



RVCF Business Process Guide for Item Master Data

March, 2026

Background

Previous RVCF Business Process Work Groups created two guidelines: [Error Prevention and Notification for EDI Ship Notices and Labels](#) and [RVCF Business Process Guideline for PO Changes](#). This ***RVCF Business Process Guide for Item Master Data*** focuses on issues and best business practices for Master Data Management (MDM), specifically for new item set up and item attribute maintenance. Our previous work identified incorrect item data is a significant cause for ship notice failure and the second biggest reason for Purchase Order (PO) changes.

About RVCF

The Retail Value Chain Federation (RVCF) provides platforms and opportunities for communication between retail industry stakeholders. They promote education through live events, teleconferences, webinars and research. They offer benchmarking of best practices, technology solutions, and strategic initiatives. RVCF works with retailers and merchandise suppliers to address their individual priorities helping them to become more collaborative trading partners. They are committed to the advancement of the retail industry as a whole. Contact RVCF at <mailto:Info@rvcf.com>

Services available include the *RVCF Clearinghouse* which will push retailer change notifications to the correct supplier contact. Changes include new store information (addresses and contacts), EDI maps, updated carrier and freight information, packaging and shipping guidelines, etc. The ability to receive Clearinghouse notifications is included in an RVCF membership.

Retailers and suppliers must take into consideration that this document was written at a point in time and business requirements evolve. Always verify business processes with your trading partner.

This document cannot be changed without express written consent from RVCF.

RVCF Business Process Guide for Item Master Data

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Section 1. Introduction

RVCF business guidelines focus on a specific business process and the use of digital communications including Electronic Data Interchange (EDI), portals, and emailed reports, photographs and videos.

Guidelines are created by an **RVCF Work Group** comprised of business and technical associates from retailer, supplier and solution provider companies. It is based on discussions during monthly work group meetings and a survey conducted by RVCF. For this guideline the survey response was 81 suppliers and 14 retailers.

Executive Summary – Why This Is Important

Master data at the item level has always been foundational in retail. Quality master data is now more important than ever. Consumers shopping online make decisions based on images, information and the ability to compare products. They buy based on compelling descriptions and product specifications including information about sustainability. They equate quality information with a quality product.

Two new technological trends in retail further underscore the importance of accurate, complete and up-to-date master data. Two dimensional barcodes on the consumer package will be used by the retailer at point of sale. More importantly, they will be used by the consumer to make the buying decision in the store and to provide information about the product after purchase. The item information and the on-line experience is provided by the supplier. It is an opportunity to give the consumer an exceptional on-line experience. Missing or incorrect data will negatively affect sales, the retailer/supplier relationship and the supplier's brand and image.

On the retailer's side, AI will be used to assist buyers by narrowing down which products to consider, and will perhaps even be a factor in the final buying decision. The item data will have to speak for itself.

See the Cost Analysis Matrix at the end of Section 2 to determine what incorrect master data may be costing you every month.

Purpose

The general purpose of the guidelines is to provide a resource for business associates on best business practices for populating and exchanging item master data, including various methods of digital communication, so they can take advantage of their capabilities and optimize business processes. It is also to provide talking points when communicating within the company, with trading partners and with solution providers. It identifies industry best business practices and makes suggestions to streamline and harmonize the various methods used to synchronize item master data.

Scope

The scope for this guideline is to identify best practices for new item induction from the merchandise supplier to the retailer and for continued item attribute maintenance to ensure master data synchronization between trading partners. The work group determined, for this guideline, that includes The following topics: common item attributes; images; cost of poor data quality; GS1 and GS1 US resources to improve data quality; and pros and cons for different data exchange methods.

Intended Audience

This guideline is intended for those in business operations such as vendor compliance, supply chain, transportation, ordering, shipping, receiving, accounts payable/receivable, EDI, and master data.

Highlights in the guideline include:

- Costs associated with incorrect master data.
 - Trading partners processing 50,000 PO's per month may be spending over a million dollars a month dealing with bad data.
- The data attributes which are difficult to get, often incorrect, and often changed are:
 - Package measurements
 - Would be Improved by using the GS1 Package and Product Measurement Standard.
 - Carton Configuration:
 - Can be communicated effectively and automatically with the EDI *Item Physical Details* segment in the PO, Advanced Ship Notice and Price/Sales Catalog.
 - Sustainability is a relatively new item attribute category; trading partners need to understand how to measure and certify consumer items and packaging for sustainability.
 - GS1 US is working on a pilot program to standardize language used and share sustainability information.
- The GS1 US *Best Practice Guideline for Exchanging Product Images and Attributes* includes updates for EDI, a common spreadsheet template, definitions for attributes, and classifications. It is freely available to all.
- Pros and Cons for various methods used for data exchange.
 - Data exchange methods which can be automated provide timely and accurate data.

Section 2. Challenges and Cost of Incorrect Master Data

Measuring Data Quality

Retailers and suppliers are aware of the issues associated with poor data quality. Being able to quantify and measure them will allow us to:

- **Justify allocating resources to improve the process**
- **Identify trading partners causing issues**
- **Determine if changes made have improved the process**

The cost of non-compliance charges, unavailability of product for the consumer, increase in PO changes, invoice issues, increased returns, and the cost of manual intervention justify the effort needed to keep the retailer and supplier's systems concurrent with accurate and timely item attribute data. See the matrix at the end of this section to see what incorrect master data is costing your company.

Issues associated with missing and incorrect data include:

- Buyer does not have enough information to buy
- PO cannot be created – critical data missing
- Negative effects for on-line sales:
 - Not enough information to post
 - If posted, insufficient information for the consumer; missed sales
 - Missing or poor images affect sales and returns

Ways to measure master data issues:

- Time to market for each retailer
- Time dedicated to incorrect master data resolution
- Percent missing required fields ("required fields" will be determined by each retailer)
- Number of PO Changes and failed invoices due to master data

Challenges

Single Source of Truth - A major challenge in exchanging item master data is that there is often not a single "source of truth" for the information. There is usually not a single area or department that is responsible for all item attribute data. Data may originate in marketing, research and development, manufacturing, regulatory / legal, supply chain, warehousing, transportation, planograms, and master data management.

