

Real Answers— The Global Data Synchronization Challenge for Small Businesses



Table of Contents

- Step 1—Understand the Vocabulary3
- Step 2—Understand Your Customer’s Mandates5
- Step 3—Join the GDSN5
- Step 4—Choose a Solution.....6
- Step 5—Upload and Register Your Items8
- Step 6—Synchronize Your Data11
- Step 7—Send Additional Data Through a Portal or Email.....12
- Summary12
- References.....13

If you sell to retailers such as Wal-Mart, you have probably heard the term “Global Data Synchronization.” It is likely that one or more of your retail customers have contacted you to discuss exchanging product information with them via the Global Data Synchronization Network (GDSN) and the GS1 Global Registry™. In addition, you may have received emails or letters from IT service providers contacting you on behalf of retail customers about data synchronization.

Here is the bottom line: global data synchronization can be confusing for small businesses that need the most efficient, least expensive way to address retailer mandates. The purpose of this education brief is to help small businesses address the challenge of data synchronization in seven simple steps.

Does this information apply to me?

The global data synchronization challenge is unique for small businesses. If the questions below apply to your company, this education brief is useful for you.

- Do you have one or two large retail customers mandating data synchronization that comprise up to 50 percent of your annual revenue?
- Do you have just a few employees managing item information?
- Do you have a few hundred (or less) UPCs or items sold?
- Do you do business in one or two countries?

If you find that your business is characterized more by dozens of retail customers, thousands of UPCs, and a complex set of enterprise systems, we recommend that you consult our white paper entitled, “Supplier’s Guide to Defining a Data Synchronization Strategy.” The white paper outlines the key considerations that would be appropriate for larger companies facing a more complex global data synchronization challenge.

Step 1 Understand the Vocabulary

This brief will provide you with a fundamental understanding of what is needed to comply with a data synchronization mandate. Before discussing how to comply, it is important to understand the basic terminology.

Global Data Synchronization (GDS)—GDS is an industry initiative based on GS1 standards-driven processes for the continuous and automated exchange of product information between trading partners.

GS1 System—The GS1 System is a set of standards developed by the Global Standards Management Process (GSMP) that defines the means by which product information will be organized and transmitted. These standards are developed around bar codes, EDI transaction sets, XML schemas, and other supply chain solutions.

Global Standards Management Process—Created by GS1 (formerly EAN International and Uniform Code Council), the GSMP is a global, cross-industry forum comprised of users and technology providers that builds and maintains the GS1 system standards.

GS1 [formerly EAN International and Uniform Code Council (UCC)]—GS1, based in Belgium, is a global, not-for-profit organization that develops global standards and new technologies for supply chain processes. Various regional and country-level subsidiaries are referred to as Member Organizations (MOs), and include GS1 US, GS1 UK and GS1 HK. MOs govern standards-setting activities within their respective geographies.

1SYNC™ (Formerly UCCnet)—A subsidiary of GS1 US, 1SYNC was created to drive the adoption of standards-driven data synchronization in North America. 1SYNC is the result of a merger between UCCnet and Transora.

GS1 Global Registry—The GS1 Global Registry serves as an electronic “phone book” by providing unique identifiers for all product information exchanged through the GDSN. Companies that wish to exchange product information using global data synchronization are required to first register product and company related information with the Global Registry. To register with GS1 Global Registry in the US, visit <http://www.gs1.org/productssolutions/gdsn/subscribe/index.html>.

Certified Data Pool—Certified data pools are repositories of product information that leverage GS1 system standards for item identification, attributes and message formats to exchange information among trading partners and the GS1 Global Registry. There are actually two data pool concepts:

- The ‘Source’ data pool is used by retail suppliers to send item information to the GS1 Global Registry and other data pools in the Global Data Synchronization Network (GDSN).

- The ‘Recipient’ data pool is used by retailers to send subscriptions to the GS1 Global Registry and receive incoming information from source data pools in the GDSN.

