



The GS1 Global Data Synchronisation Network: What you need to know

Updated December 2006

GS1 – The global language of business

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Introduction

Imagine, as a supplier or a retailer, that you could continuously align product, location and programme information with your trading partners.

Imagine that this information could be communicated to your trading partners through simple, fast and accurate transactions all along the supply chain allowing for the right amount of goods to become available at the right place at the right time.

Sound good? It is! These efficiencies are not imaginary. They are being achieved today by members of the Global Data Synchronisation Network®, companies that are seeing tangible benefits on both sides of the supply chain, such as reductions in out-of-stocks, and reductions in the amount of time it's taking to reconcile purchase order and invoice mismatches.

Your company can benefit, too – provided you decide to act now. If you don't, you stand to miss this unique opportunity to be best positioned in tomorrow's hyper-competitive global marketplace.

This document is an overview of what you need to understand about data accuracy, data synchronisation and the GS1 Global Data Synchronisation Network, including:

- Why synchronise data?
- The basics of global data synchronisation
- What is the GS1 GDSN®?
- How does the GS1 GDSN work?
- Five steps for synchronising data
- How to implement the GDSN
- Thoughts on getting started
- The GS1 System standards behind the GDSN
- Data quality and accuracy
- GDSN and the EPCglobal Network
- More information and implementation resources

Why Synchronise Data?

Today, trading partners are facing high and 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 portion of these costs. In addition, the globalisation of trade has generated an accelerated need for the smooth inter-company flow of goods and better control of supply chain processes, which can be achieved through synchronised communication among trading partners.

By continuously synchronising and harmonising master data between your systems and your trading partners' systems, you will ensure that master data is the same in all systems. This will allow you to trade locally, regionally and globally, increase data accuracy between you and your trading partners, and drive costs out of your supply chain.

Global data synchronisation is a robust foundation upon which the full benefits of electronic collaboration can be achieved and scaled. Electronic collaboration without data synchronisation will merely perpetuate the exchange of bad master data between trading partners.

Global data synchronisation is also a prerequisite for Electronic Product Code® (EPC®) Radio Frequency Identification (RFID). Without clean, synchronised master data, EPC and RFID technologies only enable faster transactions ... of the wrong information!

Even greater financial return is achieved as companies *expand* the scope of data synchronisation and collaboration. For instance, by synchronising price information as well as item and location information, you can further reduce costs within your supply chain. Due to the fact that the majority of non-quality orders and invoice deductions are due to inaccurate pricing information, the benefits related to order quality and invoice matching are even more pronounced.

The Basics of Global Data Synchronisation

In a trading relationship, you need to define

- WHO you are
- WHERE you are
- WHAT you have to trade
- In WHICH target market you'll be trading
- WHO you are trading with

To answer these questions, GS1 has developed **GS1 Identification (ID) Keys** – non-significant, secure and global unique numbers that support the identification of items, services, locations, logistic units and returnable containers.

The GS1 ID Keys most vital to data synchronisation are the **Global Location Number**, or **GLN**, the GS1 ID Key used to identify legal entities, trading parties and physical locations of items in the supply chain; and the **Global Trade Item Number** or **GTIN**, the GS1 ID Key assigned to any product or service that may be priced, ordered or invoiced at any point in any supply chain.

These keys have to be used properly by following GS1 System standards such as

- GTIN Assignment (e.g., How to assign a GTIN?)
- GTIN Allocation Rules (e.g., *When to change a GTIN?*)
- GLN Allocation Rules (e.g., *When to change a GLN?*)
- Bar Code or Radio Frequency Identification (RFID) specifications (e.g., *How is the key physically carried?*)
- Other rules (e.g., *symbol placement, physical package attribute, etc.*)

As the keys alone do not provide sufficient information, they are completed by attributes describing them, such as item or location (party) description, price, size, pack, name, address, etc. These standardised attributes that support trading partner relationships are called **master data** (*data which is relatively consistent across time, and common across multiple items such as the GTIN*) or **transactional data** (*data that is created during the physical flow of goods, such as the quantity of items in a purchase order*).

All of the information (*definition, format, etc.*) for all attributes is stored in a central repository that is called the **Global Data Dictionary (GDD)**. This ensures the consistent use of these attributes in all e-business standards developed by GS1.

Additional information about **GS1 ID Keys and Rules** is available at
<http://www.gs1.org/productssolutions/idkeys/>

What is the GS1 GDSN?

The GS1 Global Data Synchronisation Network, or GDSN is an automated, standards-based global environment that enables secure and continuous data synchronisation, allowing all partners to have consistent item data in their systems at the same time.

