



The Global Language of Business

Foodservice

Data Quality Guide

GS1 US Foodservice Data Quality Subgroup

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About GS1

GS1® is a neutral, not-for-profit, global organization that develops and maintains the most widely-used supply chain standards system in the world. GS1 Standards improve the efficiency, safety, and visibility of supply chains across multiple sectors. With local Member Organizations in over 110 countries, GS1 engages with communities of trading partners, industry organizations, governments, and technology providers to understand and respond to their business needs through the adoption and implementation of global standards. GS1 is driven by over a million user companies, which execute more than six billion transactions daily in 150 countries using GS1 Standards.

About GS1 US

GS1 US®, a member of GS1 global, is a not-for-profit information standards organization that facilitates industry collaboration to help improve supply chain visibility and efficiency through the use of GS1 Standards, the most widely-used supply chain standards system in the world. Nearly 300,000 businesses in 25 industries rely on GS1 US for trading-partner collaboration that optimizes their supply chains, drives cost performance and revenue growth while also enabling regulatory compliance. They achieve these benefits through solutions based on GS1 global unique numbering and identification systems, barcodes, Electronic Product Code-based RFID, data synchronization, and electronic information exchange. GS1 US also manages the United Nations Standard Products and Services Code® (UNSPSC®).

About Foodservice GS1 US Standards Initiative

The Foodservice GS1 US Standards Initiative serves as a strategic effort in which industry trade associations and individual companies may choose to join on a voluntary basis to assist with their company's adoption and implementation of GS1 Standards. Nothing herein should be construed as constituting or implying an agreement among foodservice companies to adopt or implement GS1 Standards. Nothing herein should be construed as constituting or implying an agreement regarding any company's prices, output, markets, or dealings with customers and suppliers. Nothing herein is inconsistent with the proposition that each participating company must and will exercise its independent business judgment on all standards adoption.

1 Executive Summary

Inaccuracy of foodservice product information is not a new phenomenon. Although it clearly adds confusion and complexity for trading partners, it was often viewed as simply a cost of doing business. However, those costs eventually became too high for some trading partners as they realized the toll that data inaccuracies take on simple order-to-cash business processes. Some demand-side trading partners tried to deal with the issues themselves, reviewing product information provided by suppliers and “correcting” any inaccuracies in their own systems. Although this may have “fixed” a piece of inaccurate data in one system, it meant that supply-side and demand-side trading partners were no longer using the same data. Plus, this approach added new layers of complexity for supply-side trading partners as they discovered that different customers were using their own different “versions” of product information.

The foodservice industry needed a new approach. The Foodservice GS1 US Standards Initiative (“Foodservice Initiative”) began in 2009 to help the foodservice community address the data issues that increase costs for manufacturers, distributors and operators. It was clear that all trading partners have a role to play: manufacturers need to do their part as data sources, and data recipients need to do their part to keep data aligned and clean in their systems. Past experience had shown that resolving foodservice data issues would take an industry approach to:

1. Align trading partners around the same set of product information, and
2. Promote data quality and accuracy.

For the first challenge, the Foodservice Initiative recommended that foodservice trading partners use the GS1 Global Data Synchronization Network™ (GDSN®) to share product information. The GDSN provides a common set of attributes, one common format for those attributes, and one point of connectivity (i.e., their GDSN-certified data pool). The GDSN uses an efficient, automated approach to data-sharing to align product information across IT systems and among trading partners, and to keep that information up-to-date.

To address the second challenge, the Foodservice Initiative established the Data Quality Subgroup to examine and address data quality issues in the foodservice supply chain. Eventually, it became apparent data quality had become an issue across many industries, and GS1 US began working with a cross-industry discussion group to establish a common approach to data quality and data governance. The foodservice Data Quality Subgroup supported that effort, which ultimately produced the *GS1 US National Data Quality Program*. The foodservice Data Quality Subgroup also created the *Issue Reporting & Resolution Process* to provide a process for how foodservice trading partners should manage data issues.

Based on this work, the Foodservice Initiative has defined an industry-wide approach to data quality that leverages advancements in technology and the evolution of thought to promote and maintain data quality across the foodservice industry. This four-prong approach includes:

- **GDSN:** *to electronically share high quality product data in a standardized way*
- **GS1 US National Data Quality Program:** *to understand and implement best practices for data governance and product data management within your organization*
- **Transparent Data Requirements:** *to communicate data needs and get on the same page with trading partners*
- **Data Issue Reporting & Resolution Process (including scorecards):** *to formalize a collaborative process for how data quality issues should be managed between trading partners*

This document introduces each of these components and identifies key resources for implementing them.

2 Document Information

2.1 Purpose of this Document

This document is intended to define an industry-wide approach to data quality that is based on GS1 Standards and Foodservice Initiative tools. This document introduces each component of the industry approach to data quality and identifies key resources for implementing them. In addition, foodservice-specific guidance is provided for each component where applicable.

