GUIDELINES ON USING SDMX ANNOTATIONS

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Introduction

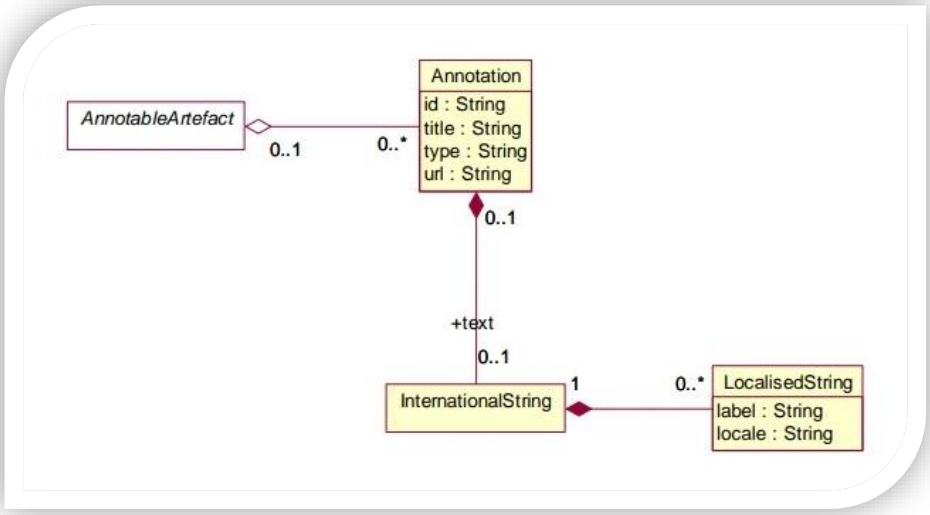
According to the SDMX documentation the Annotation is a construct that contains user or organisation-specific metadata. The Annotation construct in SDMX is available to most of the SDMX structural metadata artefacts. This facility is essentially a flexible extension mechanism allowing metadata to be added to an SDMX structural artefact. Note that whilst the SDMX Annotation has a specific structure (Title, Type, URL, Text) individual organisations are free to use these in any way and any combination they wish. However, an Annotation can only be processed in a meaningful way (i.e. other than viewing it) by systems that understand its semantics.

The main advantage of the Annotation is its flexibility as all properties can be tailor-made and there is no limit to their number. This can prove very useful for specific applications, such as dissemination tools. The main drawback is poor interoperability as Annotations convey no semantics and are not standardised. This means that organisations that want to exchange Annotations and process them automatically must agree upon, at least, a common naming syntax.

The aim of this guideline is to improve machine interactions by proposing a controlled vocabulary for the Type property of the SDMX Annotation construct and a recommended usage for the other properties that will greatly improve the interoperability of Annotations between SDMX-compliant organisations.

The Controlled Vocabulary referred to above will be maintained as a SDMX Concept Scheme stored in the SDMX Global Repository.

SDMX Information Model for the Annotation construct (SDMX 2.1)



All classes derived from the abstract class AnnotableArtefact may have Annotations. The Annotation is used to convey extra information to describe SDMX constructs. This information may be in the form of a URL reference, a non-localised text, and/or multiple localised texts (represented by the one-to-many relationship to LocalisedString).

Properties of the Annotation construct

The properties of the Annotation construct are listed below. This information is taken from the SDMX official technical documentation.

id	Identifier for the Annotation. It can be used to disambiguate one Annotation from another where there are several Annotations for the same annotated object. (Source 1[1])
title	A title used to identify an Annotation.
type	Specifies how the Annotation is to be processed. (Source 1) The **type** is often used as the usage context of the Annotation. The types are not enumerated[2], as these can be specified by the Annotation creator. The definitions and use of Annotation types should be documented by their creator. (Source 2)
url	A link to external descriptive text. (Source 1) The **url** is a URI - typically a URL - which points to a resource. If a specific behaviour is desired, an Annotation type should be defined which specifies the use of this field more exactly. (Source 2)
+text	An International String provides the multilingual text content of the Annotation via this role. (Source 1). **Text** holds a language-specific string containing the text of the Annotation. (Source 2)

This guideline adds more context to and sometimes overrides these property descriptions. For instance:

- In this guideline, the **id** property is used to identify that the annotation is part of this controlled vocabulary and follows the described principles, instead of being used to disambiguate as describe in the above table;
- In this guideline, the **type** property for the **id**=@SDMX annotations is enumerated in the included controlled vocabulary

Introducing Standard Annotations

As stated earlier, a major drawback of the Annotation construct is the fact that they are not standardised for reuse when exchanging structural metadata. Annotations are containers for additional information relating to the object to which they are attached. This means that for an Annotation to be interpreted in the same way by exchange partners, a reference is needed that defines some standard behaviour and implementation.