A PIM system (Product Information Management) also referred to as PDM (Product Data Management) or MDM (Master Data Management), is an important tool for quality data management. It can be on-premise or cloud-based software or it can be SaaS (software as a service). The data is collected in the PIM where data validation can occur.

Best business practice is that one system becomes the source of truth for master data between intra company systems and external trading partners and a single department is responsible for accuracy.

Error Notification - When asked about error notification from either the retailer or supplier we learned there is not a common business practice. Notifying trading partners about master data errors in a timely, actionable manner is critical.

Currently the most common item master error notification is a failed production Purchase Order. A suggestion was made to use the EDI 855 PO Acknowledgement from the supplier to the retailer. The 855 has codes that can be used to denote the specific master data issue.

Automation - Automating the process of exchanging item attribute data is key. Retailers identified their biggest issue as the inability to automatically integrate the data due to different processes and formats from the supplier side. This leads to longer setup cycles and lost sales for both parties. As was determined from the survey and work group discussions, the EDI 832 Sales Price Catalog and Product (UPC) Catalog Services provide the best options for high quality master data exchange. These methods can be automated and have built in error-trapping routines that result in sending clean, harmonized data. To justify the cost of these methods it is necessary to identify the cost of late, incorrect and incomplete data.

An Example of Costs Associated with Master Data Issues

Let's look at the cost of processing PO Changes due to poor master data alignment between supplier and retailer. We know synchronizing data needs to be improved, but finding the dollars to put systems and resources in place is always an issue.

Retailers and suppliers can fill in the number of PO's they process per month, adjust the average time to fix a PO, and the average salary level for those working on the issue to get their estimated cost. **In this example if a retailer or supplier processes 50,000 PO's per month, it is costing them about \$1,310,692 per month to correct errors that could be prevented with a focus on exchanging accurate and timely data.** This is for both trading partners. Each side is spending about the same amount of time to fix the issue.

Cost of PO Changes Caused by Incorrect / Missing Master Data ¹	
Avg salary (various levels involved) ²	\$70,000
Salary factor for benefits, training, tools, etc.	1.45
Employee cost per year	\$101,500
Employee cost per work day (242)	\$419.42
Employee cost per hour (8)	\$52.43
PO's processed per month	50,000
% PO Changes due to bad data ³	20%
Hours to correct each ⁴	2.5
Labor cost per hour	\$52.43
Cost to fix per PO	\$131.07
PO's to fix per Month	10,000
Cost per month ⁵	\$1,310,692

¹ Master data includes fixed item and location attributes plus contractual attributes such as price and terms. It does not include PO changes due to an increase or decrease in quantity ordered.

² Departments involved include Customer Service, Sales, Purchasing, EDI, Merchandise Operations, and Master Data Management.

³ PO Change initiated by either the retailer or supplier.

⁴ Time needed to identify the issue; contact the trading partner; determine the correct attribute; fix data in the item/company master data tables; authorization to make PO change; resubmit the order; reprocess the order.

⁵ **Cost does not include chargebacks, unpaid invoices, lost sales, lost opportunity costs, increased returns and negative brand image.**

This is an example. Information based on discussions with retailers, suppliers, industry research, and surveys. Use your numbers to determine the cost of PO Changes due to incorrect master data.

Section 3. Standards and Guidelines

Many of the standards used by retail in North America are maintained by the American National Standards Institute (ANSI), GS1, and GS1 US.

[GS1](#) - The GS1 organization creates and maintains standards used world-wide to provide a common foundation for business. This includes guidelines for identification, barcodes, RFID, package and product measurements, images, and label formats. GS1 has member organizations in over 100 countries.

[GS1 US](#) is the GS1 member organization for the United States. They manage the assignment of company prefixes for US-based brand owners so they can create unique ID numbers for items, companies, and locations. GS1 US creates guidelines, certification and educational opportunities based on the GS1 standards applicable to the US.

[ANSI](#) manages hundreds of EDI transactions for many industries. Some transactions are used across industries, such as the PO and invoice, so there are many ways they can be configured while still following standards. EDI, in North America, is maintained by the ANSI X12 committee.

Both GS1 and ANSI state that participation in their standards are voluntary as reflected, in North America, by anti-trust and ability-to-compete laws. GS1 and ANSI work is comprised of recommendations and companies are free to make independent and competitive decisions for their business processes.

RVCF Role in Standards - RVCF helps trading partners understand and use the standards that exist today. If we identify changes that may benefit the retail industry, RVCF follows the change request process for the relevant standards body.

RVCF recognizes that there are many advantages to normalizing and harmonizing the way in which business data is exchanged in retail. Benefits are shared by both retailers and suppliers when processes are simplified and consistent. RVCF monthly forums provide an opportunity to exchange ideas about common and best business practices.

GS1 and GS1 US Resources

GS1 provides specifications and guidelines at the international level for all identifiers, including Global Trade Item Numbers (GTIN). A GTIN is the item identification number used, in North America, in a UPC bar code scanned at Point of Sale. GS1 guidelines include the following:

- [GTIN Management Standard](#) explains when an item changes sufficiently to warrant a new identification number – a new GTIN.
- [Package and Product Measurement Standard](#) explains how to measure and weigh a product. **Weights and measurements have been identified as the attributes that are most often missing or incorrect.** Inaccurate weights and measurements impact supply chain, transportation, merchandise display, shipping, and returns. Highlights include:
 - Determining the default front of a consumer trade item, so the height, width and depth can be determined making the measurement process consistent and repeatable.
 - Conversion factors (e.g. inches to millimeters; pounds to kilograms), decimal placement and rounding rules. **Best business practice is to always round up.**
 - Click [here to download the PDF](#).

