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Log of Changes

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<th>Date of Change</th>
<th>Changed By</th>
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<tr>
<td>1.0</td>
<td>Jan 2023</td>
<td>S. Robba/D.Yeksigian</td>
<td>Initial release</td>
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1 Introduction

The purpose of the Guiding Principles for Attributes and Codes is to provide a reference document for attribute and code development and creation. It provides an overview of attributes and codes along with its fundamentals, principles, and rules.

1.1 Out of scope of this document (Please see Appendix for links)

- Global Product Classification (GPC) Principles
- GS1 Architecture Request for Finding (RFF) GPC vs GDSN duplication
- GS1 Validations
- GS1 Work request submissions
- Technology: GS1 Web Vocabulary, GDSN, etc.

2 Master Data Overview

GS1 Global Master Data (GMD) is a process that gives all trading partner a standard way to exchange product information in the same way globally/regionally or locally. This provides a benefit to consumers when making buying decisions based on consistent information. It ensures that product information is correct and uniform, everywhere in the world. The term “product” as used throughout this guide refers to physical and digital products and services.

The business objectives of Master Data are to provide:

- A common way to exchange the data required to list, order, ship, store and sell products.
- A common vocabulary of information to help consumers with their buying decisions.

2.1 Attributes

Attributes are defined as a changeable property or characteristic of a product or company that can be exchanged to provide a common language across various parties.

2.1.1 Attribute data types

Attributes can come in various data types. There are reasons why you would or would not use a particular data type from a business purpose. This is critical when researching if an attribute, which may already exist, will suite your purpose. This is not a complete list of attribute types. For a full list please refer to the Work Request template page [https://www.gs1.org/standards/wr](https://www.gs1.org/standards/wr): How to fill out GS1 Attribute template [Click here to download](https://www.gs1.org/standards/wr).

<table>
<thead>
<tr>
<th>Data type of attribute</th>
<th>What is it?</th>
<th>Why use it?</th>
<th>When not to use it?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description</td>
<td>A way to communicate a text of information that encompasses the language used.</td>
<td>Allows a way to send descriptive information. In addition, allows the user to send the information in various languages as some markets have multiple national languages or the community languages vary.</td>
<td>When you need exact values exchanged.</td>
</tr>
</tbody>
</table>
### Data type of attribute | What is it? | Why use it? | When not to use it?
---|---|---|---
**Code** | A way to send exact value from a drop-down list. | These are useful when specific data values are needed to improve accuracy. These can be translated, if necessary, by the user. These are particularly important to facilitate consumers’ search and discovery of products when shopping on websites. | When the data can vary for similar information. There is a limit on how many codes are useful before it becomes useless. |
**Boolean** | A way to state a data point is true/false, yes/no to a piece of information. | When there is a need for a positive or negative response. Usually for compliance with a regulation when the false/no is just as important as true/yes. | If only the positive of true/yes is needed, you may need a code, not an attribute. Be aware of exceptions as non-binary logic may fit your need. |
**NonBinaryLogicEnumeration** | A way to state true/false, yes/no to a piece of information. Additionally allows the user to state something is not applicable to a product or is unspecified. | This is particularly useful when working with regulations. When yes/no is needed, but sometimes regulations have exceptions, and this allows a user to state the attribute is not applicable. | When the only values are true/false, yes/no. |
**String** | A way to communicate a text of information when a language or translation is not needed. | For things, like product model numbers, when you have various character sets needed and translation is not needed. | Avoid using in multiple markets with different languages is required. |
**Measurement** | A way to share information that will need a measurement and the ability to state the unit of measure. | Useful for many of the types of measures that are needed for especially scientific or length measurements. | Not useful for counts of objects. |
**Integer** | To share whole numbers with no decimals. This includes negative integers also. | Useful for scores or things that can use negative and positive whole numbers. | Do not use if you only need positive numbers. |
**Non-negative Integer** | Sharing whole number information that cannot be negative integers. | This is useful for counts of things. | Do not use for decimal, measurements as it is the wrong data type. |

### 3 Master Data Fundamentals and Principles

#### 3.1 Foundational goals

- Insure there is a business need and benefit for any master data request.
  - Understand how the information will be used by the business user.
- Reduce the amount of duplication by analysing the request and understanding what the actual need is.
A requestor will need to give a business cost and impact of “why” the current standard does not work.