This guideline proposes an Annotation controlled vocabulary and guidelines on their (re)use for SDMX implementers.

[1] SDMX Standards, "Information Model: UML Conceptual Design", version 2.1

[2] The technical standard does not enumerate the annotation types, however this guideline provides a recommended enumeration or controlled vocabulary

A standard Annotation can be defined as an Annotation that has an agreed definition and behaviour in the SDMX community. Many standard Annotations are structured in a normative way so that diverse systems can parse the information and perform a specific action in response[3].

How to Identify Standard Annotations?

In order to be able to configure their applications to implement actions upon standard Annotations, consumers must know how to identify such Annotations. This is done by setting the Annotation **id** property to "@SDMX" which links the Annotation to the controlled vocabulary described in the section List of Standard Annotations. Setting **id** to "@SDMX" avoids reserving keywords for other usage contexts. For example, ORDER could be the order of codes (as described in this controlled vocabulary) or some kind of order number (a different usage).

The additional mandatory information to be provided is the **type** property that specifies the type of action to be implemented. There may be other mandatory property values depending on the type of the standard Annotation.

Examples

The green columns in the table below show example usages of standard Annotations. The orange "ORDER" column is not a standard Annotation because the usage context is not the same as the standard Annotation "ORDER", therefore the **id** should not be "@SDMX".

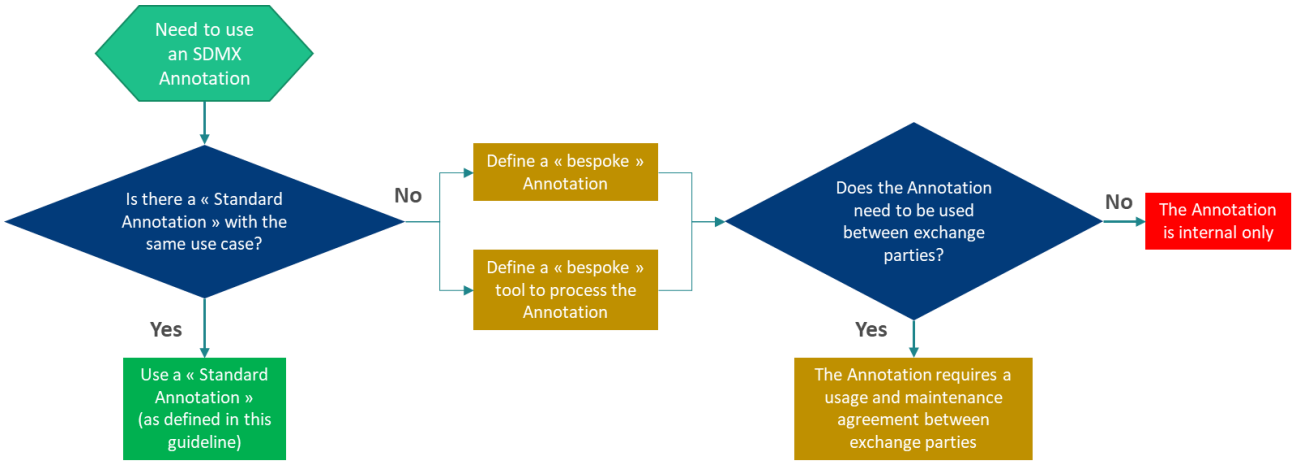
id*	**@SDMX**	**@SDMX**	**@SDMX**	**Not @SDMX** This is a "customer order no." which is a different use case than the ORDER standard Annotation which is a list order
title				1934245
type*	NOT_DISPLAYED	EXCLUDES	ORDER	ORDER
url				
+text			en :10	
			fr :20	

* denotes a mandatory information for standard Annotations

[3] DDI (https://ddialliance.org/taxonomy/term/198)

The Business value of Standard Annotations

The following diagram explains the business value and decision process when deciding whether to use a standard Annotation. As can be seen, if they are used then a maximum reuse is made of the Annotation itself, tools and processes. If they are not used then bespoke Annotations, agreements, tools and processing are required to understand and make use of the information in the Annotation, and it (plus supporting tools, processes, etc.) is harder to reuse.