Various industry groups, including the Global Commerce Initiative (GCI) and GS1, drove the development of the GDSN concept in order to help streamline supply chain transactions and reduce supply chain costs.

The GS1 Global Data Synchronisation Network connects retailers and suppliers, via their selected GDSN-certified **data pools**, to the **GS1 Global Registry®**.

“It was in the year 2000 when we in the industry came together. We had a vision based on the idea that we had to do more collaboration. We were convinced that we should exchange data attributes between retailers and suppliers. We knew we needed a global system that could exchange data. That was the start of the GDS architecture.”

Ruud van der Pluijm
Vice President, B-to-B e-Commerce
Royal Ahold

GS1 Data Pools

GS1 certified data pools are electronic catalogues of standardised item data. They serve both as a source and/or recipient of master data, and can be run by a GS1 Member Organisation, supplier, customer, exchange or service provider. The latest list of GDSN certified data pools is always available on www.gs1.org/gdsn.

GS1 Global Registry

The GS1 Global Registry is the GDSN's "yellow pages directory" that

- Provides information for subscription sharing
- Enables data pool interoperability
- Guarantees uniqueness of the registered items and parties
- Ensures that all data pools in the network are complying with a common basic set of validation rules that support data integrity in the system
- Holds the information about who has subscribed to trade item or party data

Certification

The exchange of standard and proprietary information can only be achieved if all data pools and the GS1 Global Registry conform rigorously to certification standards for technological and operational performance so that the reliability and security of the entire network is commercially credible.

As a result, there are many criteria with which the data pools and the GS1 Global Registry have to comply to be **GDSN-certified** and, therefore, allowed to join the network. These criteria include

conformity to GS1 System standards, confidentiality and integrity of user information, plus interoperability. In order to be certified, data pools and the GS1 Global Registry have to comply with the Global Validation Rules, the Global Search functionality and the GDSN Certification Criteria.

Additional information about **certification** is available at www.gs1.org/gdsn in the "**Technical**" section.

How Does the GDSN Work?

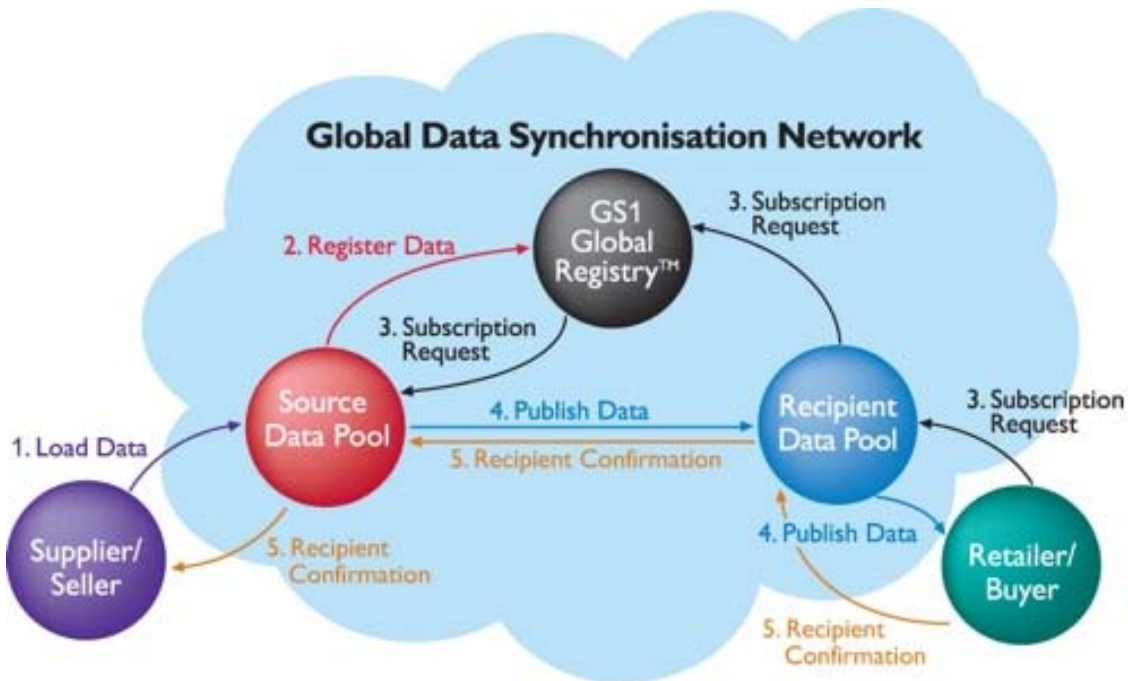
Within the GDSN, trade items are identified using the unique combination of the GTINs and GLNs of the data source (*the supplier, distributor or broker*) and target market (*the country in which the trade item or service is intended for sale*), while parties (all trading partners) are identified using a GLN.

