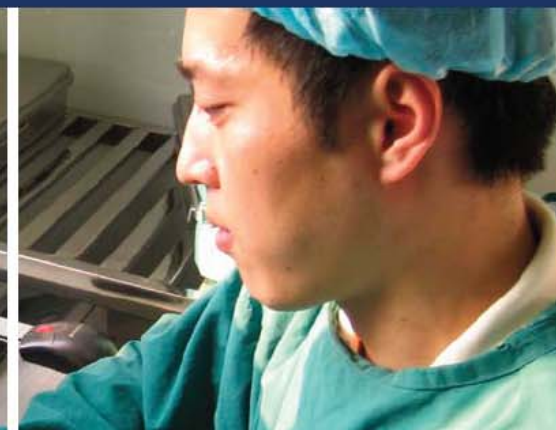
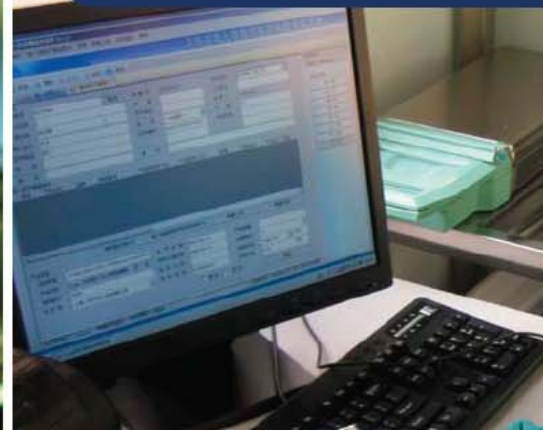


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Purpose of the document

This document is meant to assist participants in all parts of the healthcare supply chain – suppliers, manufacturers, providers, distributors, wholesalers, GPOs and others – to implement the GS1 Global Data Synchronisation Network (GDSN). It outlines the key tasks necessary to ensure that implementation moves forward with little to no disruptions. It shares learnings and explains the processes and best practices established by other companies in their deployment of the GDSN. By following these steps, new users of the GDSN can quickly take advantage of all of its benefits.

This document will be updated periodically as new implementations are made available and additional lessons learnt can be shared.

Introduction

Why synchronise data in the healthcare sector?

There are many systems across healthcare organisations that use and rely on information about products and supply chain partners, including inventory replenishment and distribution systems, billing/accounts payable, Barcode Point of Care (BPOC) systems, prescription drug traceability systems, medical device reporting, etc. The Unique Device Identification (UDI) System will also require data in a common format, and regulatory agencies will build capabilities to pull product data from electronic product catalogues to populate their national drug and device databases.

Unfortunately, in the many systems in existence today, there is generally no central, authoritative database that houses all of that information and ensures that it is accurate and up-to-date. 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.

This sort of unreliable and inefficient data management in the healthcare supply chain results in increased costs for manufacturers, distributors and healthcare providers. Furthermore, data management problems can negatively impact patient safety.

What is the GS1 Global Data Synchronisation Network (GDSN)?

The GS1 Global Data Synchronisation Network (GDSN) provides a powerful environment for secure and continuous synchronisation of data. The GDSN is a network of interoperable GDSN-certified data pools connected by the GS1 Global Registry. These data pools serve as repository where trading partners can obtain, maintain, validate and exchange information on items and parties in a standards-based environment while allowing for a single point of entry via the GDSN.

Many suppliers and their customers around the world – particularly in the Fast Moving Consumer Goods (FMCG) sector – have already discovered how synchronising data using the GDSN can bring both benefits



and opportunities. The GDSN is tested and proven; its infrastructure is in place and it is built on the GS1 System of Standards.

All GDSN Standards are available in the GS1 Knowledge Center: www.gs1.org/gsmc/kc/gdsn

About the Global GDSN Healthcare Implementation Initiative

A growing number of organisations in the healthcare sector have chosen the GS1 GDSN to help them improve collaboration with their supply chain partners. The Global GDSN Healthcare Implementation Initiative is a user-led initiative to take significant steps towards the global use of the GDSN for healthcare products. The initiative aims to demonstrate that the GDSN is uniquely positioned to meet current and emerging requirements for electronic product catalogue data, including pending regulatory and tender requirements, and to facilitate sector-wide implementation by sharing lessons learnt and best practices.

The following healthcare organisations currently participate in the Global GDSN Healthcare Implementation Initiative (dd. 19 February 2010):

- | | | |
|----------------------|--|--|
| - Abbott Nutrition | - Johnson & Johnson | - University Community Hospitals UCH |
| - Alcon Laboratories | - Kimberly Clark | - Tampa University Hospital |
| - Amerinet | - Linde Medical | - Augusta GA |
| - Applied Medical | - Novation | - University of Kentucky |
| - Aurora Health Care | - Ohio State University Medical Center | - University of Mississippi Med Center |
| - Baxter | - Owens & Minor | - Waldo County General Hospital |
| - BD | - Premier Health Partners | - Walgreens |
| - Cardinal Health | - Premier | |
| - Cook Medical | - Sage Products | |
| - CR Bard | - Sisters of Mercy Health System | |
| - DeKroyft Metz | | |
| - Georgia Pacific | | |

About GS1 and GS1 Healthcare

GS1 is a neutral, not-for-profit organisation dedicated to the design and implementation of global standards and solutions to improve the efficiency and visibility in supply chains. GS1 is driven by more than a million companies, who execute more than six billion transactions a day with the GS1 System of Standards. GS1 is truly global, with local Member Organisations in 108 countries, with the Global Office in Brussels, Belgium. Read more about GS1 at www.gs1.org.

GS1 Healthcare is a global, voluntary healthcare user group developing global standards for the healthcare supply chain and advancing global harmonisation. 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. Read more about GS1 Healthcare at www.gs1.org/healthcare.