List of Standard Annotations

This section lists the standard Annotations with their typical usage contexts. This list is not finite and will be expanded over time as new implementations and needs arise. When references to external standards are made (e.g. skos or xkos specifications), the reader is invited to consult the “References” section for more information.

The list of standard Annotations is available from the SDMX Registry as artefact: SDMX:CS_ANNOT(*.*.*). Link: https://registry.sdmx.org/ws/public/sdmxapi/rest/conceptscheme/SDMX/CS_ANNOT/latest/?format=sdmx-2.1&detail=full&references=none

Note: There are several Annotations that are types of name or label, e.g. FULL_NAME, SHORT_LABEL, ORIGINAL_LABEL. These Annotations have specific use cases that are described in the tables below and should not be used to replace an artefact’s or item scheme item’s Name and Description property.

Relationships between Annotation properties

Text value defaults and specific locale values

Some use cases may benefit from having a single, default value for all locales/languages but also to set the value for certain locales. An example is ORDER where there may be a default list order for all locales but two locales have a specific order which is different from the default. In order to avoid having to state an order for every locale, the Annotation Title property may be used to state the default value, whereas the text property is used for the localised values. When both an Annotation Title and Annotation Text property for the locale exists, the Annotation Text property overrides (is used instead of) the Annotation Title property.

Consider this annotation example: An ORDER annotation type that is attached to a code item ACME. If both the Annotation Text and Annotation Title have values, then the Annotation Text value (e.g. en:10,es:20) is used for the localized values instead of the Annotation Title (e.g. 30) which would only be taken if the locale in the context is not found among the specified ones.

URL value defaults and specific locale values

When linking to other resources, the URL property allows a single value for the Annotation. There may be cases where different URLs are required for certain locales. In this case, it is recommended to use the Annotation text property and state the language and URL in an HTML fragment, for example:

```
fr:<a href="https://someLink">
```

When both a URL and text property for the locale exists, the text property overrides (is used instead of) the URL property.

General and Display-related Annotation types

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
FULL_NAME	Alternative name to be displayed for items in Item Schemes (e.g. Codelists, Concept Schemes, Category Schemes) whenever the item is displayed without its parent. For example, if a code list that has a hierarchy is displayed as a flat list, then this annotation may be used to provide sufficient context for the code	Item in an Item Scheme	<language>:<content>, <language>:<content>,… *Example:* en:Labour force (Employment)		
REPLACE_NAME	Replace each code name in a component by the value of another component in an observation or series	A Dataflow or DSD		<component to replace code>:<component to use code> *Example:* CUST_BREAKDOWN:CUST_BREAKDOWN_LB	
REPLACE_CONTENT	Replace the content in a component by the value of another component in an observation or series	A Dataflow or DSD		<component to replace content>:<component to use content> *Example:* REF_AREA:M49_CODE	
COMPLEMENT	Additional information to be displayed in parenthesis after the code name	Item in an Item Scheme	<language>:<content>, <language>:<content>,… *Example:* en:See reference metadata		
ORDER	Explicit indication of a localised order of items in Items Schemes or artefacts (e.g. Codelist, Concept Scheme, Category Scheme, Dataflow, etc.)	Either: • an artefact, or; • an item in an Item Scheme	*This is optional* <language>:<content>, <language>:<content>,… *Example:* en:10,es:20	*This is optional* <content>	