This is not absolute as the term duplication will be defined further.

Awareness of cost and impact to the communities. A business need and benefit should outweigh the cost or impact to the community.

### 3.2 Levels of Master Data Usability

- Concept: Levels of defining master data usability – the objective is to define how business terms are created or analysed by trading partners. Sometimes looking at a business term from a simplistic aspect without no context of meaning, to looking at something so specific, it can only be used for 1 purpose.

<table>
<thead>
<tr>
<th>Level</th>
<th>Generic Business Term</th>
<th>Business Context + Business term</th>
<th>Unique/Specific Business term</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No business context</td>
<td>Splitting the business context from the term</td>
<td>Business context included in term</td>
</tr>
</tbody>
</table>

What does this look like:

**Complexity can be seen two ways:**

- Unique term = Large number of attributes or codes = complex to find what is needed
- Generic term = no business value as the attribute has little business meaning, hence more requests for attributes/codes.
3.3 Business readability versus Machine-to-Machine capability

Due to initiatives like the GS1 Global Data Model and Attributes Definitions for Business there is a larger need to make sure attributes and codes are readable by a businessperson or are defined with “business friendly” definitions.

This allows the standards created to be technology agnostic. This means the same standard can be used in an electronic system exchange or in a spreadsheet by someone who may be visually reading it.

3.4 General Principles

Business Object – An attribute, attribute + code or a code can be defined as a business object. This means the element or combination of elements should result in unique standards.

Duplication – from a Master data perspective means that the “Business Object” is duplicative.

- An attribute or code by itself may be considered as being duplicative, but one must always evaluate the business context (attribute) used.
- This means not only the content is the same but in business, the same objective is meant, serves the same business purpose.
  - Is the information important for Consumer facing – shopping purchase?
  - Is the information important for patient safety and regulatory?
  - Even though there is overlap – what is the % something can overlap?

Example 1:

Gluten – If a term of just “Gluten” is exchanged.

- Is it an allergen?
- Is it about a type of diet?
- Is it a claim the product contains gluten or free from gluten?

Gluten needs a business context to understand the business purpose.

Therefore, a code of GLUTEN may exist in multiple attributes, pending the business context or object being defined.

Example 2:

Different Business needs

- Consumer information vs. Recycling needs - Example of when attributes seem to be duplicate but serve a different purpose.
  - Consumer information
    - Packaging Feature Code is designed for consumer facing data as the codes contain additional “features” of the packaging, which may influence a consumer’s buying decision.
      - CAP
      - CROWN_CAP
      - SCREW_CAP
      - SCREW_CAP_METAL
      - SCREW_CAP_PLASTIC
      - TWIST_OFF_CAP
  - Recycling needs
    - Packaging Material Element Code, Packaging Material Type Code and Packaging Material Composition Quantity – Create a “Business object” to specify the amount of material one of these elements are made of for recycling programs.
      - Packaging Material Element Code is simply CAP with no function of how to use the cap, not material suggestion.
Packaging Material Type Code is POLYMER_HDPE as this is a specific type of material. There is value to the consumer for this type of information. E.g., recycle programs.

Packaging Material Composition Quantity would be the weight of the Cap made of HDPE Plastic.

4 Attribute vs Codes

4.1 Introduction

This section defines the process of determining the correct type of attribute needed. Common feedback received is "there are too many attributes" or "there are too many codes to select from".