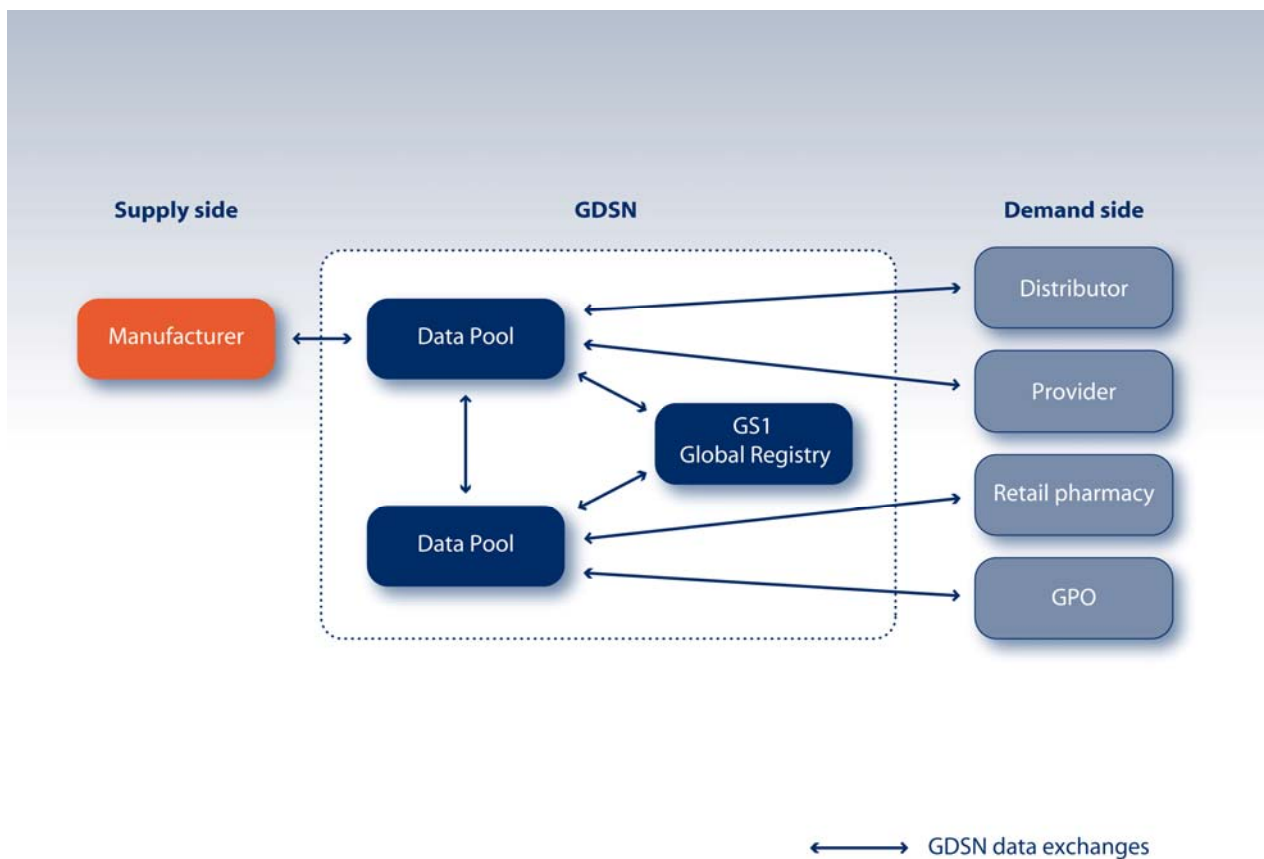
GDSN data flow models

The data flow models in this section are based on the experience of those organisations that participated in phase 2 of the Global GDSN Healthcare Implementation Initiative. The intention is to ensure that the original source of data is the manufacturer, regardless of who the subscriber is. These scenarios ensure a standardised item master across the entire healthcare supply chain. The synchronisation of information assures that both parties have the correct and most current information to be used in transactions, such as purchase orders and invoices. The GDSN is the mechanism which is used to provide the data. The data is then integrated into internal systems; transactions are managed by systems outside of the GDSN (see the transactions communications diagram on page 7).

The use cases will help to understand how data will be used when a manufacturer provides it via the GDSN. Some providers will share how they will incorporate the standards based on incorporating information into the day to day process within the contract to cash cycle.

There may be additional data flow models which emerge as other user communities implement. This document will be updated periodically as other implementations occur and users share their experiences.

Healthcare adoption model



The goals in the first phase of healthcare adoption of GDSN were intentionally developed to keep the barriers to entry low. The “40 Attributes” were selected as a “path of least resistance” after in depth reviews of provider, GPO and distributor requirements for adding new items, existing data management processes at manufacturers and the data entry requirements for the GDSN itself (originally established by retailers).

The recommended adoption model employs a similar technique by answering the question: How should the industry utilise the existing GDSN to allow for the most rapid adoption of a standardised item master by healthcare trading partners?

The model assumes that:

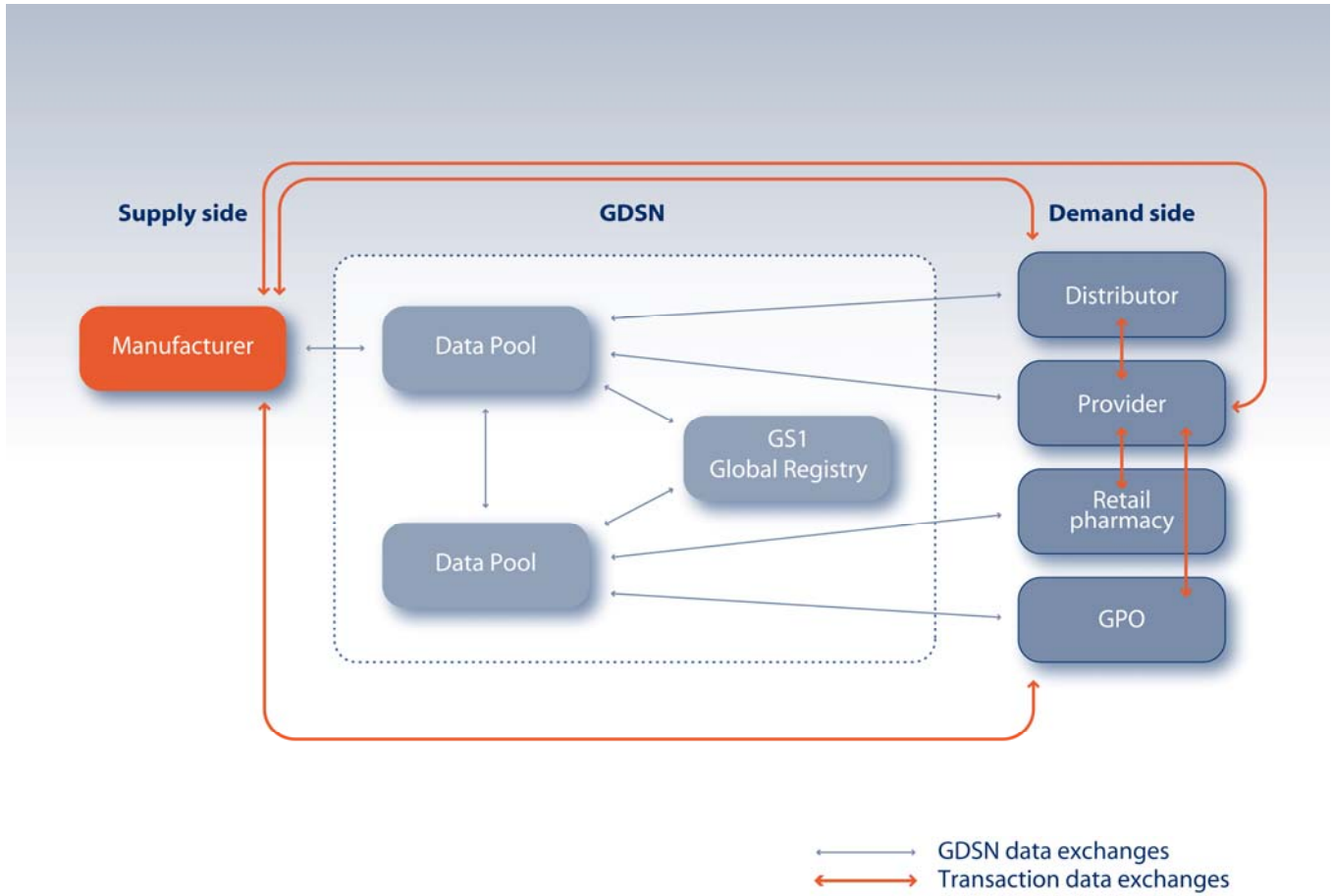
- Manufacturer-provided data will be the foundation of the industry’s standardised item master
- Manufacturers will synchronise directly with distributors and GPOs via GDSN
- GPOs will pass standardised item master data to their members along with contract information and pricing
- Manufacturers may choose to synchronise directly through GDSN with large providers and Integrated Delivery Networks, but that most providers will receive manufacturer product data indirectly
- Trading partners will incorporate standard identifiers for products (GTINS) into their business transactions

GDSN supports the capability for manufacturers to publish attributes at a partner specific level, but to facilitate data entry and reduce complication, the initial adoption model assumes that manufacturers will populate GDSN with trading partner neutral information in the “Boolean” fields (i.e., a field which requires the user to respond with a “true” or “false” to a predetermined statement). Specifically, manufacturers may publish item data answering the Boolean fields assuming that the Case level of the hierarchy is shippable, invoice-able and orderable. Trading partners may elect to utilise the Booleans in a partner specific fashion at their discretion.