2.2 Who Should Use this Document

This document is applicable to all U.S. foodservice industry supply chain roles, and all U.S. foodservice product categories (including foods and non-foods).

2.3 Roles Terminology

In referencing various parties, this document and the resource materials noted throughout use terminology related to supply chain roles, as well as terminology related to a party's role in the GDSN. To promote clarity, the table below provides definition of each term.

Foodservice Roles Terminology	
Manufacturer	The party that produces the food and/or non-food products. <i>(NOTE: "Manufacturer" and "supplier" are used interchangeably throughout this document.)</i>
Distributor	Company that provides food and non-food products to locations such as restaurants, cafeterias, institutions, hospitals, nursing homes and schools. Intermediary between manufacturers and the foodservice operator.
Operator	Those businesses, institutions, and companies responsible for any meal prepared outside the home. This industry includes locations such as restaurants, and hospital cafeterias, catering operations, and many other formats.
Brand Owner	The organization that owns the specifications of the trade item, regardless of where and by whom it is manufactured. This is the trading partner responsible for the integrity of the brand name. This is usually the Manufacturer, but may be the Distributor or Operator. <i>Foodservice Best Practice is that the Brand Owner has their own GS1 Company Prefix, and assigns the item identifiers (GTINs) and location identifiers (GLNs) to the products and locations they own or manage.</i>
Data Source	GDSN term for a company loading and publishing data through the GDSN, and managing response messages (from their data recipients) through the GDSN.
Data Recipient	GDSN term for a company receiving data and responding to the data through the GDSN.

3 Industry Approach to Data Quality

The assumption is that the data being shared through the GDSN is accurate, high quality data. Unfortunately, industry has discovered that this is not always the case, and that sharing bad data through the GDSN has ripple effects across the supply chain.

The Foodservice Initiative recognizes data quality as an industry issue for which all trading partners have a role to play: manufacturers need to do their part as data sources, and data recipients need to do their part to keep data aligned and clean in their systems. In order to help the foodservice community address the data quality issues that increase costs for manufacturers, distributors and operators, the Foodservice Initiative believes the industry needs a comprehensive approach to promote and maintain data quality.

Therefore, the Foodservice Initiative has defined an industry-wide approach to data quality that leverages advancements in technology and industry best practices to promote and maintain data quality across the foodservice industry. This four-prong approach includes:

- **GDSN:** *to electronically share high quality product data in a standardized way*
- **GS1 US National Data Quality Program:** *to understand and implement best practices for data governance and product data management within your organization*
- **Transparent Data Requirements:** *to communicate data needs and get on the same page with trading partners*
- **Data Issue Reporting & Resolution Process (including scorecards):** *to formalize a collaborative process for how data quality issues should be managed between trading partners*

Foodservice companies are encouraged to implement all four components of foodservice data quality. To support that effort, this document introduces each component and identifies key resources for implementing them. In addition, foodservice-specific guidance is provided for each component where applicable.

- ✓ **Note:** As with all GS1 Standards and solutions, this guide is voluntary, not mandatory. It should be noted that use of the words "must" and "require" throughout this document relate exclusively to technical recommendations for the proper application of the standards to support the integrity of your implementation.

4 Benefits of Data Quality

- Increases customer satisfaction by ensuring the **accuracy of product information** – including weights, dimensions, ingredients, marketing and nutritional information
- Strengthens trust and **collaboration** between trading partners
- Increases **supply chain efficiencies** and cuts costs by reducing errors
- Cuts delays as a result of **reduced measurement errors**
- Increases the **reliability and efficiency of product transportation** and delivery to warehouses and operator locations

5 GDSN

5.1 Overview

Foodservice trading partners are sharing their data through the GS1 Global Data Synchronization Network (GDSN). The GDSN offers a standards-based approach to (1) storing item information, (2)

validating that the information is properly formatted pursuant to GS1 Standards, and (3) keeping that information up-to-date.

The GDSN offers foodservice supply chain members one point of connectivity (i.e., their GDSN-certified data pool), one common format, and a common set of attributes. A key benefit of the GDSN is that it provides authoritative data sources to align product and supply chain partner information across IT systems and among trading partners.

The Foodservice GS1 US Standards Initiative considers use of the GDSN a core component for data quality.



Note: The assumption is that the data shared through the GDSN is accurate, high quality data. To assure this is the case, foodservice companies should also implement the other tools in this guide to promote and maintain high quality data, and resolve any data quality issues discovered.

5.2 Foodservice-specific Guidance for Data Quality

Data Sources:

- Before synchronizing through the GDSN, check with your trading partners to see if they have any additional steps or guidance you need to get started (e.g., Implementation Guides, Data Sync Supplier Information forms, etc.). (*Note: Some data pools post their Data Recipient guides on their public websites.*) See the [Transparent Data Requirements](#) chapter below for more information.
- **Private Label & Spec Items:** Work with Brand Owners (Distributors and Operators) to understand if they are expected to load and publish private label or “spec” items in the GDSN. In some cases, the Brand Owner will specify what attributes they expect from the Data Source (Manufacturer/Supplier).