[GS1 Global Product Classification \(GPC\)](#) provides a universal trade item classification system. This allows items to be grouped for searching, cataloging, and identifying item attributes needed for that group.

[GS1 General Specifications](#) provides information about identification keys (Global Trade Item Numbers, Global Location Numbers, etc.) and GS1 bar codes. It also includes an extensive glossary of terms.

GS1 US may offer a subset of the GS1 guidelines as they apply to the US. They have created a *US Apparel and General Merchandise Guide* **providing much needed standardization for attribute names, descriptions, exchange formats (EDI and spreadsheet) and images.**

The GS1 US [Apparel and General Merchandise Guide – Best Practice Guideline for Exchanging Images and Attributes](#) is a comprehensive guide for retail item attributes and images. The guideline is maintained by industry representatives, including retailers, merchandise suppliers, and third-party solution providers, who meet regularly to address current needs in retail. Benefits include:

- Rich item attribution and images increase on-line sales and reduce returns.
- Standardized processes and terms provide efficiency and lends itself to automating the item setup process.
- Faster product onboarding and accelerating seasonal launches.
- Easier mapping to Product Information Systems (PIM), Enterprise Resource Planning (ERP), Transportation Management (TMS) and eComm.

The *Apparel and General Merchandise Guide* now includes “Ask Apparel”, a new and free chat bot that allows users to directly ask their questions about images and attributes. The bot is reading the Best Practice Guideline for exchanging images and attributes. It can answer questions about specific item attributes or processes for sharing images. The chat bot is available on the GS1 US website along side the guideline.

The guide includes the following information:

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A standard spreadsheet for exchanging attributes between trading partners has been developed by GS1 US. More information and sample spreadsheets may be found on the GS1 US website at GS1 US Apparel and General Merchandise Attribute Template .		
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Section 4. Common Trade Item Attributes Used in Retail

Following is a list of common item attributes. There are many more attributes that may be required by retailers. Some of the descriptions are from the *GS1 US Apparel and General Merchandise Best Practice Guideline for Exchanging Product Images and Attributes*. Price and Terms are not included in this list. They are contractual rather than fixed attributes. GTIN master data may include *Manufacturer Suggested Retail Price (MSRP)* or *Cost to Purchase*. The price on a Purchase Order reflects the latest contract price and may include discounts for quantities ordered, promotions, and so on. It may or may not be based on attributes such as MSRP. Price and Terms are, of course, considered critical item data and must be aligned between retailer and supplier.

Validating the data before sending it to the retailer is critical to improving master data quality. Suggestions for validating attributes are included below.

Images

Statistics show that over 70% of shoppers rely on product images to make buying decisions on-line, plus images help reduce returns. Standardizing the terms and concepts for images reduces the number of images needed and simplifies onboarding with retail customers. The *GS1 US Apparel and General Merchandise Best Practice Guideline for Exchanging Product Images and Attributes* includes extensive information on image specifications, naming conventions, metadata guidance, code lists and EDI mapping for images. Image requirements include resolution, image types (e.g. front, left, right, back, top, detail); standard image file naming, and metadata tags for the image.

Trade Item Identifiers, Classifications, Descriptions and Configurations

Brand Name - The unique name given to a range of products for marketing and selling; a name recognizable to the consumer and differentiates the product from their competitors. May be different than the brand owner's legal name.

Brand Owner - The legal entity (company or organization) that owns the rights to a product. They develop and manage the brand. It may be a vendor / supplier or, in the case of own brands, the retailer. They can be identified with a GS1 Global Location Number, a unique number for a business or a location.

Country of Origin – The country where a product is manufactured, expressed using the 3-character International Standards Organization (ISO) Country Code. It may be on the consumer product label or packaging. There are rules for including more than one country. **Many suppliers list Country of Origin as an issue. For many retailers they are not able to indicate multiple countries of origin or the correct country of origin.** Also known as the *Country of Manufacture*. **Validation:** [make sure the correct ISO code is used \(3 letter ISO country codes\)](#). Rules are governed by the [International Trade Administration](#).

Advertised Origin – This is the “Made in the USA” designation as defined by the Federal Trade Commission (FTC). **Per the survey, retailers report this is a difficult attribute to get from the supplier.** See also, Country of Origin. **Validation:** [verify that the product meets the FTC Made in the USA Standard](#).

Descriptions – There are various description types and lengths including those used for receipts, retail and warehouse shelf tags, marketing, eComm and back-end systems.

Product Description – General is the primary description for the product. It is used by retailers for product selection and error resolution and should be detailed enough to aid in this process. Per GS1 US guidelines, the maximum length is 20 characters. Also known as the Item or Model Description.

Product Description – Full Product Name has a maximum character length of 40 and can be used for additional information for eComm to help consumers find a product. It can also provide information for buyers.

Product Description – Marketing Message is the description that consumers reference on eComm sites to understand a product's features, benefits and "why buy" value proposition. This attribute helps sell products by providing distinctive key words that can be used for searching. It can be hundreds of characters in length.

Size and Color Codes and Descriptions – Using the list of *Size and Color Codes*, maintained by GS1 US (previously maintained by NRF), the supplier assigns the codes. This gives retailers and suppliers a standard and common language for sizes and colors. **Validation:** [Make sure the codes and descriptions match the GS1 Code list found here.](#)

A Global Trade Item Number (GTIN) is a universally unique identification number given to a product. Per GS1 guidance, it should be the primary identifier for the product. A GTIN is used for ordering, shipping, receiving and invoicing. It is scanned at Point of Sale and used to look up pricing in the retailer's system. **Suppliers indicated that when a retailer uses their SKU or Product ID as the main item identifier it causes issues with getting the number from the retailer and maintaining internal cross reference files.** GTINs are assigned to a Consumer Standard Trade Item (consumer product) or Standard Trade Item Grouping (standard case pack). A GTIN is either 8, 12, 13 or 14 digits. GTIN-8 and GTIN-13 are assigned by brand owners outside North America. All are approved for use at Point of Sale in retail except GTIN-14 which is used for general distribution on a Standard Trade Item Grouping. A GTIN is made up of a GS1 Company Prefix or a U.P.C. Company Prefix, an item reference number and a check digit.* **Validation:** [using the Mod 10 Check Digit algorithm, verify that the Check Digit is correct. The Check Digit is in the right most position and it confirms that the number itself was keyed in or scanned correctly.](#)

The GS1 guideline for assigning GTIN's is the [GTIN Management Standard](#). It explains when an existing item changes sufficiently to warrant a new GTIN. Starting in 2019, GS1 guidelines state that "A GTIN allocated to a trade item shall not be reallocated to another trade item. This applies to all trade items, regardless of sector."