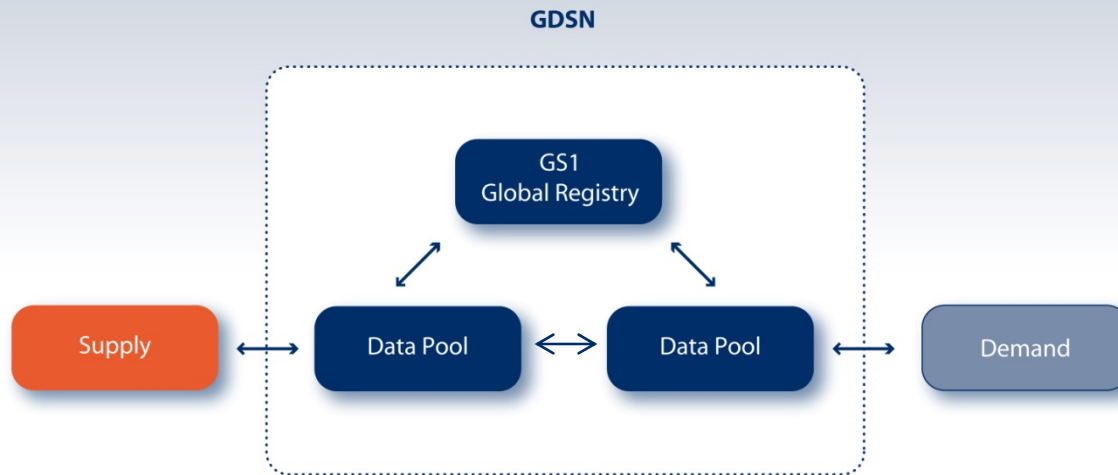
The authors of this report recognise that in certain applications user communities might utilise national product catalogues or data repositories to centralise the distribution of data to healthcare providers. Local repositories are an important part of regional implementation strategies. When these repositories are connected to the GDSN, the principle of a single item model is upheld. These data models will be covered in a future report of the Global GDSN Healthcare Implementation Initiative.



Transaction communications contain standardised data:



Messaging choreography



1. Buyer and supplier agree to synchronise
2. Buyer creates GLN subscription
3. Supplier publishes agreed items
 - a. Only those items that are expected and relevant to the trading relationship
 - b. Booleans answered neutrally (CASE is shippable and invoice-able)
4. Buyer receives data and sends “Response” as confirmation of receipt
5. Buyer sends relevant message
 - a. Review – disagree with data
 - b. Reject – does not need or want the data
 - c. Synchronised – incorporated to buyer ordering system (or GPO catalogue)
6. Supplier sends update message as necessary

Your business model can dictate other rules that may apply.

Please refer to Appendix C for a step by step overview of how to Publish and Subscribe to the GDSN.



Use Case 2: Manufacturer to distributor



There are three scenarios for the data exchange between manufacturer and distributor: Add/new product, update existing product and discontinue a product.

1. Scenario 1: Add/new product

- a. Manufacturer introduces new product
- b. Manufacturer generates a GTIN for product to publish along with all available packaging and attribute information to data pool
- c. Data pool performs validation, registration in the global registry and publication to data recipients
- d. Distributor subscribes to published product and synchronises the data
- e. Distributor uses the synchronised product data to interface items and packaging to their database

2. Scenario 2: Update existing product

- a. Manufacturer has updates/modifications to product attributes
- b. Manufacturer makes updates/modifications to the items that have been published
- c. The updates/modifications will be automatically sent to the data recipient whenever the data recipient's subscription is scheduled to run
- d. Distributor subscribes to updated published product and synchronises the data
- e. Distributor uses the synchronised updated product data to interface items and attribute changes to their database

3. Scenario 3: Discontinue a product

- a. Manufacturer discontinues product
- b. Manufacturer sets a date* to communicate the date on which the trade item is no longer manufactured
- c. Manufacturer generates an extract to publish for all applicable attribute changes
- d. Distributor subscribes to updated published product and synchronises the data
- e. Distributor uses the synchronised updated product data to interface items and attribute changes to their database

Note: If distributor combines and repackages product, (for example: kits) the distributor of the repackaged product would assign the GTIN and related attributes. The distributor then acts as a manufacturer. (See Use Case 1 for more information.)



Use Case 3: Manufacturer to GPO



There are three scenarios for the data exchange between manufacturer and GPO: Add/new product, update existing product and discontinue a product.

1. Scenario1: Add/new product

- a. Manufacturer introduces new product
- b. Manufacturer generates a GTIN for product to publish along with all available packaging and attribute information to data pool
- c. Data pool performs validation, registration in the global registry and publication to data recipients
- d. GPO subscribes to products published and synchronises the data
- e. GPO uses synchronised product data to interface items and packaging to their system

2. Scenario 2: Update existing product

- a. Manufacturer has updates/modifications to product attributes
- b. Manufacturer makes updates/modifications to the items that have been published
- c. The updates/modifications will be sent to the data recipient whenever the data recipient's subscription is scheduled to run.
- d. There is no need for the manufacturer to publish again or for the data recipient to subscribe again.
- e. GPO acknowledges change notification from data source and acknowledges
- f. GPO uses synchronised product data to interface items and attributes changes to their system
- g. GPO uses electronic file transfers and interfaces to update their catalog system

3. Scenario 3 Discontinue a product

- a. Manufacturer discontinues a product
- b. Manufacturer sets discontinue date for when product will no longer be available to order
- c. Manufacturer generates extract to publish and register for all available attribute changes
- d. GPO acknowledges change notification from data source and acknowledges
- e. GPO uses the synchronised updated product data to interface items and attribute changes to their database



Implementing the GDSN in your organisation

How to get started with GDSN in your organisation? This section answers this question based on the experiences of the participating organisations of the Global GDSN Healthcare implementation initiative.

Common rules of engagement

Implementation of GDSN in healthcare can be accelerated if everyone follows common rules of engagement:

1. Agreed upon set of attributes and their use

- a. A common, minimum set of data attributes is crucial to driving adoption. Much of the data that will be required in the future may not be readily available electronically immediately, and it may take time to modify internal systems to process and store this data (and more time to actually collect the data and populate into these modified systems).
- b. Focus first on the key information needed to facilitate e-commerce and patient safety goals, adding more data over time.
- c. It is also imperative that everyone shares the same meaning and usage of the provided data—having any inconsistency or ambiguity about what the data means detracts from the value of that data. Adhering to established data definitions is therefore a pre-requisite to successful adoption.

2. Agreed upon responsibilities

- a. All participants: understand the GDSN data attribute definitions and proper usage, and load data that is consistent with those definitions. (see Appendix A for a list of attributes). All trading partners are identified by a Global Location Number (GLN)
- b. Supply side participants: identify and load all levels of item GTINs and attributes associated with the GTINs, especially that support the need for distributors and providers to load and order items. Adapt internal systems to provide a source for pulling this data to keep the GDSN network refreshed and populated with clean data. Establish procedures and tools to facilitate the loading of new/changed/deleted data.
- c. Demand side participants - Providers: synchronise item data for suppliers they purchase from and load into their Material Management Information Systems (MMIS) system using the Global Trade Item Number (GTIN) and ordering unit of measure, key items for ordering. Adapt internal systems to accept the provided data as-provided. Establish procedures and tools to facilitate the acceptance of new/changed/deleted data.
- d. Demand side participants - Distributors: synchronise item data for suppliers from whom they purchase to sell to providers. Distributor should load into their MMIS system using the GTIN and ordering unit of measure for suppliers and the GTIN selling unit of measure for providers who buy from them. Adapt internal systems to provide a source for pulling this data to keep the GDSN network refreshed and populated with clean data. Establish procedures and tools to facilitate the loading of new/changed/deleted data. Adapt internal



systems to accept the provided data as-provided. Establish procedures and tools to facilitate the acceptance of new/changed/deleted data.

- e. Demand side participants - GPOs should consider using the Global Location Number (GLN) and GTIN to synchronise supply contracts with providers, suppliers and distributors.