Data Recipients:

- If you identify bad data in your systems, do not manually “correct” that data yourself in your systems. Data issues need to be resolved through the GDSN. If any issues arise, report the issue to the data source using the [Data Issue Reporting & Resolution Process](#) defined in this document. The data source can then resolve it and publish the corrected/updated information to you via GDSN.
- Include contact information so your suppliers (data sources) can contact your company directly to resolve data sync issues (CIC messages, etc.).

5.3 Key Resources

- [Getting Started with GDSN](#) (high level implementation guide for foodservice)
- [GDSN Foodservice Attributes Interactive Spreadsheet Tool](#) (foodservice attributes for GDSN 3.1)
- [Foodservice GS1 US GDSN Attribute Guide](#) (detailed guideline for foodservice attributes for GDSN Release 3.1, including examples and file sizes)
- [Foodservice Product Images Application Guideline](#)
- [GDSN Validations](#) (For a list of GDSN Validation rules, visit the [GS1 Global website](#).)
- [GDSN \(Release 3.1\) Trade Item Implementation Guide](#)
- [GDSN web page](#) (documentation about major releases with regular updates.)

6 The GS1 US National Data Quality Program

6.1 Overview

The *GS1 US National Data Quality Program* provides a comprehensive, cross-industry approach to data quality that organizations from any sector can adopt to promote the accuracy of product information received or retrieved by trading partners and consumers alike. This approach encompasses an overall program within an organization that includes institutional commitment to standards-based data, and processes to validate that consistent, complete and accurate information is being captured and utilized for both internal processes and external sharing. The program focuses on three pillars of data quality:

- Data Governance
- Education and Training
- Attribute Audits

Each pillar is discussed individually in this chapter.

The Foodservice GS1 US Standards Initiative considers the *GS1 US National Data Quality Program* a core component for data quality.

6.1.1 Foodservice-specific Guidance for Data Quality

- All supply chain roles (Brand Owners, Suppliers, Manufacturers, Wholesalers, Distributors, Receivers, Buyers, and Operators) should leverage this program.
- Establish a data quality team to oversee implementation of the program within your organization.
 - Your company's data quality team should include anyone who is involved in the oversight, maintenance, communication and use of data for business purposes. This includes professionals with responsibility for product data, master data management, data synchronization, research and development, sales and marketing, and operations (among others).
- Review the [GS1 US National Data Quality Program Framework](#) for an introduction as to the comprehensive approach to data quality and the three pillars.
- Attend a [GS1 US Data Quality Workshop](#) to learn about how to establish a strong data quality program within your organization.
- When ready, get certified by the *GS1 US National Data Quality Certification Program*:
 - The *GS1 US National Data Quality Program* offers companies the opportunity to obtain data quality certification. Certification can be attained by demonstrating proficiency in all three pillars of the program. Each pillar has defined criteria and thresholds used to measure the brand owner's performance. A company must achieve a passing score in all three pillars in order to receive certification. Certification demonstrates to your trading partners that you are an industry leader meeting the high standards of data quality stewardship.

6.1.2 Key Resources

- [GS1 US National Data Quality Program Framework](#) (overview of the program)
- [GS1 US Data Quality Workshop](#) (learn the steps required to establish a strong data governance program within your organization. GS1 US experts will guide you through the GS1 US National Data Quality Program, including the necessary steps to establish or enhance a data quality program for your organization with a standards-based framework)
- [GS1 US National Data Quality Program Certification Quick Start Guide](#) (step-by-step guidance and a summary of resources)

6.1.3 Data Quality ROI Tools

The GS1 US National Data Quality Program recommends that companies develop an ROI for one or two key pieces of data that can quantifiably illustrate the cost of inaccuracies, and conversely the benefit to be gained by resolving them. This approach enables companies to begin the journey toward data quality using targeted, incremental steps where positive ROI can be calculated.

To support that effort, GS1 US prepared a series of ROI tools to help companies calculate quantifiable ROI associated with certain attributes in order to justify a data quality program:

- [Data Quality ROI Calculator for Brand Owners: Transportation Costs & Case Dimensions](#)
- [Data Quality ROI Calculator for Brand Owners: Transportation Costs & Case Weight](#)
- [Data Quality ROI Calculator for Brand Owners: Warehouse Costs & Case Dimensions](#)

6.2 Data Governance

6.2.1 Overview

The first pillar in the *GS1 US National Data Quality Program* is data governance. Data governance formalizes accountability for data management across the organization and assures that the appropriate people are involved in the process. Data governance programs serve an important function within an enterprise: setting the parameters for data management and usage, creating processes for resolving data issues, and enabling business users to make decisions based on high quality data.