4.2 Attribute vs. Code balance

<table>
<thead>
<tr>
<th>Balance</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Generic Attributes &amp; Codes</strong></td>
<td>The business context is all in the code or value and definition.</td>
</tr>
<tr>
<td></td>
<td>This leads to hundreds of codes in one attribute. This tends to make lists too big for businessperson to find the right code.</td>
</tr>
<tr>
<td><strong>Business Attribute &amp; Code</strong></td>
<td>Allows flexibility to create proper attributes and minimize duplication.</td>
</tr>
<tr>
<td></td>
<td>A balance between codes and attributes, product category specific and product specific attributes and codes.</td>
</tr>
<tr>
<td><strong>Product Specific Attributes</strong></td>
<td>The attribute can stand on its own without any interpretation.</td>
</tr>
<tr>
<td></td>
<td>This leads to thousands of attributes. Difficult for sellers to maintain as they will have to populate and look through thousands of attributes.</td>
</tr>
</tbody>
</table>

4.2.1 Determining proper attribute

4.2.1.1 Product category specific attribute or generic attribute used across multiple product categories

- Specific/Unique attribute – when the attribute needs to be product category specific.
- Generic attribute – when the attribute is usable to go across product categories.
- Business costs to examine
  - Regulation compliance
    - Example: Failure to comply may lead to fines.
  - Poor data quality – leading to liability.
    - Examples: Incorrect allergens, Patient safety, etc.
- Versus
  - Adding an attribute to various systems
  - Adding business process to capture additional information
4.3 Steps to determining what to ask for:

**Question 1**
Does your "business requirement" already exist as an attribute?

**How to verify**

1) Get latest copy of GS1 Business Message Standard (BMS), use the Global Data Dictionary (GDD), or get copy of Attributes Definitions for Business (ADB).
2) In BMS or GDD look for a technical attribute name (XML) or a definition, which contain something similar or exact to your business requirement.
3) In the ADB, search the Business attribute names, definitions, usage statements and examples, which contain something similar or exact to your business requirement.
**Decision**

Has your requirement been found?

- **What is next?**
  1. A work request may be needed.
  2. Possibly the definition needs to be slightly modified/updated.
  3. An additional code may be needed.
  4. The product category is incorrect or placement in standard.
  5. Or something technical like incorrect data type, attribute needs to repeat, etc.

A work request is suggested. If a code is needed go to next step.

---

**Question 2**

Does your “business requirement” already exist as a code or you need a new code?

**How to verify**

2. In Code list or GDD look search for your business requirement in the Code values, Code names and Code definitions.
3. Review the attribute that the code is applicable to.

**What is next?**

1. A work request may be needed.
2. Possibly the definition of a code needs to be slightly updated.
3. An additional code may be needed.
4. Similar code exists, but product category is incorrect or placement in standard.

A work request is suggested.

---

**Submit a work request:**

Determine what data type is needed for your request. See section 2.1

1. Review data types.
2. Why use certain data types?
3. When not to use a data type?
4. Review the rest of chapter.
4.4 Changes to current standards

- If an attribute/code exists but definition is not clear or needs expansion to meet the business need.
  - Solution: Expand the definition. Example: Vegan food/nonfood originally the definitions for claims concerning Vegan only referred to food, a simple work to include in the definition was state non-food product were also applicable.
- An attribute exists, but the data type does not meet the business need.
  - Examples:
    - Search & discovery on a website for drop down or a description data type.
    - A drop-down list for a website cannot be created from a description. A buyer would have to read each description to determine which drop down selection the product may go into.
    - Therefore, the business need is different, and the current standard does not support the business usage, therefore duplication is acceptable when the business need is clear and the benefit exists.

4.5 Requesting Boolean attributes

- Should only be requested, if a negative answer is required by regulation or has a specific business benefit.
  - Example: Filtered vs Unfiltered, when multiple filters exist, no need for positive isFiltered as an attribute “filter Type Code” would be useful.
  - Example: Has Automatic Transmission as the negative would be a manual transmission which consumers search for. This has a benefit to consumers.
- If this a feature of product and the seller would never claim something does not have a feature, then a negative claim is usually not a marketing claim to sell something.
  - If only the positive is needed this should be a code somewhere.
  - Example: Waterproof. A seller would not claim a product is not waterproof.