While it is technically possible to host and manage your own data pool, most companies choose third-party data pool services to manage this persistent connection to the GDSN. Data pools seeking to become “GDS compliant” must prove standards compliance and obtain certification from GDSN, Inc.

Global Data Synchronization Network (GDSN)—GDSN refers to a global network consisting of certified data pools, the GS1 Global Registry, the retailers and suppliers who share product information via the GDS process, and their interaction with each other.

GDSN, Inc.—GDSN, Inc. is a subsidiary of GS1. It runs the GS1 Global Registry and manages the rules and processes of the GDSN as a whole.

Global Location Number (GLN)—GLN is the identification number assigned to each entity in the GS1 system. Often compared to the DUNS+4 numbers, the GLN is assigned for each sub-entity relevant to the Global Data Synchronization process. These sub-entities can be defined by physical locations, functional entities or legal entities. For example, if you are a paper manufacturer utilizing 15 distribution centers, you may have up to 15 GLNs to reflect the different physical locations or functions of each distribution center. However, if those 15 distribution centers were part of a subsidiary owned by your company, you might have just one GLN to reflect a unique separate legal entity. Devising your company’s GLN strategy requires specific knowledge of how your company needs to be identified in the business transactions supported by Global Data Synchronization.

Global Trade Item Number (GTIN)—GTIN is the identification number assigned to each item in the GS1 system. While often compared to a UPC code, GTIN is an umbrella term for the family of four different numbering structures, including the GTIN-8 (formerly the EAN/UCC-8, the GTIN-12 (formerly the UCC-12 or UPC), the EAN-13 (formerly the EAN/UCC-13), and the GTIN-14. A GTIN uniquely identifies a trade item at every level of the relevant packaging hierarchy. For example, if you sold beverages, you would have separate GTINs for the consumer unit, the six-pack, the case, the pallet, etc.

Global Data Dictionary (GDD)—The GDD is the repository for data related to the precise core component and business definitions of the GS1 system and their equivalent representations in targeted standards such as EDI, XML and AIDC. The GDD was developed to fully support the GS1 Business Message Standards and GS1 XML Standard Schemas.

If you want to learn more about global data synchronization and the benefits expected by the retail industry, please see the References section of this document for additional resources.

Step 2 Understand Your Customer's Mandates

Now that you have an overview of data synchronization terminology, the next step is to understand what it is your retailer requirement means to you. Below are some key actions often found in retailer letters:

- Choose a solution and solution provider
- Join the GS1 Global Registry
- Upload your items to the GS1 Global Registry via a certified data pool
- Synchronize your data
- Send additional data through a portal or email

In addition to these requests, there is often a timeline for participation. Read the timeline information carefully to ensure that you understand exactly what needs to be done by each date. For example, some retailers currently have deadlines for subscribing to a certified data pool, while others have deadlines for full item synchronization.

Finally, you will see that some retailers 'endorse' solution partners for their suppliers. Companies may select any certified data pool or solution provider associated with a certified data pool. Not all solution partners are able to provide the best solutions for small business needs.

Step 3 Join the Global Data Synchronization Network

If your retail customers use the GDSN for data synchronization, you will need to follow suit. Today, many US-based retailers leverage GS1 system standards and the GS1 Global Registry for data synchronization. As a result, a subscription to the GDSN is a requirement for data synchronization with them. While you must sign a Terms of Participation Agreement directly with GDSN, subscription fees are managed and billed by your certified data pool or solution provider.