Data governance programs manage the actions, methods, timing and responsibilities for supporting master data within an organization. Whether you are a supplier sending data or a recipient receiving data, all parties must take ownership of the data they manage. A strong data governance program establishes processes and procedures to foster accurate, high-quality data and maintain it over time. It includes documented procedures that define all of the critical steps and handoff points for accountability.

The Foodservice GS1 US Standards Initiative recognizes data governance as a core component of data quality, and encourages organizations to download the free Data Governance Process Assessment Guide to examine their own processes.

6.2.2 Foodservice-specific Guidance for Data Quality

Data Sources:

- Implement formalized data governance programs pursuant to the *GS1 US National Data Quality Program* in order to promote data quality from the beginning.

Data Recipients:

- Verify that all systems across your organization that use and rely on information about products and trading partners use GDSN data. It is imperative that the GDSN is the authoritative source for all systems (e.g., sales and marketing, inventory replenishment and distribution systems, billing/accounts payable, barcode tracking and scanning systems, food safety traceability systems, performance reporting, etc.).
- Put policies and procedures in place to prevent users from manually editing the GDSN data in your systems. (GDSN data should only be updated via the GDSN.)
- Establish a process by which data issues discovered any system is reported to a designated group/person, and resolved through the GDSN and the [Issue Reporting & Resolution Process](#) defined in this document.

6.2.3 Key Resources

- [GS1 US National Data Quality Program: Pillar 1 – Data Governance Process Assessment Guide](#) (benchmarking your organization’s processes and areas of opportunity)
- [GS1 US National Data Quality Program – Data Governance Best Practice Guidance](#)

6.3 Education & Training

6.3.1 Overview

The second pillar in the *GS1 US National Data Quality Program* is education and training. Formal education and training on GS1 Standards (including GTIN Management Rules, Package Measurement Rules, and the GDSN) promotes comprehension and proper application of the standards. This is essential to assure that your organization has the knowledge needed to maintain high quality data for your operations and your trading partners.

An organization should assure that all parties responsible for product data are part of an on-going education program so that resources remain current as internal data governance processes and personnel change, and as GS1 Standards evolve.

The Foodservice GS1 US Standards Initiative recognizes on-going education and training programs as core components for data quality.

6.3.2 Foodservice-specific Guidance for Data Quality

- Key focus areas for education about GS1 Standards include:
 - GTIN Management
 - Package Measurement Rules
 - GDSN
- Key focus areas for foodservice-specific education include:
 - Foodservice GS1 US Standards Initiative data attributes for GDSN
 - GDSN Messages (see [Appendix B](#))
 - GDSN Message Flow (see [Appendix C](#))
 - The [Data Issue Reporting & Resolution Process](#) defined in this document

6.3.3 Key Resources

- [GS1 GTIN Management Rules](#) (which form the basis on whether or not a new GTIN needs to be assigned based on changes to an existing product, promotions, or new product introduction)
- [GS1 Package Measurement Rules](#) (which form the foundation for accuracy of physical dimensional data (i.e., weights and dimensions) by explaining how to properly orient and measure your products)
- [GS1 US Product Measurement Services](#)
- [GS1 US Package Measurement and GTIN Management Certificate Training – Browse our Events Calendar](#)
- [Foodservice Product Images Application Guideline](#)
- [Foodservice GS1 US GDSN Attribute Guide](#)
- [GDSN Foodservice Attributes Interactive Spreadsheet Tool](#)

6.4 Attribute Audit

6.4.1 Overview

An *Attribute Audit* is an assessment of select key product attributes to validate that the attribute information being shared with trading partners matches the physical product. A physical audit of the product compared to the most recent information shared about that product is the best way to validate that data governance processes and institutional knowledge exist to support an effective data quality program.

The quality of an organization's product information provides insight to internal challenges and/or opportunities within the organization's processes. The *GS1 US National Data Quality Program* uses attribute audits as one of the three pillars for achieving high quality data. In addition, companies conduct attribute audits on their own to monitor their data quality and/or their trading partner's data quality.

The Foodservice GS1 US Standards Initiative recognizes attribute audits as a valuable tool for identifying and resolving data issues, and for monitoring data quality.

6.4.2 Foodservice-specific Guidance for Data Quality

- Foodservice data recipients often audit attributes themselves when they receive data, physically measuring product they receive and comparing the results against the data their trading partner sent to them about the product. If there is a discrepancy, data recipients should follow the [Data Issue Reporting & Resolution Process](#) defined in this document.
- Foodservice data sources should conduct attribute audits on their own data as a form of self-assessment to gain insight about their own data quality, as well as internal challenges and/or opportunities within the organization's processes. This is a good practice for monitoring and maintaining data quality before a customer reports a problem.
- Use the [Foodservice Data Quality Scorecard](#) when auditing attributes. This tool is an Excel spreadsheet with pre-programmed formulas, analytics and charts. Users enter the data from their systems and the data they validate through physical examination, and then the tool identifies discrepancies (based on defined tolerances), analyzes the results, and provides statistics and charts about the quality of that data.
- Individuals that conduct/perform audits, whether for a data source or a data recipient, need to be fully educated on the associated standards.
- For Foodservice, the data comparison would be executed against the most recent version of data published in the GDSN for those products audited.
- When ready, undergo the GS1 US attribute audit and get certified by the *GS1 US National Data Quality Certification Program*.