4.6 Specific product category or generic attribute for codes

4.6.1 Specific product category

One of the challenges with code attributes is determining should an attribute be generic or a specific product category attribute.

- Step 1: Is the list of codes “unique” for a "Product Category".
  - Unique would be that 70-80% of the codes are unique for a "Product Category".
  - Product Category would be the appropriate level in the GPC Hierarchy (Segment>Family>Class>Brick) that “Uniqueness” can be found.
- Examples:
  1) Size types for Medical Devices were found to be unique to the GPC Segment of Medical devices, therefore a new attribute was determined to be applicable. In addition, fines due to incorrect selection of a proper clinical size reported to a regulatory body.
  2) Seafood separated from Meat/Poultry. Seafood presentation codes were unique at the GPC Family, therefore a separate attribute was created.
- Step 2: Sometimes the “product category uniqueness” process does not work, and a Logical “Uniqueness” must be created. A business determination must be made of where “uniqueness” occurs.
• **Example:**
  1) Meat vs. Poultry type of cuts – When looking at GPC Segment – Food/Beverage/Tobacco – Unique
     Family - Meat/Poultry/Other Animals – Unique
     Class – The type of cuts spans across two classes
     □ Meat/Poultry/Other Animals – Prepared/Processed
     □ Meat/Poultry/Other Animals – Unprepared/Unprocessed

     Therefore, a business decision can be made there is a need to split Meat and Poultry cuts as the animal belong to a type of group and their cuts were unique for each type of group (Meat group and Poultry group)

• **Step 3:** *If at the GPC Segment level the value can span across multiple segments then a generic attribute is best.*

   In this instance we can leverage the code value context mapping.

4.6.2 **Generic attributes for codes**

The development of how to manage large code lists for generic attributes utilizes the Code Value mapping to Master Data Context.

4.6.3 **What is Master Data Context?**

During GDSN Major Release an idea was generated to map GPC Bricks to product categories groups called “Contexts” that have like product characteristics. The “groupings” were defined as:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DP001</td>
<td>Audio Visual Photography, Electronics, Communications, Computing and Appliance Products</td>
</tr>
<tr>
<td>DP002</td>
<td>Audio Visual Media Products</td>
</tr>
<tr>
<td>DP003</td>
<td>Beauty Hygiene Home Healthcare Products</td>
</tr>
<tr>
<td>DP004</td>
<td>Cleaning Hygiene Products, Lubricants, Fuels, Automotive and Building Product Chemicals</td>
</tr>
<tr>
<td>DP005</td>
<td>Clothing And Personal Accessories</td>
</tr>
<tr>
<td>DP006</td>
<td>Food Beverage Tobacco and Pet Food Products</td>
</tr>
<tr>
<td>DP007</td>
<td>Medical Devices</td>
</tr>
<tr>
<td>DP008</td>
<td>Pharmaceutical</td>
</tr>
<tr>
<td>DP009</td>
<td>Sporting Goods</td>
</tr>
<tr>
<td>DP010</td>
<td>Building Products, Automotive, Tools, Office and Aris Supply Products</td>
</tr>
<tr>
<td>DP011</td>
<td>Household/Office Furniture/Furnishings</td>
</tr>
<tr>
<td>DP012</td>
<td>Kitchen Merchandise</td>
</tr>
<tr>
<td>DP013</td>
<td>Live Animals and Live Lawn/Garden Plants</td>
</tr>
<tr>
<td>DP014</td>
<td>Toys, Games, Musical Instruments</td>
</tr>
<tr>
<td>DP015</td>
<td>Cross Segment and Variety Packs</td>
</tr>
</tbody>
</table>

**Note:** DPI or DP is defined as Distribute Product Information. You may see both in GS1 documentation.

The GPC Brick mapping to Context can be found here: [GDSN Release page](#)  
The file is named under Release Guidance: GPC to Context Mapping
4.6.3.1 Generic attribute codes mapped to context

The way to alleviate the issue of too many codes in a generic attribute that may cross several contexts is to provide which contexts a code is applicable. This then can reduce the number applicable codes to a product when selecting.