In addition to joining the GDSN, you will need to register for a GS1 company prefix from GS1 US. To obtain a company prefix, membership in GS1 US is required. This involves a fee. The company prefix is a unique identifier that will become the root of your Global Location Number (GLN). See Figure One below for an example of how this works:

Figure One-Explanation of the GLN

GS1 Company Prefix	0123456
If you have a GS1 US company prefix, you simply add a leading zero to make it a GS1 company prefix. The company prefix may be longer than the 7-digit prefix shown in the sample above.	
GLN Location Reference	12345
The location reference is assigned by you and indicates the unique location, legal or functional entity being identified. The location reference varies in length as a function of the GS1 company prefix. The combined length of the GS1 company prefix and the GLN location reference should be 12 digits. In this example, the GLN location reference is five digits assuming the GS1 Company Prefix is seven.	
Check Digit	3
The Check Digit is a calculated field that ensures data integrity when reading your Global Location Number. You can have the check digit calculated for you at no cost at http://www.uc-council.org/checkdig.htm	
Consolidated GLN	0123456 12345 3
Additional GLNs would be created by changing the GLN location reference to identify additional locations or entities that your company would want to represent to the GS1 Global Registry and your trading partners.	
<i>Source: GLN Implementation Guide, Uniform Code Council, May 2002</i>	

Step 4 Choose a Solution

The next step is to choose a solution provider. Your provider should help you understand the specific requirements for global data synchronization for each retailer. There are several vendors certified by GDSN, Inc. as certified data pools for data synchronization utilizing the GS1 Global Registry. These vendors offer a variety of products and services, ranging from consulting and spreadsheet applications to million-dollar enterprise systems. There are also vendors that serve as certified solution partners working in conjunction with data pools to help enable retail suppliers to implement data synchronization with their chosen data pool.

The following considerations should be critical for all businesses evaluating data synchronization solutions:

- Is the vendor certified with GS1? Only certified data pools are able to implement a solution that works with the GS1 Global Registry and can get information to your retailers using the GDSN. Becoming a certified data pool indicates a vendor's commitment to working with GS1. You can find the list of certified solution partners at http://www.gs1.org/docs/gdsn/gdsn_certified_data_pools.pdf
- Is the vendor committed to the evolving global data synchronization standards? Developing GS1 standards for data synchronization is an ongoing process managed through the Global Standards Management Process, or GSMP. Standards are changing rapidly, and new standards are emerging for the GDSN on a regular basis. As a result, you want to make sure that your solution provider has the resources and intention of keeping up with the latest standards.

- Does the vendor offer a data pool service? The GDSN vision requires that each trading partner belong to either a source or recipient data pool; that data pool will be the vehicle to send or receive product attributes beyond the GS1 Global Registry. Before selecting a solution partner, make sure that the vendor offers a data pool service and the cost of that service.
- Does the vendor offer a complete data synchronization solution? The success of a data synchronization initiative typically hinges on two factors:

Internal Data Accuracy: The data synchronization process begins within your company. Without first ensuring internal data accuracy, external synchronization initiatives with trading partners are bound to fail. Internal data accuracy can be best achieved with a Product Information Management (PIM) solution that can aggregate and cleanse product information within your company and offer a system of sharing the information with external parties via data pools. If you are concerned about internal data accuracy, consider a vendor that offers a PIM solution.

Implementation Methodology: With different internal systems and processes, the data synchronization challenge is unique to each company. A vendor that can offer the necessary experience implementing small companies across industry verticals, along with a proven implementation methodology that offers basic GDSN education workshops, needs assessment and implementation roadmap development will serve you best.

In addition to these key criteria, small businesses should consider the following to ensure selection of a ‘small business friendly’ solution provider:

- **A hosted service**—There are several reasons why a hosted offering is preferable to a software installation for small businesses. First, the hosted option requires no additional expense in hardware, infrastructure or labor to install and configure. Because of this, you can usually become implemented more rapidly on a hosted solution; this may also be important if you have a deadline. Finally, managing and implementing new standards will be accommodated through the hosted system without your intervention.
- **Up-front telephone consultation and implementation help**—Small businesses greatly benefit from remotely delivered consultation and implementation for two reasons. The first reason is cost. Attending training or hosting someone on-site requires outlays for transportation, lodging, etc. The second reason is that all businesses need to digest new information over a few days or weeks; if you have an on-site consultant or are attending a training class, you are not given the time and opportunity to digest information and ask questions.