6.4.3 Key Resources

- [GS1 US National Data Quality Program Framework](#)
- [GS1 Package Measurement Rules](#)
- [Foodservice Data Quality Scorecard](#)

7 Transparent Data Requirements

7.1 Overview

In its work to adopt and implement the GDSN, the foodservice industry came together to identify a standardized set of foodservice attributes to be shared in the GDSN. Beyond those attributes, some demand-side trading partners have additional attributes they need, and/or specific requirements for synchronizing data with them.

It is essential that data sources understand their trading partners' requirements. However, these requirements have not always been well communicated or easily-accessible. Some data recipients have created implementation guides to communicate their data requirements, contact information, etc. Nonetheless, the existence of such materials and where to access them has not always been well communicated either. In order to promote data quality, trading partners need to formalize and simplify the communication of trading partner data requirements.

The Foodservice GS1 US Standards Initiative considers clear and accessible trading partner requirements to be a core component for data quality.

7.2 Foodservice-specific Guidance for Data Quality

Data Sources

- The best approach is to populate all of the attributes recommended by the Foodservice Initiative when loading data into the GDSN. By loading the full data set, data sources will be able to meet most if not all of their trading partner's requirements without having to go back and load additional information. (See the [GDSN Foodservice Attributes Interactive Spreadsheet Tool](#) for the list of recommended foodservice attributes for GDSN.)
- Use GS1 US Attribute Explorer for Attributes: Attribute Explorer is an online tool to search and discover trading partner data attribute requirements. Data sources should use Attribute Explorer to access their trading partner's requirements.
- Trading Partner Implementation Guides & Forms: Before synchronizing through the GDSN, check with your trading partners to see if they have any additional materials you need to get started (e.g., Implementation Guides, Data Sync Supplier Information forms, etc.).
 - Some data pools post the implementation guides of their Data Recipients on the data pool's website.
 - Some companies that have supplier/customer portals post their guides and materials on their portal.
- Private Label & Spec Items: Work with Brand Owners (Distributors and Operators) to understand if they are expected to load and publish private label or "spec" items in the GDSN. In some cases, the Brand Owner will specify what attributes they expect from the Data Source (Manufacturer/Supplier)

Data Recipients:

- In order to promote data quality, formalize and simplify the communication of data requirements and/or additional materials.
- Use GS1 US Attribute Explorer to communicate data requirements: Attribute Explorer is an online tool to search and discover trading partner data attribute requirements. Data recipients should list their requirements in Attribute Explorer to provide a single point of access for data sources.

- Make implementation materials (e.g., Implementation Guides, Data Sync Supplier Information forms, etc.) easily accessible for data sources: post these materials on your data pool’s website (if they support that) and/or your own supplier/customer portal.
- Be sure to communicate contact information so that suppliers can work directly with the data recipient company to resolve data sync issues (CIC messages, etc.).

7.3 Key Resources

- [GS1 US Attribute Explorer](#) (an online tool designed to help trading partners search and browse standardized attributes as defined in the GS1 Global Data Dictionary through GS1 US Industry initiatives)

8 Data Issue Reporting & Resolution Process (including scorecards)

GDSN is the authoritative data source for foodservice trading partners. Data Source companies are sharing data with multiple Data Recipients. Occasionally, Data Recipients identify that data they received from the GDSN does not match the physical product. In order to promote data quality, any issue with the data should be resolved through the GDSN:

- **Data Sources:** resolve any issues found in the data you publish to the GDSN *in order to assure that GDSN remains the current, authoritative source for their data.*
- **Data Recipients:** If you identify bad data in your systems, do not manually “correct” that data yourself in your systems. Data issues need to be resolved through the GDSN. *The correct process is to report the issue to the manufacturer using the process defined in this chapter, and let the data source fix it in the GDSN and republish the corrected data to you.*

The Foodservice Initiative Data Quality Subgroup created the *Data Issue Reporting & Resolution Process* to give foodservice trading partners guidance on how to communicate and resolve data issues in the GDSN. The process has three components:

Data Issue Reporting & Resolution Process:	
Step 1: Report	Data Recipients send a CIC message in the GDSN to report the data issue to the Data Source. (Recipients can also follow up with additional communication to the Data Source using email and/or scorecards.)
Step 2: Research	Parties analyze the issue and research potential causes in order to resolve it.
Step 3: Respond	Data Sources communicate to Data Recipients about the progress and status of the issue resolution throughout the process, and publish the updated/corrected data in the GDSN.