- Example:
  - AC_DC_ADAPTER would be applicable to Electronics, Toys, etc. but most likely not applicable to Food, Live animals, etc.
  - Based upon the GPC Brick selected a system or review of the code mapping can reduce a list of applicable codes by 20-70%. This is important as it reduced the potential for error in selecting a bad code.

4.6.3.2 Generic attribute codes mapped to context example

In the mapping the codes values are assigned a rating on applicability

1 = Most likely used
2 = On occasion used (used infrequently) ~5%
3 = Very rare occasions or not applicable >1%

<table>
<thead>
<tr>
<th>Code Value</th>
<th>Code Name</th>
<th>Definition</th>
<th>Electronics</th>
<th>Food</th>
<th>Live animals</th>
<th>Ladies</th>
<th>Gents</th>
<th>Toys</th>
<th>Sporting Goods</th>
<th>Office</th>
<th>Homeware</th>
<th>Retail</th>
<th>General</th>
<th>Automotive</th>
<th>Chemicals</th>
<th>Cosmetics</th>
<th>Datacom</th>
<th>Industrial</th>
<th>Medical</th>
<th>NonFood</th>
<th>Promo</th>
<th>Pets</th>
<th>Power</th>
<th>Pub</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC_DC_ADAPTER</td>
<td>AC/DC adapter</td>
<td>A power supply that is built into a plug and is not built into the unit for powering</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ADDITIONAL_ATTACHMENTS</td>
<td>Additional attachments</td>
<td>Indicates whether a product comes with separate accessories for example a shower head sold with a shower head.</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>3</td>
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<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
<tr>
<td>ADJUSTABLE</td>
<td>Adjustable</td>
<td>Code indicating the ability, or lack of ability, to change to conform to a intended shape, form, size or style.</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td>3</td>
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<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

5  Rules & Guides for leveraging GPC Brick attributes

This is a guide when trying to leverage GPC Brick attributes as master data attributes potentially to support business to consumer information.

Steps on what should be done:

1. Review the content outlined above.
2. Analysis should be done prior to submission; community resources are limited.
   - If analysis is not done and request is just repeating GPC Brick attributes, the work request will be sent back as not actionable.
3. It is the responsibility of the submitter to try their best to work through the process before submitting a work request.
4. Since GPC brick attributes are applicable to product, is there a common attribute name or part of a name that spans across product categories? (See section 4.5 or guidance).
   - How many categories can the values go across?
   - What level of GPC hierarchy does it fit?
   - If many GPC Segments are applicable, then a generic attribute utilizing the Context mapping is recommended.
5. Are there terms in the brick attribute values that are similar?
   - Example: Can another attribute be created that can reduce number of codes?
   - numberOfRibs – for meats there was over four hundred codes with the term "Ribs" and a number of ribs for the product. By adding one attribute numberOfRibs, this reduced the number of codes needed.
6. Creating possible Boolean where makes sense, see section 4.4 Booleans
   - Example:
     - In meats Boneless vs Boned makes a difference to consumers.
     - But does isBoneless make sense or do codes BONELESS and BONE_IN provide more formation and no incorrect interpretation.

7. Examine the list of attribute code values.
   - GPC historical values may need to be updated.
   - Some brick attribute values were placed incorrectly in the wrong attribute. A work request may be needed to update GPC.
A Appendix

- Global Product Classification (GPC) Principles
- GS1 Architecture Request for Finding (RFF) GPC vs GDSN duplication
- GS1 Validations
- GS1 Work request submissions
- Technology: GS1 Web Vocabulary, GDSN, etc.