- **Convenient data input formats**—Human resources are critical to all businesses, but particularly critical to small businesses. For this reason, it is ideal for your data synchronization solution to minimally impact your current business processes. For example, if you are currently sending item data to your customers via EDI, you may not want to make the investment to change to XML. Or, if your sales people manage item information on a spreadsheet and that's working fine for them, why change? Finding a solution provider that offers input formats that work with your existing processes and infrastructure will save you applied time up-front and in the long run.
- **Low start-up costs and monthly billing**—When considering the total cost of ownership (TCO) of your solution, be sure to include both start-up and ongoing costs. For example, if the solution costs \$250 per year but the start-up fees are \$3,000 and require you to send two people to another state for three days of training, the actual TCO in year one might be over \$10,000.
- **Scalable offerings that grow with your business**—Most small businesses are on a trajectory for growth, so solutions that grow with your business are essential. To leverage your existing investment and add new functionality, your solution partner should offer you additional capabilities such as back-office system integration, automated data transformation, workflow and customer subscription management.

Choosing the right solution partner is a crucial step in your overall data synchronization project: if you select the right one, you'll be well on your way to a successful implementation.

Step 5 Upload Your Items to Your Data Pool and Register Them with the GS1 Global Registry

Once you have subscribed to the GDSN and have chosen a solution partner, you will need to prepare your items for upload to the data pool and registration with the GS1 Global Registry. As there are a number of data-intensive activities, this step is often the most time-consuming part of the process. To upload your items, you will need to:

1. **Identify items to be loaded for your retailer.** If you are initially sharing item information with just one retailer, this should be a fairly straightforward process. In general, you pull the current item information from the EDI document, spreadsheet or other internal source. You may want to check to see if your retailer has an item review process prior to uploading your items for the first time. Another consideration is that some retailers simply want your initial upload to be a 'proof of concept;' in that case you need to identify only a manageable subset of your total items.
2. **Prepare the items to include all attributes required by the Global Registry and your customer.** There are many components of this process that will require you to complete the following activities:

- **Familiarize yourself with the required attributes (defined below)**— You should understand what attributes to transmit to satisfy both the GDSN and your retailer’s requirements. In global data synchronization, there are several types of attributes:
 - a. **GS1 Global Registry attributes**—This is the minimal set of attributes required to register a GTIN with the Global Registry. The set includes the GTIN, GLN, Target Market, and Global Product Classification (GPC) code. Your solution partner will be able to provide more detail on the definitions and validation rules for these attributes.
 - b. **Global Data Dictionary (GDD) attributes**—This extensive set of attributes includes all standard mandatory and optional attributes approved for use within the GDSN for populating the messages used to notify retailers of new and changed trade items.
 - c. **Extended attributes**—There are also groups of extended, industry-specific, and retailer-specific attributes that may be optional or required. These attributes are attached to your items by your solution partner and passed to retailers with all basic item information.
- **Assign a GTIN to each level of your packaging hierarchy**— If you currently store information on just one UPC that represents all packaging levels, you will need to expand this to comply with the standards for global data synchronization.

There are four possible structures for the GTIN, depending on whether the base item identifier is a GTIN-8, GTIN-12, GTIN-13, or GTIN-14. In Figure Two, we illustrate the structure using the GTIN-12 (formerly the UCC-12 or UPC).