Planning before implementation

Some general advice and suggestions to consider as you get started:

- **Build your company-specific business case** on the basis of the rationale and link it to key performance indicators (KPIs). This can be achieved by assessing your current business processes to define the benefits and your current IT landscape to define the implementation costs. This 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 KPIs to track the benefits and maintain visibility of the overall progress.
- **Get commitment from senior management** for your data synchronisation strategy, communicate this commitment internally and to your trading partners, and get “buy-in” across the organisation. .
- **Establish a core business team:** An executive/business sponsor, for commitment and business perspective. Business subject matter experts for business processes and technical resources for day-to-day functionality.
- **Build a cross functional implementation team.** Collect technical documents and implementation information. Identify the internal cross-functional representations. Become involved in the GS1 Healthcare global and/or local user groups. Local Activity: Awareness, education and implementation. Identify the internal cross-functional representation. Global Activity: Get involved in global industry consensus and standards development work
- **Conduct a gap analysis** – see pages 17-19.
- **Select a GDSN-certified data pool.** Evaluate GDSN-certified data pools for the best fit with your organisation’s business objective. Trading partner’s should consider their own internal technical capabilities and services offered by the GDSN data which may complement their own. Criteria to consider:
 - Data record of successful implementation
 - Ability to educate on GS1 standards and industry experience.
 - Ability to provide the necessary data in the format needed
 - Ability to provide data in a timely manner to meet the goals and objectives
 - Connectivity options
 - Customer service, support and service level agreements (SLA)

A list of all GDSN-certified data pools can be found at www.gs1.org/gdsn



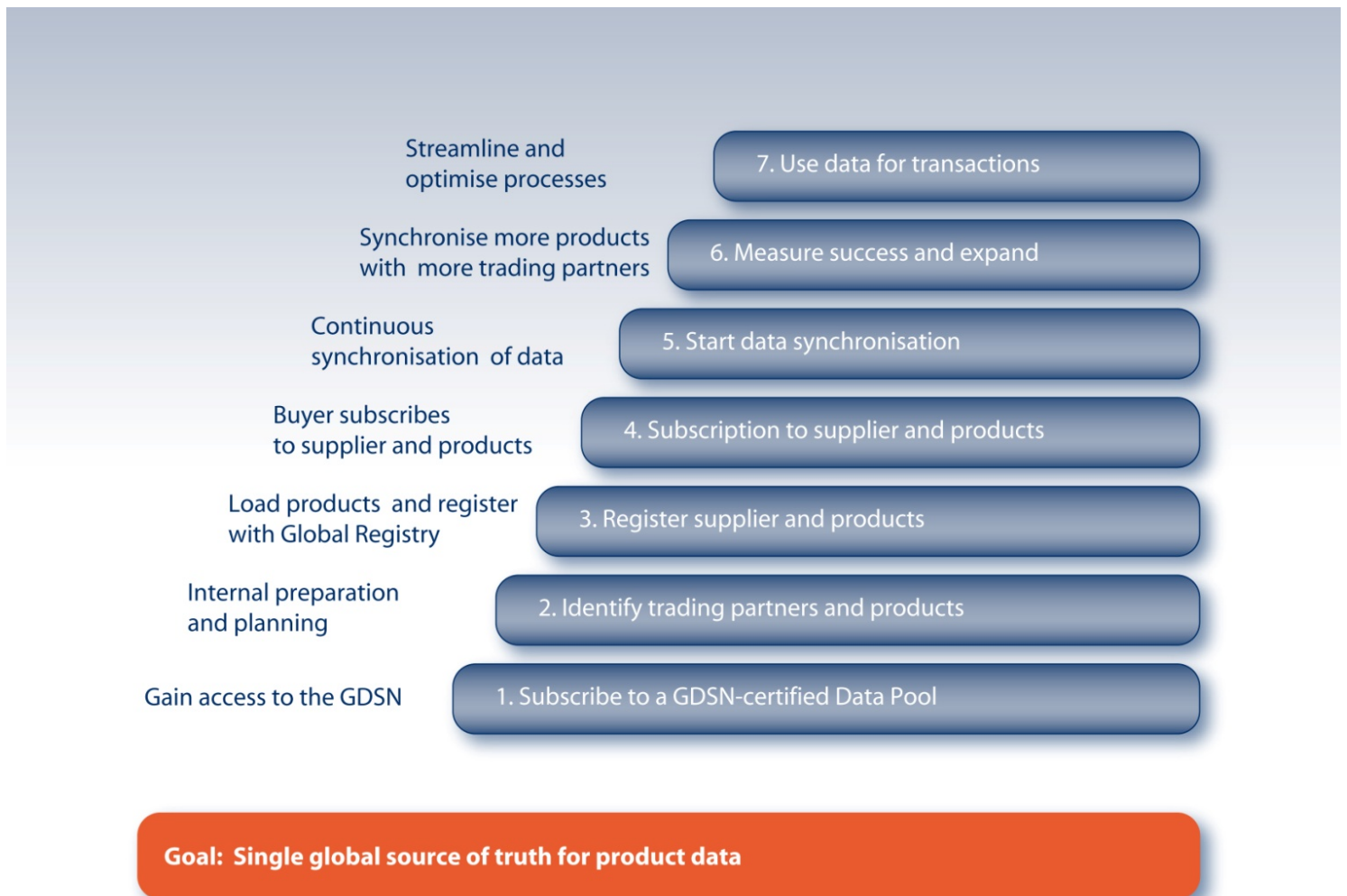
For additional information preparation and planning please consult your local GS1 Member Organisation or GDSN certified data pool.

GS1 Member Organisations: www.gs1.org/contact

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

GDSN Implementation Roadmap

The GDSN Implementation Roadmap provides a general guideline for implementing the GDSN. This includes measuring success against a predetermined goal and planning to integrate the data into systems used to execute transactions between the trading partners. The scope of this initiative is focused on steps 1 through 6. Expansion is meant to include more trading partners and greater item synchronisation.



Each of the above steps should be viewed as individual deliverables and will require internal planning for the supplier and their customer. Each trading partner should carefully assess their internal readiness and develop a plan to achieve each step. Each step is described below

Step 1: Subscribe to a GDSN-certified Data Pool

Supply side – manufacturers: The goal in this step is to load data to a GDSN-certified data pool and work with the data pool to register your GLN and associated GTIN information. As part of this effort, you should request your company's IT staff to evaluate the various technological options.

Suppliers will need to load data into a data pool, and then advise internal and external teams 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. You should also engage the GLN Operational Team and GTIN Operational Team for support and coordination of effort.

Demand side - hospitals, GPOs and distributors: Data recipients will need to ensure their systems are ready to receive and store relevant GDSN data. A list of the GDSN Implementation Attributes is found at the end of this document in appendix A.

In addition, the demand side must identify the tables/databases in the company's IT systems that rely on product and/or party/location information, and therefore must be synchronised using the GDSN. At a minimum, you should consider the tables/databases in the following IT systems: ERP, purchasing, replenishment, contract administration, recall, ebusiness, rebates and charge backs, classification, inventory management, transportation, controlled substances, etc.

Contact your local GS1 Member Organisation for information on assigning GTINs and GLNs.

Step 2: Identify trading partners and products

Supply side – manufacturers: The goal in this step is to identify the customers with whom your company wishes to synchronise data, and with whom among those customers you will test your GDSN implementation. The most important step in this process is: *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.

In addition your data pool and GS1 may be able to help you identify customers who are already synchronising with other suppliers or who are preparing internal systems for implementation. The Global GDSN Implementation Initiative maintains a list of trading partners who are actively implementing the GDSN in healthcare. For more information on the global implementation initiative contact GS1 at healthcare@gs1.org.

Step 3: Register supplier and products

Supply side – manufacturers: Now that you have subscribed to a GDSN-certified data pool, you can start to load your data into the GDSN. The goal in this step is to assemble all of the GLN and GTINs you need



from your organisation and from your supply chain partners. This step requires close coordination with your organisation'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.