A GTIN-14 starts with 1 through 8. A GTIN that is 14 digits and starts with one or more zeros is a GTIN-8 or 12 or 13 shown in a "GTIN 14 format" used in some barcode types. The new 2D barcode used on the consumer package at point of sale is a GTIN-8, GTIN-12 or GTIN-13 in a GTIN 14 format.

GTIN Package Hierarchy - It is a best business practice to assign a GTIN to the components in a packaging hierarchy (e.g. carton or inner pack), when it may be warehoused, ordered, shipped, or invoiced in that configuration. A standard configuration may be X number of the same GTIN in an inner pack or carton or it can be a standard configuration of GTINs in certain sizes or colors. This is also known as a pre-pack or case pack. It is used to build the product hierarchy (parent / child relationship) for a product catalog. The GTIN may or may not appear on the physical trade item if it is not intended for Point of Sale. It may be used in an EDI 832 Price Sales Catalog, 850 PO or 856 Ship Notice Manifest.

*** Please see Appendix A for further information on Standard Trade Items, a Standard Trade Item Grouping, UPC-E / UPC-A (why you might want to have both the 8 and 12 digit representation of a GTIN in your item master), a GS1 Company Prefix, check digits, and Serialized GTIN (SGTIN).**

Packaging / Carton Configuration is the quantity and product mix in a given standardized packaging level, like a carton or inner pack. It is also known as the Pack Quantity. **Missing or incorrect data for this attribute has been identified as a major cause for shipping failures and PO Changes.**

Suppliers create standard carton content configurations for shipping, warehousing and inventory, however, it is critical to understand the retailer's expectations for quantities and GTINs in a pack or carton. A supplier can ship the right quantity, but if it is not in the carton configuration the retailer is expecting, it will cause an error and possible chargebacks. Information about carton configuration can be conveyed in an EDI Price / Sales Catalog, PO, or Ship Notice using the *Item Physical Details* (PO4) segment. It provides information about the GTINs and quantities in an inner pack, carton, or pallet load. **It is important for the both trading partners to read in and verify this data.**

Retailers use the carton configuration to optimize cross-docking cartons of product directly to stores or building a shipment to the stores using inner pack quantities. This eliminates shipping and receiving a mixed or partial pack which could increase manual work and cause errors for both the supplier and retailer. Carton configurations may be different for store replenishment and eComm orders. Errors occur when the wrong carton configuration is ordered or shipped. Carton configuration should reflect the supplier's minimum order quantity. **Validation:** includes simple checks to make sure the number of items is a whole number, the number of items in an inner pack and number of inner packs in a carton equals the quantity in the carton.

Minimum Order Quantity - The minimum order quantity is established by the merchandise supplier. This should match the carton or inner pack quantity to avoid shipping and receiving partial cartons.

Global Product Classification (GPC) Brick – This classification scheme follows GS1 guidelines and provides a logical system for identifying product categories. There are four levels: Segment, Family, Class, and Brick. The GPC at the Brick Level gives guidance for the additional attributes needed for that type of item. If a new GPC is needed, work with GS1 US. **Validation:** verify the classification and the correct Brick Number in the [GS1 GPC Browser](#).

Categorization was listed as an issue for retailers, both in identifying the correct category and getting the information from the suppliers.

Prop 65 - Proposition 65 requires businesses to provide warnings to Californians about significant exposures to chemicals that may cause harm. **Validation:** The list contains a wide range of naturally occurring and synthetic chemicals. Information can be found [here](#).

Retailer or Supplier Product ID – Often retailers and suppliers have their own product identifier in addition to the GTIN (which is assigned by the brand owner). It may be known as a supplier's internal item number, PID (product identifier) or the retailer's Stock Keeping Unit (SKU). Retailers use the SKU to track history for an item. Other terms include vendor part number, manufacturer number, and article number. Some Enterprise Resource Planning (ERP) systems automatically assign an article number when an item is set up in the system. Best business practice is to use the GTIN as the primary item identifier between trading partners to eliminate part number cross reference files which can cause confusion and delays. Additional part numbers, such as the retailer's SKU, can be item attributes.

Weights and Measures

Accurate and timely product measurements are needed for stock locations, shelf space, planograms, improving consumer satisfaction and reducing returns. They are critical for calculating freight capacity - fill the truck, but make sure there is room on a Less Than Truckload (LTL) shipment for all cargo. Weights and measures may be created and housed in the supplier's Warehouse Management System (WMS)

which may not automatically flow to their Product Information System (PIM). There is difficulty in getting accurate measurements for the manufactured item because the information, often, has to be set up in the retailer's system before the item is produced. Sometimes a prototype is measured and the supplier must re-measure the actual item and send updated information to the retailer. Several retailers indicated that when an item is received for the first time they weigh and measure it. This causes out-of-sync data between the supplier and retailer. Weights and measurements may be requested for the consumer item, both packaged and in its natural state, plus at the logistics packaging level (carton or pallet).

Per the retailers and suppliers, weights and measurements are the most difficult to get, most often incorrect and most often changed. **It was identified as the biggest challenge to accurate master data.** Both sides would greatly benefit from understanding the GS1 Package and Product Measurement Standard.