The GDSN model used supports a network of interoperable certified data pools. Suppliers and retailers may have a single point of entry to the GDSN through a GDSN certified data pool; however, if the business needs of a supplier or retailer dictate multiple points of entry, this is also supported.

Suppliers and retailers access the GS1 Global Registry, via a GDSN certified data pool. No other access point to the GS1 Global Registry is needed.

Suppliers and retailers who want to synchronise item, location (*party*) and price data with each other should perform the **five steps** detailed on the next page.

The Five Steps to Synchronising Data



- 1. Load Data:** The seller (*data source*) registers product and company information in its data pool.
- 2. Register Data:** A small subset of this data is then sent to the GS1 Global Registry.
- 3. Subscription Request:** The buyer (*data recipient*), through its data pool, subscribes to a seller's GLN, product category (GPC), target market, or GTIN to receive the corresponding product and company information. Using the GS1 Global Registry, the data pool containing the requested item and location information is identified and the subscription is forwarded to that data pool.
- 4. Publish Data:** The seller's data pool then publishes the complete item and party information to the buyer via the buyer's data pool.
- 5. Recipient Confirmation:** The buyer then sends a confirmation to the seller through the buyer's data pool directly to the seller's data pool. More than simply an acknowledgement, it informs the supplier of the action taken by the retailer on the item information.

How to Implement the GS1 GDSN

We advise the following approach to implement GDSN within your organisation:

Step 1: Establish a core business team

- An executive/business sponsor, for commitment and business perspective
- Business subject matter experts, for business processes
- Technical resources, for day-to-day functionality

“The number-one thing that we advise people starting a data synchronisation program is that this is a business project, not an IT project, so you need to get your business leaders engaged. ”

**Marianne Timmons,
Director of B-to-B,
Wegmans Food Markets**

Step 2: Gather implementation information

- Assemble technical documents and implementation information
- Get involved in the GDSN User Group
- Download the latest Certified Data Pools list

Step 3: Build an implementation team

- Choose a Certified Data Pool that has successful implementations (*ask for references*) and addresses your needs. A full 2005 Data Pool certification report issued by the independent certification agent, The Drummond Group, Inc, is available on the GS1 GDSN website at www.gs1.org/gdsn.

Step 4: Locate your data

- Clean your data! Accurate data is essential to a successful programme. (See *information on the Data Quality Framework, later in this document.*)
- Ensure you have a Global Location Number (GLN) and Global Trade Item Numbers (GTINs)
- Do NOT underestimate this step!

Step 5: Migrate to Production

- Add clean product information into your Data Pool
- Establish a relationship with your trading partner to synchronise item information. Understand their requirements.
- Add any required (*industry or retailer specific*) additional data attributes and transmit to chosen trading partner
- Develop a roll out plan for other trading partners

Additional Thoughts on Getting Started

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 company structure.

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

Ensure that your company and your trading partners have adopted the GS1 GTIN, GLN, Global Data Dictionary (GDD) and Global Product Classification (GPC) standards.

Clean up internal data catalogues and ensure that you are able to send/receive all data attributes (master data) to and from your trading partners in a Global Data Dictionary-compliant structure. This step is critical and should not be underestimated, as several studies have shown that this process could take from several months to several years

Ensure that your internal or third party data pool is GDSN certified and interoperable in the GDSN.

Subscribe to the GS1 Global Registry by executing a “GS1 GDSN, Inc. Terms of Participation Agreement” through your chosen data pool.

Start working with a few key items and with 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

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

“If you are starting a data synchronisation program, you need to focus on the three main issues: the process, the people, and the information technology.”

Ruud van der Pluijm
VP, B-to-B e-Commerce
Royal Ahold

“We've seen a variety of business benefits ranging from improved accuracy of orders that we've received from our trading partners, as well as some real breakthroughs in the work process of new item forms, which we've been able to eliminate with some more innovative trading partners; and generally just a greater level of confidence in the information that we're passing to our customers.”

Milan Turk
Managing Director
of Customer e-Collaboration
Procter & Gamble

Support the drive towards industry-wide participation by encouraging other trading partners and companies to join the GDSN by sharing your results, publishing case studies and participating in the GDSN User Group and Regional GDSN User Forums.