The results of your GAP analysis will assist you in working with your internal IT teams to create automatic feeds to your data pool. The creation of the data file is critical based on file names and field names identified by each regional location of your company.

If a global data pool has been selected for you to upload your data to a centralised location, it is very important to understand how your IT department will accomplish this and the unique identifier for each country.

Appendix A contains a list of the 40 Implementation attributes which have been approved by GS1 Healthcare for immediate implementation. For more information on preparing your internal data including data mapping refer to the previous section of this document.

Step 4: Subscription to supplier and products

Demand side - hospitals, GPOs and distributors: The goal in this step is to communicate with your suppliers and identify partner(s) for testing and plans to implement. Collaboration and communication with your supplier community is critical for successful implementation. In this step you will need to ensure your internal systems are ready and able to receive data from your data pool. This includes system capabilities to receive and store the information, via your chosen data pool. You will send a subscription request to the supplier with whom you have chose to synchronise product information.

Step 5: Start data synchronisation

Supply and demand side: Now that you have successfully published your GLN and GTINs in the GS1 Global Registry (Suppliers) and as a customer you have subscribed to the supplier(s) and their GTINs, you can start to synchronise product data. Your data pool will provide full support as you start the process of synchronising data.

Primary step in the supplier registering products in a data pool is managing the publications to providers within the Data Pool. Assign an individual within one of the business groups who will be responsible for auditing the data being published to the data pool as well as the provider requesting to subscribe to the supplier publish data.

Engage in tests with selected trading partners, monitor results and adjust the necessary workflow, process and technical adjustments before moving to full production.

Step 6: Measure success and expand

Supply and demand side: Measuring your success of implementation is very critical to knowing if what you've published is of use to providers, distributors and GPOs synchronising with the supplier data.

How many trading partners are you in production with?

What is the percentage (%) of synchronised sales or purchases?

What is the percentage (%) of synchronised items via the GDSN?



Step 7: Use data for transactions

Supply and demand side: In addition many GS1 Member Organisations and GDSN-certified data pools have developed tools and training to assist their members with the implementation of the GLN, GTIN and GDSN. Most recently GS1 US, with the support of their community, introduced two GDSN tool kits to assist Manufacturers and Providers prepare for implementation. Each tool kit contains specific steps to guide the trading partner through the critical milestones. For complete details refer to the GS1 Healthcare US Tool Kits via the following link <http://www.gs1us.org/Default.aspx?tabid=162>

If your organisation is located outside the US, we recommend that you review the Tool Kits and contact your local GS1 Member Organisation for additional support. View all GS1 Member Organisations: www.gs1.org/contact.

For more information on implementing the GDSN refer to the GDSN Trade Item Implementation Guide found in the GSMP Knowledge Centre via the following link <http://www.gs1.org/gsmc/kc/gdsn>

This document provides detailed implementation guidelines and is updated with every release of the GDSN standard.

Transactions identified for implementation

- Purchase orders
- Purchase order acknowledgements
- Advanced ship notice
- Invoice
- Price sales catalog
- Product transfer, account adjustment
- Price automation (Distributor/Wholesaler)
- Product transfer, resale report

Gap analysis

Suppliers should conduct a gap analysis to ensure their data are factually accurate and properly classified. This is essential: Synchronising incorrect or improperly classified data only creates problems, delays and costs in the supply chain.

Ensure that your company and your trading partners have adopted the GS1 GTIN, GLN, Global Data Synchronisation Network (GDSN) standards. Start working with a few key items that you will target to a small number of trading partners that are strategically important and committed to developing the capabilities required to exchange clean, GS1 System standards-compliant data via the GDSN.



Preparation of gap analysis

How to do a gap analysis of internal data versus global healthcare GDSN attributes

1. Start Gap Analysis process
 - a. Recommend a team approach to completing (or at least reviewing) the mapping.
 - b. Form an internal team consisting of all business groups responsible for product data.
 - c. Obtain the list of “40 Global GDSN Attributes for Healthcare” refer to Appendix A GS1 website link: www.gs1.org/healthcare/library (direct link: http://www.gs1.org/docs/healthcare/GDSN_Healthcare_Implementation_Phase1_with_Common_Definitions_V1.0.xls)
 - d. Create a spreadsheet containing the following: (A template is provided in Appendix D).
 - i. Row 1 across all columns list the names for the 40 GDSN attributes for healthcare (1 per column).
 - ii. Row 2 across all columns list a brief description of each GDSN attribute above.
 - iii. Row 3 across all columns leave as a placeholder for mapping your internal field names to each of the 40 healthcare attributes (to be completed as part of activities below).
 - iv. Rows 4 to end list all products you intend to synchronise via the GDSN, one product per row.
 - e. Review all of the attributes and ensure complete understanding. Not all attributes may apply to all of your products.
 - f. Identify all potentially affected stakeholders (internal and external) that may be using one or more of these fields.
 - g. Either work as a team, or in small groups, to identify the best match between the GDSN-required data and what you have in your internal systems.
 - h. Get approval on the mapping from affected stakeholders.
2. Add item package hierarchy data for each applicable attribute and further analyse (e.g pallet, case, each).
 - a. Once the mapping is completed and agreed, now add-in the actual data values from your internal systems to the spreadsheet.
 - i. By looking at actual production values (versus conceptual)) a more meaningful analysis and discussion can happen.
 - ii. This will help you determine how many data points (number of products x number of attributes) are impacted to help estimate timing and workload.
 - b. Determine if your existing data matches the GDSN required data by evaluating the following:
 - i. Ensure the meaning of your data definition and usage is the same and consistent with the GDSN attribute definition.



- ii. For example: if your definition of Carton is described in your systems using a UOM value of CA, then your usage of CA does not match the usage/definition of CA in GDSN.
- 3. For every attribute that does not exactly match the required GDSN data, you need to determine a strategy and plan to cleanse your production data to match GDSN. This can be approached in one of two general ways:
 - a. Change the existing data to match the GDSN data (best option).
 - i. Risk: may inadvertently impact current production operations.
 - b. Create a new set of fields to carry the new GDSN compliant data.
 - i. Risk: must then keep these new fields in-sync with older fields.
- 4. Define any systems modifications, additional software needed and data cleansing tools or services.
- 5. Define Validation requirements
 - a. Systems and processes
 - b. Data values (Alpha or Alpha-numeric or both)
- 6. Define necessary resources from each stakeholder group
- 7. Summarise the results of the internal gap analysis exercise
 - a. Number of affected products
 - b. Number of affected attributes
 - c. Number of affected data points
 - d. General approach to cleansing the data
 - i. Cleanse existing fields
 - ii. Create new fields
 - e. Important: determine cutover strategy for the new data (all at once, by product, by attribute, how to coordinate consumption of the new data by existing systems)
 - f. Affected stakeholders identified and resource requirements from each group
 - g. Important: check your work with your Data Pool and/or GS1 GDSN
 - h. Approval of the Gap Analysis
- 8. Close the Gap Analysis

How to structure initiatives to align your internal data with the standards.

- 1. After approval of the gap analysis, begin implementation of the gap analysis recommendations.
- 2. The implementation can be phased by product group, by subsets of attributes, or by any other logical segmentation. You do not have to implement in all at once.

Updating internal systems based on the gap analysis

- 1. Select a representative subset of the products and cleanse the data
 - a. Evaluate test data with a trading partner to ensure consistency
- 2. If the subset test results are good, then implement the Gap Analysis recommendations
 - a. Ensure adequate attention is placed on the Cutover activities to avoid disruptions
 - b. Ensure you have a formalized Governance Model to maintain data accuracy.
 - c. Communicate Governance Model to all parties involved



Interaction to GDSN

Supply side interaction to GDSN: Uploads product information to data pool

Product GTINs are assigned at the levels of packaging and labeled by the manufacturer who then loads product with all appropriate attributes to their chosen data pool.