GS1 Package and Product Measurement Standard - when retailers and suppliers were surveyed about the GS1 package measurement rules, over half either did not answer the question or said they did not use them. **The value in using an international guide to determine weight and dimensions is that the results are consistent and repeatable. Two people with the same item and the same measurement instructions will calculate the same results.** Per the measurement standard, when rounding to the level of precision, **measurements are always rounded up.**

See Appendix C – GS1 Package and Product Measurement Basics for links to the GS1 measurement standard and for basics about how to measure and weigh products and packaging.

The measurements requested from the retailer may be for the **Consumer Trade Item with and without packaging, and for a standards logistics unit.**

Consumer Item Height / Width / Depth and Unit of Measure – These are the measurements for the consumer item. The supplier may need further guidance from the retailer. For instance, is the consumer item measured on a hanger or folded in a poly bag? **Validation: if measurements were taken pre-production, measure a product again after production.**

Consumer Package Height / Width / Depth and Unit of Measure – this is the measurement for the consumer item including packaging.

Consumer Package Gross Weight and Unit of Measure – This is the weight of the product including the packaging. Separate weight may be requested for just the consumer item. **Validation: if weight was determined pre-production, weigh the product again after production.**

Declared Net Contents - The amount of consumable product contained in a package, as declared on the label, which may be listed as weight, volume, count, units, etc. It is the net quantity of content or capacity of the consumer item. An example would be the number of loads for a given box of laundry soap. Also known as the *Consumer Product Capacity or Volume*. This is different than the "*Consumer Quantity of Units in Consumer Package*" which is a measure of the contents within a consumer package that is identified by a single GTIN. An example would be a package of 3 pairs of socks.

Sustainability

Both retailers and suppliers indicated on the survey that attributes around sustainability, textiles, fair trade, social, circularity, packaging, philanthropic, and traceability standards are now requested and in some cases required. They include:

- Packaging alternatives include moving away from plastic, using recyclable and eco-friendly materials and reducing packaging size.
- Using clean energy; reducing waste; maximizing shipping.
- A circular economy reduces the use of virgin resources, emphasizes reuse, remanufacturing, and recycling. It also includes designing products for use and reuse long term.
- Extended Producer Responsibility (EPR) puts the responsibility for designing eco-friendly products and the cost of product recycling on the suppliers.

[GS1 US](#) is working on a pilot project for standardizing the data and language used to share sustainability information between brands and retailers.

Section 5. Exchanging Item Attribute Data

There are various methods for exchanging and updating item attribute data and this section explores the pros and cons of each method.

EDI 832 Price Sales Catalog

EDI (Electronic Data Interchange) is a standardized form of digital communication using a structured language to convey business information between buyers and sellers. For more information on **EDI Basics for Retail**, click [here](#).

In general, EDI has many advantages including:

- Security in sending and receiving business information;
- Assurance that the document was sent and received by the correct party;
- The ability to automate outgoing transactions and incoming transactions for both trading partner's ERP systems;
- Basic validation that mandatory data elements are present in the data;
- While there will be differences in the specific EDI mapping that is used, once a transaction is implemented, a large portion of the work can be used for other trading partners.

An EDI 832 Price/Sales Catalog transaction is sent from the supplier to the retailer providing either new product data or updated product information. The list of item information that can be conveyed in an EDI Price/Sales Catalog is comprehensive.

The supplier may configure the 832 transaction based on the retailer's suggested mapping or use their own mapping which includes requirements unique to each retailer. That means there may be different EDI 832 configurations for each supplier / retailer combination, but once those EDI transactions are tested and integrated from and to each trading partner's systems, they usually do not change substantially, giving them the advantages of automatically exchanging data.

The 832 Price/Sales Catalog has the functionality to identify:

- A new product;
- Available dates for the product (first available; first ship date, availability notwithstanding)
- Attribute changes (partial or complete)
- Expiration/discontinue date
- Delete (one year after the expiration/discontinued date)
- Cancel (item never manufactured)
- Carton Configuration (inner packs/items in a carton) in the Item Physical Details (PO4) Segment.

An extensive implementation guide for the EDI 832 Price / Sales Catalog transaction can be found here [GS1 US Trade Item Identification and Communication Guidelines for Electronic Data Interchange](#). GS1 US has updated the transaction set to include the attributes needed in retail today. If additional attributes are needed, GS1 US can help facilitate that process.

Advantages include:

- Supplier can configure the 832 to include the attributes each retailer deems required for their systems and business processes.
- Separate 832's can be configured for retail stores and e-commerce, providing the information each business process needs.

- Can send both new product information and changes to existing products.
- Can be used to establish a discontinue date or a replacement item.
- Provides package hierarchy – pallet, carton, inner-pack, case pack, etc.
- Provides carton configuration and contents.
- For the retailer:
 - The ability to integrate data into their ERP / Product Information systems automatically.
 - Industry X12 EDI standards provide a list of codes for many attributes (e.g. unit of measure), which is used to validate the data.
- For the supplier:
 - The ability to integrate the data, automatically, from their “source of truth” into their EDI translator.
 - X12 EDI code lists means uniformity in the codes used for attributes.
 - They get an EDI Functional Acknowledgement indicating whether or not the retailer received the transaction, mandatory data was present and the retailer could translate it.
 - However, there may still be business errors within the document which can cause it to fail. The retailer must communicate that information to the supplier.

Disadvantages include:

- There is a startup and testing process that occurs between two trading partners when they exchange EDI for the first time, when they change something in a transaction, and when they add new EDI transactions to the trading partner relationship.
- There are costs associated with EDI including translation and transmission costs using either EDI software or a third-party EDI solution provider.

Product Catalog Services

Previously known as UPC or Item Catalogs, Product Catalog Services provide a way to synchronize item data between the merchandise supplier and retailer. The Product Catalog Service houses an item data repository and the supplier decides which retailer partners have access to the data. The supplier may give access to select GTINs, categories of products, or their whole catalog.

EDI is often used to load data to the repository and since this method is used by the supplier for several retailers, there is justification for automating the process, often using Application Programming Interfaces (APIs) to further ensure data completeness and quality.