The Foodservice GS1 US Standards Initiative considers the *Data Issue Reporting & Resolution Process* a core component for data quality.

8.1 Step 1: Report the Problem

The Foodservice GS1 US Standards Initiative recommends that data quality issues be reported electronically through the GDSN using of Catalog Item Confirmation (CIC).

Data recipients may also send scorecards or emails to the data source with the CIC details. However, because these methods are outside of the GDSN, they should be used as a supplement to the CIC, not a substitute.

The CIC provides a standardized message that:

- All GDSN-certified data pools are able to send and receive, and
- That can be shared between trading partner to confirm receipt and communicate the status of an item that has been synchronized through the GDSN.

8.1.1 Catalog Item Confirmation (CIC)

The Catalog Item Notification (CIN) is a GDSN message used to transmit new or updated trade item information from a Source Data Pool to a Recipient Data Pool (and then further to the Data Recipient) within the GDSN. After the item has been received, Data Recipients send a CIC to the Data Source. CIC messages are sent to Data Sources in response to New Items, Initial Loads and Changes/Corrections.

The CIC is a GDSN message generated by the Data Recipient (the "published to GLN") and sent to the Data Source to inform the Data Source of the status (or "state") of the GTIN(s) that were published in the CIN. Data Recipients indicate the "State" of the item in the header of their CIC message. There are four "states" for CIC response messages:

CIC State (GDSN 3.1)	Definition
Received *	File has been received by the Data Recipient, but no business decision has been made on the data.
Rejected	Data received, but will no longer be synchronized and updates will no longer be provided.
Synchronized	Data has been received and is integrated, or <i>synchronized</i> , by the Data Recipient.
Review	File has been received, reviewed, and a request is sent to the Data Source asking them to review their data and take action (applies to adds & changes/correct). The Data Recipient has received discrepant data which they cannot synchronize

Data recipients should send a CIC to the Data Source to report data quality issues. The Data Pool(s) for both the Data Source and the Data Recipient are responsible for maintaining a sync list which is a catalog of published Trade Item Hierarchies and their response states. Users should work with their data pool to understand how to access (send and receive) CIC messages.

Key Resources:

For additional information on CIC messaging, including CIC examples, CIC "States", Confirmation Status Codes, and Corrective Action Code Lists:

- [GDSN \(Release 3.x\) Trade Item Implementation Guide](#) (Section 13: CIC Response to CIN)
- [GDSN Validations](#) (For a list of GDSN Validation rules, please see the [GS1 Global website](#).)

8.1.2 Scorecards

For trading partners utilizing scorecards, data recipients may also send scorecards to the data source with the CIC discrepancy details. Trading partner scorecards can measure various values, and may even include a measurement for data "Completeness", which may mean one of three things:

- *Catalog Completeness* – Measuring if the supplier has sent all items which they currently sell or trade with that recipient
- *Foodservice Completeness* – Measuring if the supplier has sent all of the attributes outlined in the Foodservice Initiative attribute guide
- *Trading Partner Completeness* – Measuring if the supplier has sent all of the attributes required by the recipient. *Please note:* This may include additional GDSN attributes outside the Foodservice Initiative attribute list.

The Foodservice Initiative has created a [scorecard tool](#) to support data quality auditing and reporting. This scorecard is an Excel spreadsheet with pre-programmed formulas, analytics and charts that may be used by any trading partner. Users enter the data from their systems and the data they validate through physical examination into the scorecard, and the tool identifies discrepancies (based on defined tolerances), analyzes the results, and provides statistics and charts about the quality of that data. The foodservice scorecard is available on the [GS1 US Foodservice – Implementation Resources](#) page.

8.1.3 Email

Some data recipients have enhanced their CIC messaging by also sending an email to the data source company with the CIC details. This method is outside of the GDSN, and is managed by trading partners, and in some cases, their data pool and/or solution provider. Many trading partners are using this today as a follow up to verify that their suppliers have received, and are responding to, their data sync issues and questions.

8.2 Step 2: Research the Problem

8.2.1 Data Source

(Prioritize data issues based on volume and the date the item was last checked by either the data recipient or the data source.)

Begin by speaking with your trading partner to make certain you understand the potential issue and what the trading partner is receiving, and that it is not just a misunderstanding/miscommunication. Then, start at the beginning and look inside of your organization:

1. **“Follow the data”** internally and at your data pool:
 - Check with all of your data owners to verify that the data files are complete.
 - Check with your middleware to verify that the data has been passed to your data pool.
 - Check with your data pool to confirm that files have been received, validated and sent to the Global Registry and/or your trading partners.
2. **Check your data governance processes:**
 - Are these attributes on lockdown or did somebody have access to change it?
 - Check with all internal parties who have access to item data:
 - What has been added, changed or deleted?
 - Check timestamps for any updates.
3. **Talk to your internal teams or solution provider:**
 - Determine if there is truly a discrepancy in the audited data:
 - Work with your packaging teams to understand item weights/dimensions for full cases.
 - Check with the shipping warehouse for a physical measurement.
 - Work with marketing and sales teams to verify they have sent all of the extended data.