The manufacturer will load products based on the following steps to the GDSN via their data pool. *Manufacturers may interact with data pools in different ways.*

New product, update to existing product (Add, change or discontinued)

- Manufacturer identifies product to load: Products packaged, GTINs assigned and labeled.
- Manufacturer updates attribute information in ERP system.
- Set flag in the ERP system to generate interface file of updates, based on attributes for specific products modified.
- Interface file sends change for discontinued date to update data pool based on any product attribute modified - Data pool is updated with discontinued data.
- Discontinued product stays listed as expired product in the data pool and on the GDSN Global Registry. (i.e.: Chargeback/Rebate (845) or Traced Sale Transaction (867)).

Demand side Interaction to GDSN: Downloads product information from data pool

New product, existing product or obsolete product

- Supplier has a new product introduced and has loaded to GDSN
- Buyer connects to their data pool and requests to synchronise with supplier who has updated the product information by GLN.
- Buyer integrates updated file information for suppliers' data and automatically updates MMIS.
- Buyers will interface to their MMIS systems to update all attributes needed for them to do business with the supplier(s). Consult with MMIS representative to see what changes, if any, there are for loading the GLNs and GTINs in the MMIS system. Consider the use of standardised data in other internal systems.
- Determine the appropriate communication infrastructure and install any necessary hardware/software.
- Determine how the data pool will be synchronising any additions, changes, or deletions of the product into the MMIS.
- Select a data sample size and data set. This data will be used to validate connectivity, transaction communication and MMIS loading.
- Select a small group of manufacturers as your beta test.
- Validate data from the test group by creating test purchase order transactions with beta supplier group (Not applicable to GPOs).
- Notify additional suppliers of your plans to use GLNs, GTINs and the GDSN.
- Begin transacting with suppliers: subscribe and synchronise.

This document will be updated periodically as new implementations are made available and additional lessons learnt can be shared.



Appendix A: GDSN Implementation Attributes for Healthcare

GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
GTIN	The Global Trade Item Number (GTIN) for this item.	EAN.UCC numbering structures will be used for the identification of trade items. All of them will be considered as 14-digit Global Trade Item Number (GTIN). Must be present to enable data to be presented to trade item catalogue. Must be submitted by the owner of the data (who may be the original manufacturer, the importer, the broker or the agent of the original manufacturer). This field is mandatory within the Global Data Synchronisation work process.
Pack Level	The attribute <code>tradeItemUnitDescriptor</code> is used to describe the GTIN hierarchy level. Ex: Does the GTIN refer to an each, pack or a case.? Choose from the code list provided.	Describes the hierarchical level of the trade item.
Manufacturer Part Number	Manufacturer's Part Number. An additional (legacy) method for identifying the item (besides the GTIN) that can be populated. This might be a vendor's item number or manufacturer's catalog number. This number can be any other externally assigned identification number for the item. The <code>AdditionalTradeItemIdentificationValue</code> , would be this actual number associated with the item.	Type of the identification system that is being used as an alternative to the Global Trade Item Number. (Alternative means to the Global Trade Item Number to identify a trade item.)



GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
Hierarchy (Parent GTIN)	<p>This is the GTIN of the trade item for the product packaging level immediately above this item. For example if this item is an each, the pack or case GTIN would be populated here to signify it as the packaging level immediately above. Required for all but the highest packaging level.</p> <p>Conditional with the child GTIN.</p>	<p>A particular Global trade item Number, a numerical value used to uniquely identify a trade item. A trade item is any trade item (trade item or service) upon which there is a need to retrieve pre-defined information and that may be planned, priced, ordered, delivered and or invoiced at any point in any supply chain. In this context, the GTIN for the parent item of the current item.</p>
Hierarchy (Child GTIN)	<p>This is the GTIN of the trade item for the product packaging level immediately below this item. For example if this item is a pack or case, the each GTIN would be populated here to signify it as the packaging level below. Required for all packaging levels other than the lowest or base level.</p> <p>Conditional with the parentGTIN.</p>	<p>A particular Global trade item Number, a numerical value used to uniquely identify a trade item. A trade item is any trade item (trade item or service) upon which there is a need to retrieve pre-defined information and that may be planned, priced, ordered, delivered and or invoiced at any point in any supply chain. In this context, the GTIN for the current item which is a child item of another item.</p>
Hierarchy (Quantity of Children)	<p>This is the actual quantity of the child items contained in this item.</p> <p>Ex: If the GTIN is for a Pack, this field contains the number of eaches in the pack. If the GTIN is for a Case, this field contains the number of Packs in the Case.</p> <p>Conditional with quantity 'QuantityOfNextLowerLevelTradeItemofChildren'.</p>	<p>Value indicates the number of unique next lower level trade items contained in a complex trade item. A complex trade item can contain at least 2 different GTINs.</p> <p>This represents the Total quantity of next lower level trade items that this trade item contains.</p>
Publisher Global Location Number (GLN)	<p>The GLN of the company or entity publishing the product information.</p>	<p>Combination of this field (gln) + gtin + target market uniquely identifies a set of attributes for a trade item. The data owner is not necessarily the source of the data, but has the responsibility to provide and maintain the data in the catalogue. This field is mandatory within the Global Data Synchronisation work process.</p>



GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
Target Market	<p>The country in which the item is intended to be sold. In GDSN, the list of the geographical regions or countries is defined by the ISO-3166-1 code system. The value used is the 3-digit numerical code.</p> <p>Ex: The Target Market country code for the United States is 840 reference in appendix “#”</p>	<p>ISO 3166-1 format 3 digit numerical; following AIDC guidelines. This information drives data synchronisation rules linked to global/local, local status. Combination of this field +GTIN+GLN uniquely identifies a set of attributes or a trade item. This is a repeatable field. This field is mandatory within the Global Data Synchronisation process.</p>
Brand Owner and GLN	<p>The Brand Owner name and GLN of the organisation which has legal ownership of the item.</p>	<p>Name of the party who owns the brand of the trade item. Mandatory when brandOwner Party identification is provided.</p> <p>Unique location number identifying the brand owner. May or may not be the same entity as the information provider, which actually enters and maintains data in data pools.</p>
Manufacturer Name and GLN	<p>The GLN and user assigned name that identifies the manufacturer. The manufacturer is the organisation that has the responsibility for manufacturing the item.</p>	<p>Descriptive name of the manufacturer of the trade item.</p> <p>Unique location number identifying the manufacturer. May or may not be the same entity as the information provider, which actually enters and maintains data in data pools.</p>
Functional Name	<p>This attribute will typically be used to communicate the ‘commodity’ (product family), such as "thoracic drain catheter" or "coronary stent"</p> <p>Answers the question: What does the product do?</p>	<p>Describes use of the product or service by the consumer. Should help clarify the product classification associated with the GTIN. The schema uses common library component as shown in the GDD Max Size field. For the business requirements for item, please use the specific definition of this data type and field, 1-35.</p>
Brand Name	<p>The most recognizable name to the end user as displayed on the product or its packaging.</p> <p>Ex: Band-Aid® Brand Adhesive</p>	<p>The recognisable name used by a brand owner to uniquely identify a line of trade item or services. This is recognizable by the consumer.</p>



GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
Description	The brand owner's description of the product. This information will help further to detail what the item is.	Additional variants necessary to communicate to the industry to help define the product. Multiple variants can be established for each GTIN. This is a repeatable field, e.g. Style, Colour, and Fragrance. The schema uses common library component as shown in the GDD Max Size field. For the business requirements for item, please use the specific definition of this data type and field, 1-350.
Height + Unit of Measure	The measurement of the height of an item as defined in the GS1 Package Measurement Rule. http://www.gs1.org/gsm/kc/gdsn	The measurement of the height of the trade item. The vertical dimension from the lowest extremity to the highest extremity, including packaging. At a pallet level the trade itemHeight will include the height of the pallet itself. Business Rules: Measurements are relative to how the customer normally views the trade item. Needs to be associated with a valid UoM.
Width + Unit of Measure	The measurement of the width of an item as defined in the GS1 Package Measurement Rules. http://www.gs1.org/gsm/kc/gdsn	The measurement from left to right of the trade item. Measurements are relative to how the customer normally views the trade item. Needs to be associated with a valid UoM.
Depth + Unit of Measure	The measurement of the Depth of an item as defined in the GS1 Package Measurement Rules. http://www.gs1.org/gsm/kc/gdsn	The measurement from front to back of the trade item. Measurements are relative to how the customer normally views the trade item. Needs to be associated with a valid UoM.
Gross Weight + Unit of Measure	The measurement of the gross weight of an item, includes all packaging, as defined in the GS1 Package Measurement . http://www.gs1.org/gsm/kc/gdsn	Used to identify the gross weight of the trade item. The gross weight includes all packaging materials of the trade item. At pallet level the trade itemGrossWeight includes the weight of the pallet itself. For example, "200 grm", value - total pounds, total grams, etc. Has to be associated with a valid UoM.



GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
Net Content + Unit of Measure	<p>The total amount of the trade item contained by a package, usually as claimed on the label.</p> <p>For example if a trade item is a bottle of 500 tablets the net content of this trade item is 500 pieces. For example if a trade item is a bottle of 500ml of saline the net content of this trade item is 500 ml.</p>	<p>The amount of the trade item contained by a package, usually as claimed on the label. For example, Water 750ml - net content = "750 MLT" ; 20 count pack of diapers, net content = "20 ea.". In case of multi-pack, indicates the net content of the total trade item. For fixed value trade items use the value claimed on the package, to avoid variable fill rate issue that arises with some trade item which are sold by volume or weight, and whose actual content may vary slightly from batch to batch. In case of variable quantity trade items, indicates the average quantity.</p>
Consumer Unit Y/N	<p>An indicator identifying if the item is marked (Bar Coded) and packaged as a consumer unit so as to have the ability to be sold in a retail outlet. The answer for consumer unit is YES.</p> <p>If the item is a non-consumer package, the answer here is NO.</p>	<p>Identifies whether the current hierarchy level of a trade item is intended for a ultimate consumption. For retail, this trade item will be scanned at point of sale. At retail, this data is commonly used to select which GTINs should be used for shelf planning and for front end POS databases. This value reflects the intention of the Information Provider which may not necessarily be reflected by the retailer.</p>
Orderable Unit Y/N	<p>An indicator identifying if the GTIN can be ordered from the Information Provider. The Information Provider should expect to receive orders from the recipient using this GTIN.</p>	<p>An indicator identifying that the information provider considers this trade item to be at a hierarchy level where they will accept orders from customers. This may be different from what the information provider identifies as a despatch unit. This may be a relationship dependent based on channel of trade or other point to point agreement. This is y/n (Boolean) where y indicates the trade item is an ordering unit.</p>



GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
Invoice Unit Y/N	An indicator identifying if the GTIN can be invoiced from the Information Provider. Recipients should expect GTINs flagged as invoice units to be those that will appear on invoices and other financial documents. Ex: Invoicing at the "each" versus at the "case" level.	An indicator identifying that the information provider will include this trade item on their billing or invoice. This may be relationship dependent based on channel of trade or other point to point agreement. This is y/n (Boolean) where y indicates the trade item is an invoicing unit.
Shipping Unit Y/N	An indicator identifying if the trade item is a "ship-able" GTIN from the Information Provider. For example if a packaging hierarchy has an each and a case with the case being marked as the only shipping unit, the recipient should expect all shipments to be made in cases.	An indicator identifying that the information provider considers the trade item as a dispatch (shipping) unit. This may be relationship dependent based on channel of trade or other point to point agreement. This is y/n (Boolean) where y indicates the trade item is a dispatch unit.
Base Unit Y/N	An indicator identifying if the GTIN is the lowest level of an item's hierarchy. This GTIN can not have any children.	An indicator identifying the trade item as the base unit level of the trade item hierarchy. This is y/n (Boolean) where y indicates the trade item is a base unit.
Variable Unit Y/N	An indicator identifying if the GTIN is not a fixed quantity item. The item can vary by any dimension and is not traded in discrete quantities.	Indicates that an article is not a fixed quantity, but that the quantity is variable. Can be weight, length, volume. trade item is used or traded in continuous rather than discrete quantities.
Returnable Package Y/N	Identifies if the GTIN's packaging is marked that it can be returned to the source. Such packaging would then be reused or recycled for reuse in packaging other items.	Trade item has returnable packaging. This is a yes/no (Boolean) where yes equals package can be returned. Attribute applies to returnable packaging with or without deposit.
Markings: Marked with Lot Number Y/N Batch-Number Non-SoldTradeItemReturnable TradeItemMarkedasRecycleable	Identifies if a GTIN is marked with a batch or lot number. Note: Of the three attributes it is believed this is the one which is the most applicable to healthcare.	Indication whether the base trade item is batch or lot number requested by law, not batch or lot number requested by law but batch or lot number allocated, or not batch or lot number allocated. A batch or lot number is a manufacturer assigned code used to identify a trade item's trade item on batch or lot. Differs from Serial Number which is a manufacturer assigned code during the trade item on cycle to identify a unique trade item.



GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
Bar code Type	Indicates whether the trade item is physically bar-coded and if so in which format.	Indication if the trade item is physically bar-coded with the primary trade item identification number.
GPC code	GPC Code required for the Global Registry. Ex: 10000447 is the GPC code for paper towels	Global EAN.UCC classification category code. Unique, permanent 10-digit key.
Optional Classification Agency	Category Code value. Ex: UNSPSC, ATC, etc	The name of the agency that maintains the additional classification schema.
Optional Classification Agency Value	Ex: 100785 is the UNSPSC code for paper towels	In the additional classification system, the code that identifies the category.
Start Date	Indicates when the product is available for sale from the supplier.	The date (CCYY-MM-DDTHH:MM:SS) from which the trade item becomes available from the supplier, including seasonal or temporary trade item and services.
Effective Date	Date on which the master data becomes valid.	The date on which the information contents of the master data version are valid. Valid = correct or true. This effective date can be used for initial trade item offering, or to mark a change in the information related to an existing trade item. This date would mark when these changes take effect.
Shelf Life From Production	Indicates the shelf life of the product from the time of production.	The period of day, guaranteed by the manufacturer, before the expiration date of the product, based on the production.
Shelf Life From Delivery	Indicates the shelf life of the product from the time of arrival at the recipient location.	The period of days, guaranteed by the manufacturer, before the expiration date of the trade item, based on arrival to a mutually agreed to point in the buyers distribution system. Can be repeatable upon use of GLN.



GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
Contains Blood	Indicates if an item contains a blood product as an ingredient or component.	<p>The use of this attribute indicates that the trade item is a product that contains blood, blood components or blood products used in the manufacturing.</p> <p>Relates to both drugs and medical devices.</p>
Implantable	Indicates if an item can be partly or totally inserted into the body.	<p>Optionally need the ability to indicate if trade item is Implantable.</p> <p>Definition: Implantable devices are defined as devices that are partly or totally inserted into the human body.</p> <p>Examples of implantable trade items: heart valves, artificial hip joint, stents.</p> <p>Relates to both drugs and medical devices.</p>
Contents of Concern	Indicates if an item's contents have specific health concerns that should be taken into account when handling, storing, or using the item.	<p>Ability to identify specific contents. These are contents that healthcare providers often need to identify and communicate between trading partners. Some patients may require special considerations if a trade item contains an item of concern.</p> <p>Example Diethylhexyl phthalate (DEHP) is widely used as a plasticizer in manufacturing of articles made of Poly Vinyl Chloride (PVC). Plastics may contain 1% to 40% of DEHP.</p>



GS1 Global Common Name	Healthcare Common Definition	GS1 Global Data Dictionary Definition
Reusability Types	Indicates if an item can be used multiple times or if it is a single use.	<p>Determines if the product is intended for single or multiple uses, including the number of validated cycles and the number of times a product can be used according to the manufacturer specifications.</p> <p>It is suggested that medical providers consult the device manufacturer's Instruction For Use (IFU) for full reusability instructions.</p>
Brand or Generic Flag	Indicates if an item is a brand name or generic.	If a value of Yes is provided, it means that the trade item was created by the Brand Innovator of the product; a value of no indicates that it is a generic alternative of the product.
Does Product Contain Latex	Indicates if the item is made from or contains latex.	An indication that a trade item is made from or contains latex which refers generically to a stable dispersion (emulsion) of polymer micro particles in an aqueous medium.