The Catalog Service provider also validates data to make sure required elements are present and that qualifying codes match those used in the retail industry. Images can be included with the item data. Suppliers may provide a link to the image, or they may upload the actual image to the product catalog.

Advantages:

- This becomes the supplier’s single source of truth.
- Data format can be standardized for each retailer and include their mandatory requirements.
- The process can be automated.
- They have been in use for many years; it is a mature business process.
- They can help with GS1 package measurement rules, GTIN allocation rules, Global Product Categories, etc.

- They can validate data based on parameters according to industry code lists.
- Effective for trading partners exchanging large volumes of data.
- Supplier provides data once and it is available to many retailers.

Disadvantages:

- The retailer may not use the same catalog service as the supplier.
 - There may be an interoperability function between the supplier and the retailer's catalog;
 - Or the supplier has to use multiple catalog services.
- There is an initial setup time involved for both trading partners.
- There are costs associated with using a Product Catalog service.
- Some catalogs require a GTIN assignment for every item, even though they may never be sold.
 - GS1 guideline is that GTIN cannot be reused.
 - The process for assigning a GTIN can delay the setup process.

Check list for evaluating Product Catalog Services:

- ✓ Can the Catalog Service serve all retailers or just some?
- ✓ Does the Catalog Service provide item attribute validation specific to each retailer?
- ✓ What data formats does the catalog accept? Which ones do they recommend?
- ✓ Is there manual intervention or can an API call be set up to automatically take the data from the suppliers "source of truth" item master?
- ✓ Does the Catalog Service allow the use of custom attribute fields per trading partner?
- ✓ Is a GTIN required for item setup?
- ✓ Does the Catalog Service allow you to share data with Marketplaces so you can have a single source of truth for your production data?
- ✓ Can the Catalog Service synchronize with other data sources like PIMs, ERP, and other data synchronization services?
- ✓ Does the Catalog Service have API or bulk-import capability to provide real-time data and updates? If not, what is the time lag?
- ✓ Does the service support brick-and-mortar and ecommerce workflows (marketplace) with one feed?
- ✓ Understand the Catalog Service's pricing structure for connections, per-item cost, customization, images, and ability to automate processes (API routines).

Retailer-Hosted Portals for Suppliers

There are many portals that suppliers may use to lookup or exchange information, and they may all be called "Vendor Portals". **This section is specifically about a portal, hosted by the retailer, used by the supplier.** At one time these websites provided value – a place to communicate with suppliers. But as more functionality was added, the variations on how these portals work has made them less effective.

For a few retailers there are some applications for which there is no alternative but to use the portal. There are fewer opportunities to contact an individual about issues and questions.

On the retailer side, there is frustration because they feel they have answered questions plus provided training guides and videos, but the same issues persist. The suppliers are frustrated because they can't find the information they need and don't always know when something has changed.

In the survey several suppliers list retailer's portals as the single biggest challenge to exchanging master data. Many also indicate that the trend for new retailers is to use portals and spreadsheets. Mature retailers tend to use EDI and product catalog services but have to maintain some portal / spreadsheet capability for those suppliers not using EDI or catalogs.

Often there is a "public" side to the portal and a "private" side. Access to the private side is maintained by a provisioning infrastructure. Usually someone on the supplier side is given supervisory access and then allowed to delegate access for others in the company. The access may grant an individual read-only access, or read-write access (e.g. uploading item master data). Depending on the approval process, which again, is different for each retailer, it may take time for an associate on the supplier side to gain access. There should be backup personnel for critical jobs. It may be difficult to get access for third-party services upon which the supplier relies for some tasks. Have a process in place for removing access when an associate leaves their position or the supplier company.

Retailer requirements on the portal are best presented in a PDF or similar format, so that the supplier can view, read, and if needed, print and/or pass on the document to those needing the information. It is difficult to do this when information is part of a web page. It is important to have each document dated and to have some sort of versioning so the supplier is assured they have the most current information.

Some of the features of a retailer-hosted supplier portal include:

- Requirements documents for many things including packaging, purchase order processing, substitutions, hangers, shipping, transportation, legal, etc.
- EDI documents, which may contain, within the EDI maps, some of the business rules mentioned above.
- Scorecards
- The most current list of retailer stores including store numbers, addresses and contact information.
- Problem resolution platforms including submitting and tracking tickets for exceptions, issues, chargebacks, etc.
- **A way to send and/or update master data**
 - Manually key it in;
 - Use the retailer's spreadsheet template;
 - Upload a file from the supplier (usually a spreadsheet);
 - May or may not include a way to send images.

Advantages

- Retailers can post the most current business requirements and control access to sensitive information with passwords and provisioning.
- Suppliers have access to current requirements and scorecard information.
- The method used for sending master data may include some attribute validation from the retailer (e.g. acceptable unit of measure).

Disadvantages

- No two retailer portals work the same.
- There is no uniformity for finding business requirements.
- Suppliers are often unaware when something has changed.
- A retailer's announcement that something has changed is not specific enough to find the change.
- Documents are not dated.
- A change is announced but the document date is old or does not match the date given in the announcement.
- Exchanging item master data:
 - Subject to keying or upload errors.
 - Usually no indication that the file went through, or the retailer was able to use the data.
 - Spreadsheet formats are different from retailer to retailer, and even within a retailer portal, they may be different from day to day or for different retailer platforms.
 - Drop downs don't have the attributes / descriptors / classifications needed.
 - Some retailers require jumping between multiple portals to finalize item setup, especially for Ecom / Omni channel.
 - See, also, the disadvantages to using spreadsheets for item master data, in the section below.
- Retailer's portal may be down or not working properly.
- Frequent changes to the portal navigation and processes.

There are services available, such as the *RVCF Clearinghouse* which will push retailer change notifications to the correct supplier contact. Changes include new store information (addresses and contacts), EDI maps, updated carrier and freight information, packaging and shipping guidelines, etc. The ability to receive Clearinghouse notifications are included in an RVCF membership.