- Check with internal teams (e.g., quality, food scientists, regulations, nutritionists, product development teams, etc.) to confirm that all allergens and nutritionals have been shared.
- Determine if the issue is in your back-end system or in the data in the GDSN.
- 4. Check with your data pool:**
 - Make sure that what you sent matches what is reported as the issue by your trading partner.
 - Work with your data pool to understand what reports are available (i.e., what can you check on your own and what do you need their help with).
- 5. Confirm data sent between data pools:**
 - Did your data pool send the publication to the Data Recipient's data pool?
 - What did the recipient data pool send to the Data Recipient? Does it match what was sent?
 - What CIC messages and details were sent back from the Data Recipient (Recipient data pool to Source data pool)?

8.2.2 Data Pool

Understand if the file has been passed between data pools:

- What was sent outbound? What was received?
- Have they received an MDN AS2 message? Can data pool users access this information?
- Where can users start the search with their data pool?
- What is your data pool's frequency of CIC monitoring?

8.2.3 Data Recipient

- What are your internal processes?
- Do you receive the XML directly from your data pool or is there some middleware in between the GDSN and your back-end systems?
- Was there any sort of data transformation of the GDSN data since it was received?
- If measuring cases, are your tools properly calibrated? Have you re-measured or re-weighed to confirm your initial values?
- If there are still issues with the data and your trading partner responds back that it is clear on their end, then follow the steps [above](#) outlined for data sources to examine your data governance processes for the cause of the issue.

8.3 Step 3: Respond to Your Trading Partners

Once the issues have been researched, the Data Source should communicate their plans for updating the affected items.

Data Source:

- There is no GDSN response for Data Source companies to send back in response to CIC messages. Therefore, Data Sources need to make Data Recipients aware that work is underway.
- Inform Data Recipients when they should expect to see the "Change" messages through the GDSN so they can plan accordingly.

Data Recipients:

- If the Data Recipient has any middleware for data review, they will need to work with their solution providers to make certain that these changes are accepted and integrated into their back-end systems at time of receipt.

Both:

- Make sure to periodically review outstanding CIC messages and ask for updates accordingly.
 - Check with your Data Pool to see if there are any outstanding CIC messages.
 - Understand what notifications, reports, etc. are available from your data pool to manage CIC messages.

A Appendix: Checklist for Data Quality

All tasks on this list should be reviewed and managed by all roles in the supply chain.

Task Number	Task
1.	<p>Map out the data governance process across your organization.</p> <ul style="list-style-type: none"> ■ Where does your data come from? ■ Who has access to your data? ■ What permissions do they have? ■ Who is authorized to commit data to your systems? ■ Who has permissions to add/change/delete? ■ Is GDSN part of your data governance program?
2.	<p>Educate your teams.</p> <ul style="list-style-type: none"> ■ Do each of your stakeholders/data owners have the “right” education? <ul style="list-style-type: none"> ■ GS1 Standards ■ GTIN Management Rules ■ GS1 Package Measurement Rules ■ GDSN Data Attributes ■ Your internal data requirements
3.	<p>Audit your products.</p> <ul style="list-style-type: none"> ■ Should be ongoing – not a one-time event <ul style="list-style-type: none"> ■ <i>Suppliers</i>: post production, changes, ongoing ■ <i>Recipients</i>: in the warehouse; in the condition received
4.	<p>Synchronize products with your trading partners.</p> <ul style="list-style-type: none"> ■ <i>Suppliers</i>: share your item data with your customers via the GDSN ■ <i>Recipients</i>: request data from your suppliers
5.	<p>Communicate with your trading partners.</p> <ul style="list-style-type: none"> ■ When issues are discovered, work with your trading partners to understand the source of the issue. ■ Follow the Collaborative Resolution Process to understand the source of the issue, ownership, and timelines for resolution.