More information about getting started is available at www.gs1.org/gdsn

Why Implement GDSN?

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

- ensures that trading partners work in a standardised way, thereby reducing duplicate systems and processes
- ensures that item data is updated and consistent between trading partners
- validates accuracy of data against standards and business rules
- ensures that trading partners classify their products in a unique, standardised way (Global Product Classification)
- provides a single point of entry for retailer and supplier trading partners (their chosen Data Pool), so reducing the cost of operating multiple solutions
- guarantees uniqueness of item (product, case, pallet), party and location through the GS1 Global Registry
- certifies that Data Pools and the GS1 Global Registry comply with GDSN rules

In a 2003 case study performed by Cap Gemini under the leadership of the Global Commerce Initiative (GCI) Steering Group, it was demonstrated that adopting and implementing a global data synchronisation programme would lead to a **one to three percent savings in supply chain costs. Long-term benefits were expected to be even greater**, as GDS is a cornerstone for large-scale implementation of collaborative business processes and also for the Electronic Product Code/Radio Frequency Identification (EPC/RFID).

Additional information about the **2006 Accenture report** is available at www.gs1.org/gdsn in the "**Reference Library**" of the "**Implementation**" section.

A 2006 Accenture report entitled "*Synchronization—The Next Generation of Business Partnering*" demonstrates that those earlier projections were correct, and were in fact conservative. **This study clearly confirms that companies that take action are making progress and achieving real results with global data synchronisation.**

Suppliers and retailers that have collaborated and taken an integrated approach to data synchronisation have realized **even greater benefits** than originally expected.

In 2005, GCI and CapGemini conducted a study entitled, “*Global Data Synchronisation at Work in the Real World: Illustrating the Business Benefits*”, and found that:

- Dutch retailer **Albert Heijn** improved productivity in their data management department by 30%.
- **Wal-Mart** decreased item maintenance from 15-30 days to 1 day.
- **Gillette Venezuela** improved order-processing productivity and eliminated master data discrepancies by aligning product information with their trading partners.
- **Johnson and Johnson** decreased out-of-stocks by 2.5% by virtually eliminating data integrity issues.
- **Procter & Gamble** increased purchase order accuracy by 3% by focusing on aligning obsolete products with **La Fragua** in Guatemala.
- **Unilever Columbia** significantly reduced data inconsistencies and improved new item speed to market by 2-3 weeks.
- U.S. retailer **Wegmans Food Markets** increased store sales by reducing speed to market on new items by two weeks.

Implement Now!

These case studies all show that cleansing your data and ensuring compliance with GTIN and GLN allocation rules result in immediate and important cost savings. Integrated, collaborative trading relationships are key to succeeding in tomorrow’s global, hyper-competitive marketplace.

Start improving your relationship with your trading partners now.

By successfully embracing data synchronisation today, you will be in the best position to create sustained business value in the future for yourself and your trading partners. GDS is happening now; join before your trading partners call you to action.

“The GDSN has more than 10,000 members and over 1,000,000 GTINs registered today, and that is more than just a number. It shows real momentum. We've seen as well the number of items in the Registry increasing. This reflects how many suppliers are posting item information and how many retailers are interested in that data! We're seeing the activity and the transactions in the network now, and that's the most significant point. It's not theory, it's not projections. It's real demonstrated value.”

Sally Herbert
President, GS1 GDSN

The GS1 System: The Standards Behind the GDSN

The Global Standard Management Process (GSMP) of GS1 develops the standards needed to support the Global Data Synchronisation Network (GDSN).

For each standard, the GSMP provides two different components: **Business Message Standards (BMS)** and **Extensible Markup Language (XML) Schemas**. While the BMS contains all necessary information to implement the electronic messages, the XML schemas are the messages themselves in electronic format.

A complete listing and detailed explanations of these GDSN standards are available at www.gs1.org/gdsn in the “**Technical**” section.

Other GS1 System standards involved in the GDSN include the Data Synchronisation Data Model for Trade Item, Catalogue Item Synchronisation, Basic Party, Global Validation Rules, Standard Attributes, Fast Track Attributes and Extended Attributes

GLNs and GTINs are two other GS1 standards necessary to the data synchronisation process. The **Global Location Number (GLN)** is a 13-digit unique location number mandatory within the GDSN to identify data owners/information providers, such as distributors, brokers, and manufacturers, as well as legal entities and physical locations. The **Global Trade Item Number (GTIN)** is a 14-digit number used to uniquely identify a trade item where there is a need to retrieve pre-defined information. The trade item may be priced, ordered or invoiced at any point within the supply chain.