Exchanging Item Master Data in Spreadsheets

Spreadsheets have become a common business language for exchanging data, due in part to their simplicity and because many systems can export and import them. Suppliers may send spreadsheets via email or upload them using the retailer's portal. **They are perceived to be less expensive than EDI or Product Catalog Services, although they do not provide the same benefits.**

A spreadsheet may or may not be category specific, listing the attributes that are needed for that category, e.g. shoes versus linens.

Advantages:

- Most systems can import and export to a spreadsheet file format
- Most employees know how to use a spreadsheet

Disadvantages:

- Nothing in a spreadsheet exchange inherently assures security.

- When drop-down lists are provided, the one needed is not always there.
- May not provide the ability to control field length (min/max) and field type.
- May not provide the ability to require mandatory fields or validate data using parameters (e.g. measurements under or over a certain threshold for an item in a category).
- Cells not properly formatted will strip leading zeros that are needed in a GTIN, Product ID, UDEX Codes, ISO Country Codes, and so on.
- Spreadsheets have a “flat” database structure and lack hierarchical levels (parent/child relationships) for packaging levels.
- Every retailer or supplier's version is different (e.g. column headings / attribute names, etc.).
- May not provide for exchanging images.
- Spreadsheet macros, which may provide for data configuration, are not allowed, for security reasons, by some companies.
- May be difficult to convey item attribute changes / updates.

Appendix A – TERMS AND CONCEPTS

EDI (Electronic Data Interchange) is a standardized form of digital communication using a structured language to convey business information between buyers and sellers. It has been used successfully in retail for years and is likely to be used for many more.

EDI is made up of

- Segments of data (e.g. contact information)
- Data elements (e.g. a phone number)
- Qualifiers (e.g. this is a mobile number).

Industry groups can provide implementation guides on how segments, elements and qualifiers can be used in their industry. Additionally, existing code lists, such as the *Size and Color Codes* can be incorporated into the list of X12 EDI codes. Recent GS1 US work updated the *832 Price / Sales Catalog* EDI transaction to include the codes needed by retail today. Please see GS1 US, below, for a link to the *Guideline for Electronic Data Interchange*.

API (Application Programming Interface) is a tool that allows computer systems and software programs to "talk" to each other and share information automatically, following a set of rules. It allows systems to connect, share data and perform tasks automatically. For example, an API can verify that item attributes (like size or color) meet certain criteria; send or receive item information between supplier and product catalog provider; track and record activity for visibility and analysis. API technology has improved and is used to reduce manual processes and errors in day-to-day operations.

National Retail Federation (NRF) is the retail organization that created the *NRF Color and Size Codes* so the retail industry could standardize identification. *Color and Size Codes* are now maintained by GS1 US.

A Check Digit, also known as a Modulo 10 Check Digit, is the result of a mathematical formula used to calculate a digit from a series of numbers including the GTIN, Global Location Number (GLN) and Serial Shipping Container Code (SSCC). It is the right most digit in the number. Check digits are a part of the GTIN, GLN and SSCC and should always be included. They are used to verify that the number has been keyed, transferred or scanned correctly. The formula for calculating a check digit is in [the GS1 General Specifications](#).

Consumer Standard Trade Item: Any item (product or service) for which there is a need to retrieve predefined master data and that may be priced, or ordered, or invoiced. It is identified with a GTIN-8, GTIN-12 or GTIN-13. A consumer standard trade item is scanned at Point of Sale.

Standard Trade Item Grouping/Pre-pack/Set Pack/Standard Assortment: A predefined composition of trade item/s which may include a standard assortment of styles, sizes and colors or it may be a homogeneous carton filled with a quantity of the same GTIN. The Standard Trade Item Grouping is not intended for point-of-sale scanning but may be used for ordering, shipping, and receiving. It is identified with a GTIN-14, GTIN-13, or GTIN-12. Examples of a Standard Trade Item Grouping include inner pack, case pack or unit load (pallet) when the configuration is standardized for the contained trade items, and, again, not intended for Point of Sale.

UPC-A and UPC-E: Both a UPC-A and UPC-E barcode symbol carry a GTIN-12. A UPC-E symbol is smaller, showing eight digits in the Human Readable below the barcode. It is used on small or round consumer items. To create this symbol, the company prefix and the item reference number must have a predefined number of zeros within the GTIN-12. Four of the zeros are suppressed (based on the GS1 algorithm) to create a smaller barcode. But the data encoded and decoded is the GTIN-12. The scanner uses the same algorithm to expand the number back to twelve digits.

Both the 8 and 12 digit representations of the GTIN can be stored in the item lookup database so when the cashier keys in eight digits, the price for the item is found without having to use the algorithm to expand the data back to 12 digits. An example of the GTIN in a UPC-E barcode is 042100005264. The human readable below the UPC-E would be 04252614. The algorithm for encoding a GTIN-12 for a UPC-E is in the [GS1 General Specifications](#). When deploying new scanners make sure they are configured to read both UPC-A and UPC-E.

GS1 Company Prefix and U.P.C. Company Prefix: a unique number licensed to a company through GS1 US in the United States. It is used to create identifiers for a Global Trade Item Number (GTIN), Global Location Number (GLN), Serial Shipping Container Code (SSCC) and other GS1 Identifiers. If a company “buys” single GTINs without going through GS1 US, they are not licensed to use the Company Prefix needed for other identification including the mandatory Serial Shipping Container Code (SSCC) in an EDI Ship Notice.

Technically, the company prefix assigned in the US is called a *U.P.C. Company Prefix* and used to create a GTIN-12 encoded in a UPC barcode. Originally the US prefix was a fixed six digits, but now it is variable length and can be from six to nine digits. Adding a zero in the left most position of a *U.P.C. Company Prefix* creates the *GS1 Company Prefix* used to create other GS1 identifiers such as a Global Location Number (GLN) and Serial Shipping Container Code (SSCC).

When a company acquires another company, the terms of sale may or may not include transferring the license to use the company prefix originally licensed by the acquired company. GS1 US must be notified of the transfer.