Figure Two-Explanation of the GTIN

GS1 US Company Prefix See Figure One for more explanation about the GS1 company prefix	123456
Item Reference Number Like the location reference number in Figure one, the item reference number is assigned by you for each unique item—it is five digits in this example.	12345
Check Digit The check digit is a calculated field that ensures data integrity when reading your Global Trade Item Number. You can have the Check Digit calculated for you at no cost at http://www.uc-council.org/checkdig.htm	8
Consolidated GTIN Additional GTINs would be created by changing the item reference number to identify additional items (UPCs) that your company would want to represent to the GS1 Global Registry and your trading partners.	0123456 12345 8
<i>Source: GTIN Implementation Guide, Uniform Code Council, June 2003</i>	

For each level of your packaging hierarchy that you sell to a customer, you will need to identify a unique GTIN. This is done by using the GTIN-14 format and incrementing the first digit, also known as the packaging indicator.

Figure Three-Converting Your Packaging Hierarchy into GTINs

Packaging Indicator	0
The packaging indicator is a single digit that is pre-pended to the GTIN to indicate its position in the packaging hierarchy. There are no set assignments of pack sizes for the packaging indicator; rather the assumption is that a packaging indicator of '0' is the consumer unit, and each higher number represents the next level of your packaging hierarchy. If you use the GTIN-12 format for your consumer units, you will also need to add a zero to the front of the GTIN-12 before pre-pending the packaging indicator to create the GTIN-14.	
GTIN for Consumer Unit	0 0123456 12345 8
GTIN for Case	2 0123456 12345 6
GTIN for Pallet	4 0123456 12345 4
<i>Source: GTIN Implementation Guide, Uniform Code Council, June 2003</i>	

- **Determine which required attributes you have and their location**—Once you understand the required attributes, you will need to determine which of these you already store in your back-office systems or databases. You will also need to figure out if these attributes are in the appropriate format to pass GS1 Global Registry and your retailers' attribute validations. Finally, you will need to populate whatever input mechanism your solution requires; for example, if you are using a solution that takes a spreadsheet upload, you will need to consolidate this information on your solution provider's spreadsheet template.
 - **Devise a strategy to fill in any missing attributes**—There will most likely be some item attributes for which you do not currently keep data. For example, you may not have GTINs assigned for each item at all levels of the packaging hierarchy. Another example would be the Global Product Classification (GPC) code currently required by the GS1 Global Registry. You will need to determine who populates these new attributes and where; again, your solution partner may be the answer here if you are populating a spreadsheet or web form.
3. **If your retailer requires it, send your items to the test registry to validate proper data formatting prior to upload to the production GS1 Global Registry.** Just as the name implies, the test registry is meant to be a 'practice' prior to registering live data. Using the test registry gives you some experience up front; it can be difficult to correct mistakes in the production registry so it is advantageous to practice with the test registry. Use of the test registry may be optional. Your solution partner can help you with any process required by your trading partners.

4. **Leveraging your solution, send items to the GS1 Global Registry using the GDSN XML message standards over an AS2 communication.** Once you know how your solution partner transmits your items to the GS1 Global Registry—whether it is through a software solution in your environment, a hosted solution managed by you, or a service in which the solution provider acts on your behalf—make sure that you have insight into the status of the upload messages so that you can be assured of timeliness and success.
5. **Be prepared to respond to any errors generated by the GS1 Registry validations.** Even if you leverage the test registry, it is possible that there will be errors when you publish to the GS1 Global Registry. For this reason, be sure that you have someone in your organization responsible to handle error messages. Depending on your solution, you may be alerted by email or through a report of the error messages. Again, time may be of the essence if you are meeting a retailer deadline, so make sure to cover this part of the process with your solution partner.

Step 6 Synchronize Your Data

Once you have successfully loaded your items to a data pool and registered them with the GS1 Global Registry, your retailer will have the opportunity to subscribe to them, kicking off the synchronization process. You will need to publish to the retailer for the items they're subscribing to. At a minimum, suppliers need to understand:

- The specifics of how this happens in the solution that you have chosen. If you are using a browser-based hosted application, you may have 'grant access' or 'publish' commands in your user interface.
- Your retailer's item subscription process. There are several possible levels to which your retailer may subscribe—either by GLN, GTIN or by GPC code. Your solution partner or the retailer should be able to provide this information.
- There may be GDD attributes above and beyond the minimal requirements for GDSN that you need to transmit to your customer. These additional attributes, which could include GDD and Extended attributes, will be part of the publication process and should be considered during the data preparation you perform in Step 5 to upload your items your data pool.