One of the GS1 standards that plays a key role in the GDSN is the **Global Product Classification (GPC)**, which 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.**

Global Product Classification (GPC) is part of the GS1 System and a key enabler for the GDSN and category management. All current published GPC content is available free of charge, without any usage restrictions at www.gs1.org/gpc.

The **Global Data Dictionary (GDD)** is a repository for all data attributes developed to support the GS1 Business Message Standards (BMS) and GS1 XML Standard Schemas. It 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), XML and Automated Identification Codes (AIDC). The GDD can be accessed at <http://gdd.gs1.org/gdd>.

Data Quality and Accuracy

Ensuring that the data used is accurate is essential to a successful data synchronisation programme. Indeed, good quality data – data that is complete, consistent, accurate, time-stamped and industry standards-based – is foundational to collaborative commerce and global data synchronisation.

To help improve the quality of data used across the GDSN, GS1 and The Global Commerce Initiative (GCI), along with representatives from suppliers, retailers and industry associations, worked together as a team to establish “**The GS1 Data Quality Framework**,” which incorporates a data quality management system to validate the existence and effectiveness of key data management business processes. In addition, it offers several options to show compliance, by offering rules for self-declaration and an inspection procedure to physically validate product attributes.

Additional information about the **GS1 Data Quality Framework** is available at www.gs1.org/gdsn in the “**Implementation**” section.

“At Kraft, good data is so important to us. For example, if we put the number for 'depth' in the 'width' column, the retailer is not going to put our product in the right place, and it won't fit. So we've learned through experience that getting the data right, country by country, is critical to our success.”

Hugh Roberts
President, International Commercial
Kraft Foods

The GDSN User Group

To make it easier for users in all regions of the globe to add the functionality they need to make the GDSN work for them, GS1 GDSN Inc has created a **GDSN User Group**.

The GDSN User Group's objective is to raise awareness of the business value of the GDSN, include local and regional needs in the development of business requirements, help early adopters get started, drive implementation, and facilitate the sharing of knowledge and best practices, and responsible for prioritizing the GDSN development roadmap

Additional information about the **GDSN User Group** is available at www.gs1.org/gdsn in the "**Implementation**" section.

Through conferences calls and physical meetings, members of the GDSN User Group contribute to local requirements through participation in work groups, make sure the standards support the business needs of their community and exchange ideas with other companies who are also implementing GDSN.

GSDN and the GS1 EPCglobal Network®

The GS1 EPCglobal Network® is a GS1 standards solution that enables trading partners to engage in the capture, sharing and discovery of Electronic Product Code (EPC)-related data through the use of standards-based hardware and software components.

As two parts of the GS1 portfolio, the GDSN and EPCglobal Network are **complementary solutions**, fulfilling the GS1 vision for a comprehensive approach to sophisticated collaborative commerce.

A **roadmap** showing the link between the GDSN and the EPCglobal Network is available on www.gs1.org/gdsn in the "**Implementation**" section.

The GDSN and data synchronisation ensure that **trade item information** about a product (*such as dimensions, descriptions, GTIN, price*) is accurate across trading partner systems at any given point in time. The EPCglobal network tracks the **whereabouts** of products at any point in the supply chain. The two are extremely powerful together. For example, RFID can locate a razor between supplier and retailer within the supply chain, but if the dimensions, description, or price data for that razor has just changed, then the retailer's organisation systems will not match what has just been received.

The GDSN improves the many business processes related to commercial transactions through data registration, standards compliance and data synchronisation. This increases data accuracy and drives costs out of the supply chain. The EPCglobal Network improves the many business processes related to supply chain visibility by enabling trading partners to capture, share and discover EPC data. This reduces costs related to lost or missing items, product recall and order fulfilment orders and provides opportunities for improving warehouse management and inventory tracking.



	GDSN	EPCglobal Network
Business Use	Collaborative e-commerce	Supply chain visibility
Mission	Ensure information quality between trading partners	Track and trace the physical movement of items
Primary Functions	Data synchronisation and GS1 System compliance validation , as a foundation for collaborative transaction management (B2B electronic commerce)	Records supply chain history with events and states changes, enabling real-time supply chain visibility over the Internet
Type of Information	WHAT and WHO: Item, price and party master data GTIN (what) and GLN (who)	WHEN and WHERE: Instance-specific information, the unique identification of individual items using serialised EPCs

For more information on the **EPCglobal Network**, visit www.epcglobalinc.org



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