Serialized GTIN (SGTIN) is the combination of the GTIN and a Serial Number for an individual item. Serial numbers are needed for RFID and for 2D barcodes on the consumer package at Point of Sale. Using SGTIN, suppliers can retrieve information about a particular item such as batch/lot, date/place of manufacture or expiry date. Each item should only have one serial number and there are slight differences in the conventions currently used for assigning SGTIN for RFID and 2D. Suppliers must understand serial number construct when using both RFID and 2D. For in depth information, see the RVCF paper [Serial Numbers for RFID and 2D Barcodes at Point of Sale in General Merchandise Retail](#)

Appendix B – Resources

GS1 - The GS1 organization creates and maintains standards used world-wide to provide a common foundation for businesses by uniquely identifying, accurately capturing and automatically sharing vital information.

[GS1 General Specifications](#) is the GS1 document for the GS1 system, including identification keys (Global Trade Item Numbers, Global Location Numbers, etc.), specifications and the use of GS1 bar codes.

[GTIN Management Standard](#), previously known as the *GTIN Allocation Rules*, explains when an item changes sufficiently to warrant a new identification number – a new GTIN.

[Package and Product Measurement Standard](#) explains how to measure and weigh a product. Click [here to download the PDF](#).

[GS1 Global Product Classification \(GPC\)](#) provides a universal trade item classification system. This allows items to be grouped for searching, cataloging, and identifying item attributes needed for that group.

GS1 US is the GS1 member organization for the United States. They manage the assignment of company prefixes for US based brand owners. They create guidelines, certification and educational opportunities based on the GS1 standards applicable to the US.

[Apparel and General Merchandise Guide – Best Practice Guideline for Exchanging Images and Attributes](#) with “Ask Apparel” chat bot.

[GS1 US Trade Item Identification and Communication Guidelines for Electronic Data Interchange](#)

RVCF - [Whitepapers and Guidelines](#):

[EDI Basics for Retail](#)

[Serial Numbers for RFID and 2D Barcodes at Point of Sale in General Merchandise Retail](#)

[All About Retail Compliance \(and more\) - A Supplier's Guide to the Retail Supply](#)

Previous RVCF Business Process Work Groups guidelines: [Error Prevention and Notification for EDI Ship Notices and Labels](#) and [RVCF Business Process Guideline for PO Changes](#).

Appendix C – GS1 Package and Product Measurement Basics

The GS1 [Package and Product Measurement Standard](#) is the international standard for measuring and weighing a product. Click [here to download the PDF](#). The document has extensive information and over one hundred illustrations for measuring standard logistics units and consumer products, with and without packaging.

This is intended to be a short overview of the major principles. Always consult the most recent version of the measurement guideline for important details about measuring specific products.

The value in using an international standard to determine weight and dimensions is that the results are consistent and repeatable. Two people with the same item and the same instructions will get the same results.

A consumer item may be measured with and without packaging. It is important to understand the retailer's requirements for measuring an item. For instance, should the item be measured on a hanger or folded?

Audit weights and measurements periodically. Measure several examples if temperature and humidity is a factor. A prototype may have been used for the initial measurements. Always measure the product again once it is in production.

The term "depth" is used here, but "depth" and "length" are interchangeable.

Consumer Trade Items:

A consumer trade item has a Global Trade Item Number (GTIN) and is intended for Point of Sale (POS). The retailer may require measurements for the item with and/or without the consumer packaging. The unpackaged product may be referred to as the natural state. The default front is the side intended to be consumer facing. It is not necessarily the way a product may be configured in a store planogram. For instance an item may sit on a shelf in an upright position, on its side or laying on a shelf (e.g. boxes of puzzles).

Packaged and unpackaged consumer items are measured as follows:

1. Determine the default front as the side intended to be consumer facing.
 - a. If not obvious, the largest surface is the default front.
 - b. Height = measure the front, top to bottom
 - c. Width = measure left to right
 - d. Depth = measure front to back
2. Always measure the maximum distance.
 - a. If the item is in a tray, measure the widest point which may be the tray, or it may be the item in the tray.
 - b. A round item will have two dimensions that are the same. If placed "tall" the width and depth will be the same
 - c. An item such as a squeeze bottle or a frying pan will be measured at the widest point in all dimensions
3. Remember when recording the measurements, **ALWAYS ROUND UP** to the level of precision. A dimension that measures 1.1 inches is rounded up to 2 inches if the level of specificity is inches represented in a whole number.

Logistics Units – Non-Consumer Trade Items:

A Non-Consumer Trade Item is a standard trade item not intended for Point of Sale. This may be a standard pallet load, carton or inner pack. Best business practice is to assign a GTIN to identify package hierarchy and contents. It is intended for general distribution.

Determine the natural base – how you would set down the carton based on markings (words including the human readable below a barcode, arrows, the intended top for opening, etc.) If unable to determine the natural base, the largest flat side is considered the bottom for measurements. Measure as follows:

1. Height = bottom to top
2. Width = short side
3. Depth = long side
4. Measurements include any protrusions, trays, pallets, etc.
5. Remember to ROUND UP to the level of precision.

Level of precision and conversions between units of measure:

1. The supplier determines the unit of measure for their product dimensions and weight.
2. Conversions
 - a. A retailer may convert the unit of measure within a measurement system (inches / feet; pounds / ounces; millimeters / centimeters).
 - b. The level of precision is determined by the user with the following exceptions:
 - i. Millimeter is rounded up to the whole mm
 - ii. Inches are rounded up to the nearest 0.05 inches
3. Conversion **between measuring systems** is as follows:
 - a. 1 inch = 25.4 mm
 - b. 1 millimeter = 0.03937 inches
 - c. 1.0 pounds (avoirdupois) = 0.454 kilogram
 - d. 1 kilogram = 2.205 pounds (avoirdupois)
 - e. Convert first, then round UP to the level of precision

The GS1 guideline includes a table of standard tolerances.

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