Once you publish, your retailer has the ability to respond with a confirmation messages of ACCEPTED, REJECTED, SYNCHRONISED, or REVIEW. A REVIEW response for an item means that the retailer has found a discrepancy in the data and is requesting a change to the item data prior to accepting it. No response from the retailer, or any response other than REJECTED allows automated synchronization to occur. This means that whenever you modify an item through the GS1 Global Registry, your retailers will automatically receive an update

message. REJECTED means that the retailer no longer wants to receive any updates for that item, and future changes to that item will not be sent to the retailer.

Step 7 Send Additional Data Through a Portal or Email

Some retailers may require additional, retailer-specific information to be sent to them outside of the global data synchronization process. Typically this request will ask you to enter additional item attributes through a web portal or via a template that you email to the retailer. While this seems like an onerous process, you can save time by making sure you review and understand these requirements as part of the data preparation exercise you will go through to organize your items for your data pool and the GS1 Global Registry in Step 5.

Summary

If planned appropriately with the help of a knowledgeable solution partner, your customers' mandate for global data synchronization can be achieved without overwhelming expense or effort. For most small businesses this is the primary goal.

Once you have executed on the seven steps of your global data synchronization strategy, you may find the opportunity to learn how your customers plan to use this foundation of automated information exchange to expand to other collaborative activities with their suppliers. Some of these activities, such as price and promotions management, may directly benefit your business in terms of growth opportunities. If you would like to learn more about these potential benefits, take a moment to read some of the industry studies that have been published on global data synchronization mentioned in the References section of this white paper.

GXS is an experienced provider with a proven track record in solving business problems for retailers and their suppliers, and can help you plan and execute on a global data synchronization solution that meets your specific needs as a small business. To learn more about how our solutions can help your business, please contact us at www.gxs.com or 1-800-560-4347.

References

Industry Studies on Global Data Synchronization

Connect the Dots, Harnessing Collaborative technologies to deliver better value to Consumers, AT Kearney and Kurt Salmon Associates, 2004—
available at www.fmi.org/supply/Connectthedots.pdf

Action Plan to accelerate Trading Partner Collaboration, Data Synchronization Proof of Concept: Case Studies from Leading Manufacturers and Retailers, AT Kearney, 2003—
available at www.gmabrands.com/publications/docs/APcase.pdf

Reference Guides

GLN Implementation Guide, Uniform Code Council, 2002—
available at http://www.uc-council.org/lean_ucc_system/pdf/GLN.pdf

GTIN Implementation Guide, Uniform Code Council, 2003—
available at http://www.uc-council.org/lean_ucc_system/pdf/GTIN.pdf

Standards Organizations

GS1

www.gs1.org

Global Standards Management Process

<http://www.gs1.org/services/gsmpl/>

Industry Organizations

Voluntary Inter-industry Communications Standard (VICS)

www.vics.org

Grocery Manufacturers of America

www.gmabrands.org

Food Marketing Institute

www.fmi.org



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About GXS

GXS is a leading global provider of B2B e-commerce solutions that simplify and enhance business process integration, synchronization and collaboration among trading partners. Organizations worldwide, including 75 percent of the Fortune 500, leverage the GXS Trading Grid™ to extend supply networks, optimize product launches, automate warehouse receiving, manage electronic payments and gain supply chain visibility. With an unmatched global presence, proven trading partner management and B2B outsourcing services, GXS's on-demand solutions maximize the benefits of integration for businesses.

Based in Gaithersburg, MD, GXS's extensive global network serves customers throughout the Americas, Europe, the Middle East and Africa and Asia Pacific regions. GXS can be found on the Web at www.gxs.com.

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