Data types used in the dictionary are as follows:

Data type	Definition
Amount = N (n)	N = total digits, (n) = max decimal positions, do not count decimal. The attribute is associated with a currency code. If the decimal restriction is not indicated, the decimal positions can range from 0 to N
Boolean	"true" or "false"
Date	CCYY-MM-DD + or - hh:mm
Date:Time	CCYY-MM-DDThh:mm:ss.sss + or - hh:mm (full expression) CCYY-MM-DDThh:mm:ss (minimum expression)
Time	hh:mm:ss.sss + or - hh:mm
Enumerated List	Indicates an enumerated list of values (provided in the code list spreadsheet) and some of which are embedded in the XML XSDs
Non-Binary Logic Code List	Code list that allows for the expression of more than binary values (True, False) in the answer to a question
Decimal = N (n)	N = total digits, (n) = max decimal positions, do not count decimal. The attribute is associated with a unit of measure qualifier If the decimal restriction is not indicated, the decimal positions can range from 0 to N
Measurement	A decimal number that is associated with a unit of measurement qualifier. This data type can be repeated for multiple iterations of the same value expressed in different units of measure (e.g. Imperial and Metric)
Description Short	Text descriptions of alpha/numeric characters. This data type is paired with a language qualifier and can be repeated to express the text in as many languages as needed. Typically 70 Characters in length
Description Long	Text descriptions of alpha/numeric characters. This data type is paired with a language qualifier and can be repeated to express the text in as many languages as needed. Can be up to 1,000 Characters in length
String	Text descriptions of alpha/numeric characters. This data type is not paired with a language qualifier
	<p>The use of "Multi" in conjunction with measurement and description attributes provides the ability to convey the same content in multiple ways. For instance:</p> <ul style="list-style-type: none"> * Multi Description allows the data source to send the same textual content in multiple languages, repeating the content and the qualifier as needed * Multi Measurement allows the data source to send the same numerical value in multiple measurement systems (e.g. Imperial and Metric) repeating the content and the qualifier as needed <p>Example syntax for populating a country variation of a Language Code attribute: aa or optionally aa-BB</p>



	<p>where aa = ISO 639 code list, must be lower case</p> <p>where BB =ISO 3166-1 Country Code, 2 Alpha character representation, must be upper case</p> <p>Example syntax for populating Target Market Country Code and Target Market Subdivision codes</p>
Target Market	the 3-digit representation contained in the ISO 3166-1 country code list (NNN)
Target Market Subdivision	the 2-digit representation contained in the ISO 3166-1 country code list followed by a "-" character + the 1 to 3 alpha subdivision code contained in the ISO 3166-2 subdivision code list (AA-aaa)
Total Quantity	a measurement value that does not require a unit of measure



Appendix B: Product classification in GDSN

To register Healthcare items in the GDSN, GS1 Standards have to be used to identify and classify the item:

GLN – Global Location Number

GTIN – Global Trade Item Number

GPC – Global Product Classification

To support the immediate implementation of the Global Data Synchronisation Network (GDSN) in healthcare and allow the proper registration of any healthcare product in GDSN, GS1 has released two GPC codes, one for drugs and another one for medical devices.

GPC Code for Drugs: 10005845

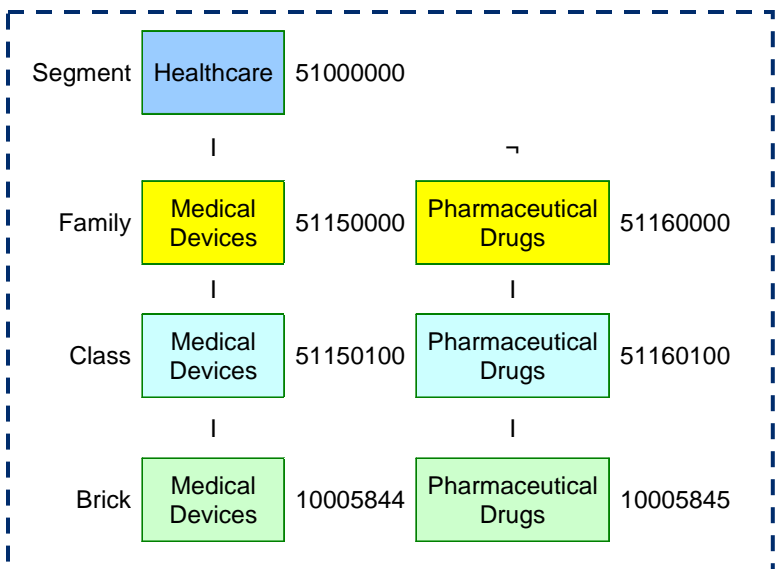
Definition: Any chemical compound used in the diagnosis, treatment, or prevention of disease, and that achieves its primary intended purposes through chemical action within or on the body.

Examples: Includes all drugs and biologicals and therapeutic nutritionals, both human and veterinary applications.

GPC Code for Medical Devices: 10005844

Definition: Products, other than drugs, predominately designed and marketed for use in the diagnosis, treatment, or prevention of disease.

Examples: All medical equipment, devices and supplies, from cotton balls to MRI machines, e.g. IVDs, implants, surgical instruments, examination gloves, gauze pads, sutures, syringes, needles...for both human and veterinary applications.



Other classification systems are also supported in GDSN. More than 20 classification systems exist worldwide, including UNSPSC (United Nations), CLADIMED (France), eClass (Germany), and NHS e-class (UK). The GDSN supports these classification systems by using the “Additional Classification Agency” attribute:

additionalClassification

additionalClassificationAgencyName

additionalClassificationCategoryCode

additionalClassificationCategoryDescription

For more information about GPC, please refer to www.gs1.org/gdsn/gpc;



Appendix C: GDSN message choreography

1. Load Data

The seller registers product and company information in its data pool

2. Register Data

A small subset of this data is sent to the GS1 Global Registry

3. Request Subscription

The buyer, through its own data pool, subscribes to receive a seller's information

4. Publish Data

The seller's data pool publishes the requested information to the buyer's data pool

5. Confirm & Inform

The buyer sends a confirmation to the seller via each company's data pool, which informs the supplier of the action taken by the buyer using the information

Appendix D: Template used for supplier gap analysis

A tool has been developed to assist suppliers performing a gap analysis. The tool is available in the resource library at www.gs1.org/healthcare/library.

This document should be used as a template to assist business people with the mapping of their internal data to the GDSN. For technical development please refer to the GS1 Standards Knowledge Centre. <http://www.gs1.org/gsmc/kc/gdsn>



Glossary

Acronym	Definition
GPO	Group Purchasing Organisation
MO	GS1 Member Organisation
NPC	National Product Catalog (product registry)
GLN	Global Location Number
GTIN	Global Trade Item Number
GDSN	Global Data Synchronisation Network
MMIS	Material Management Information System
ERP	Enterprise Resource Planning
GDD	Global Data Dictionary
GPC	Global Product Classification
SLA	Service Level Agreement



GS1 - The global language of business



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