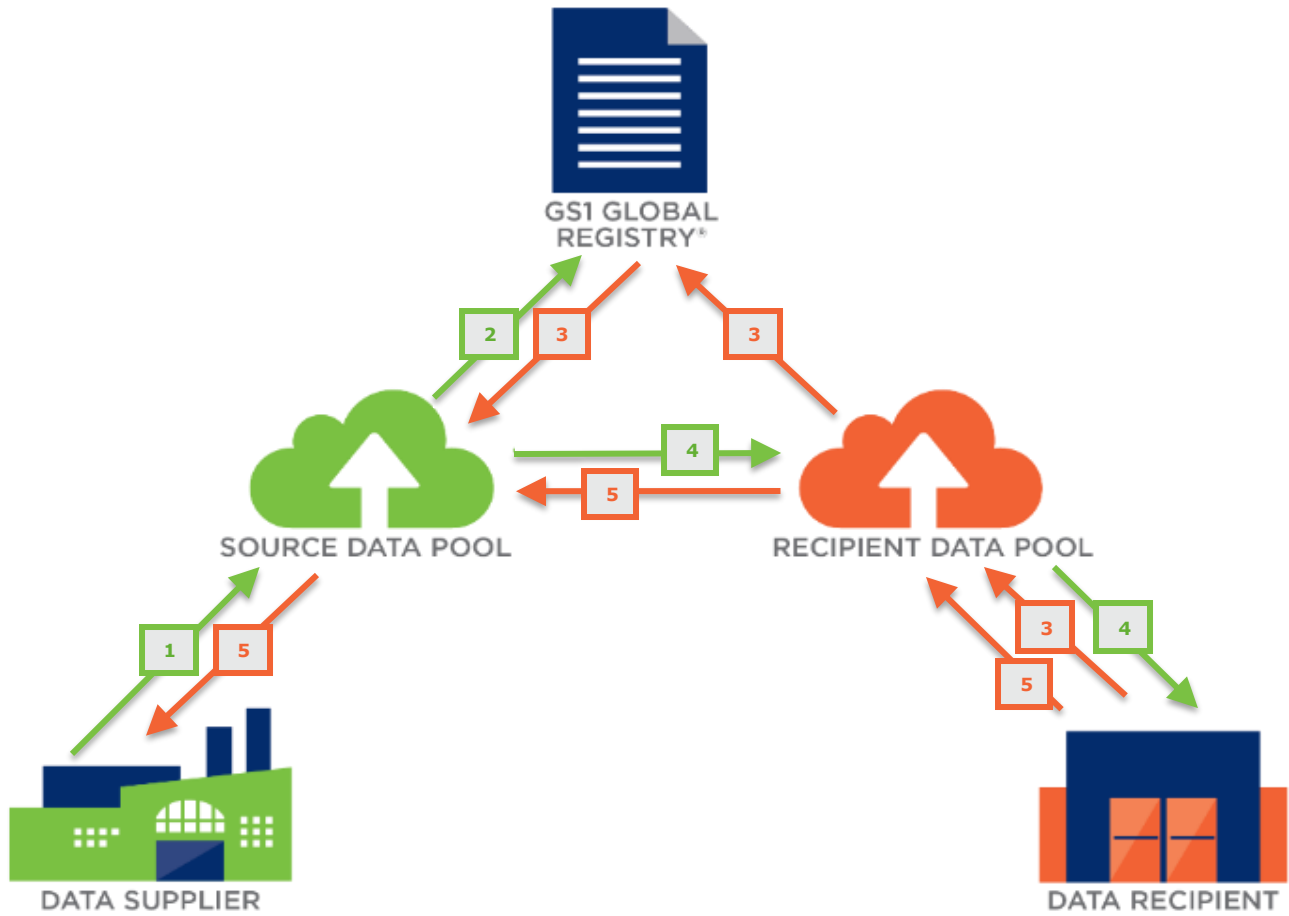
B Appendix: GDSN Messages for Data Quality

GDSN Messages		
1	CII - Catalog Item Information	Any item (product or service) upon which there is a need to retrieve predefined information and that may be priced, ordered, or invoiced at any point in any supply chain, and thus is stored in a catalog or data pool. Sometimes referred to as "Trade Item." In the GDSN, the catalog item is uniquely identified by the GTIN, Information Provider GLN, and Target Market.
2	RCI - Registry Catalog Item	A business message used to register basic Catalog Item information from the Data Source to the GS1 Global Registry via the Source Data Pool within GDSN.
3	CIS - Catalog Item Subscription	A business message used by the Data Recipient to establish a request for trade item information. The subscription criteria can be any combination of the GTIN, GLN, Target Market and GPC at the exception of the combination with GTIN and GPC that are mutually exclusive. The Recipient Data Pool will forward the CIS to the GS1 Global Registry. The GS1 Global Registry will forward the CIS to one or more Source Data Pools that have at least one item that matches the subscription criteria.
4	CI/P - Catalog Item Publication	A business message standard from the Data Source to the Source Data Pool to publish an item within the GDSN. The CIP can be used to publish the item to a specific Data Recipient or a specific Target Market.
5	CIN - Catalog Item Notification	A business message used to transmit new or updated trade item information from a Source Data Pool to a Recipient Data Pool and further to the Data Recipient within the GDSN.
6	CIC - Catalog Item Confirmation	A message standard that refers to electronic communication from the Data Recipient to the Data Source, indicating what action has been taken by the Data Recipient on the item. The confirmation process occurs in the recipient's data pool. Confirmation is not mandatory.



Note: The numbers in the first column correspond to the numbers in the *GDSN Message Flow* graphic on the next page.

C Appendix: GDSN Message Flow



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