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
TOTAL	Code Item that represents a total value. If the attachment is: • to a Code, the Annotation Text is optional and may contain an explanatory text; • to a Codelist, the Annotation Title is mandatory and includes the code(s) that represent a total	Either: • a Code Item that represents a total value, or; • a Codelist to specify the code(s) with the total	*This is optional* <language>:<explanatory text>, <language>:<explanatory text>,…	Attached to Code Item: <blank> Attached to Codelist: <code>,<code>,…	
DRILLDOWN	Denotes the concept that specifies whether observations are at the aggregate level or a drilldown.	Either: • A Dataflow or DSD, or; • a Concept in a Concept scheme		<concept Id> *Example:* DD_DIM (this concept should be hidden using the NOT_DISPLAYED Annotation below)	
DEPRECATED	Indication that an Item in an Item Scheme is deprecated	Item in an Item Scheme	*This is optional* <language>:<content>, <language>:<content>,… *Example:* en:deprecated,fr:obsolète		
DEFAULT	Indication that an Item in an Item Scheme or artefacts is to be selected by default. The Annotation defines a selection so that a pre-defined default subset of data can be processed (e.g. visualised, extracted) instead of the entire dataset	- Item in ItemScheme - DSD or - Dataflow Note: A DEFAULT Annotation attached to a later level in this list supersedes that attached to an earlier level. E.g., a DEFAULT Annotation attached to individual Codes in Codelists is only to be used when there is no DEFAULT Annotation attached to the Dataflow nor to the DSD, and those of DSDs are only to be used when there is no DEFAULT Annotation attached to the Dataflow.		Attached to: - Item in Item scheme: ***<no content>*** - DSD or Dataflow: **<concept>=<code>+<code>+…,<concept>=<code>+<code>+…** *Example*: FREQ=A+Q,TIME_PERIOD_START=2013-01,TIME_PERIOD_END=2018-12	
Annotation Type	**Use Case**	**Where to attach**	**Annotation Text**	**Annotation Title**	**Annotation URL**

IMAGE	A visual identity to associate to Item Scheme Items or artefacts	Either: • an artefact, or; • an item in an item scheme	*This is optional, used if localised URLs are required* <language>:<HTML containing URL to the resource>, <language>:<HTML containing URL to the resource>,… *Example:* en:<a href="https://sdmx.org/wp-content/uploads/SDMX_guidelines_page_word_cloud.png">		<URL> *Example:* https://sdmx.org/wp-content/uploads/SDMX_guidelines_page_word_cloud.png
DRILLDOWN_CONCEPTS	Concepts to be displayed in a drilldown operation	Dataflow or DSD		<concept Id>,<concept Id>,… *Example :* DONOR,RECIPIENT,YEAR,PROJECT_ID,OBS_VALUE,DESCRIPTION,OWNER	
NOT_DISPLAYED	Used to hide components or their values in the presentation	Either: • a Dataflow or DSD, or; • an Item in an Item Scheme		Attached to Item in Item Scheme: <blank> Attached to Dataflow or DSD: <concept Id>,<concept Id>,… *Example :* DD_DIM (to hide drilldown control concept)	
LAYOUT_ROW	Dimensions to be presented in rows (concepts on y-axis)	Either: • an artefact, or; • a Dimension		Attached to Dimension: <blank> Attached to Dataflow or DSD: <dimension Id>,<dimension Id >,… *Example:* REF_AREA,MEASURE	
LAYOUT_COLUMN	Dimensions to be presented in columns (concepts on x-axis)	Either: • an artefact, or; • a Dimension		Attached to Dimension: <blank> Attached to Dataflow or DSD: <dimension Id>,<dimension Id>,… *Example:* TIME_PERIOD	

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
LAYOUT_ROW_SECTION	Dimensions to be presented at the section level	Either: • an artefact, or; • a Dimension		Attached to Dimension: <blank> Attached to Dataflow or DSD: <dimension Id>,<dimension Id>,… *Example:* SEX	
EXT_RESOURCE	A localised link to an external resource associated to the annotated artefact. For example, an ontology item	Any SDMX object	*This is optional* <language>:<HTML containing URL to the resource>, <language>:<HTML containing URL to the resource>,… *Example:* en:<a href="http://rdf-vocabulary.ddialliance.org/xkos#depth">		<URL> *Example:* http://rdf-vocabulary.ddialliance.org/xkos#depth

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
UNIT_MEASURE_CONCEPTS	Comma-separated list of concept IDs that is used to define the full unit of measure. The concepts must be in the DSD. The listed concepts' item contents may be concatenated to generate the unit of measure label (unless the UNIT_MEASURE_LABEL annotation is present).	Dataflow or DSD		<concept Id>,<concept Id>,… *Example*: UNIT_MEASURE,UNIT_MULT,TRANSFORMATION [*could generate a value of Australian Dollar, Thousands, Non-transformed*]	
UNIT_MEASURE_LABEL	Indicates the concept that enumerates the full unit of measure labels. The concept must be in the DSD. UNIT_MEASURE_LABEL overrides the UNIT_MEASURE_CONCEPTS if both are provided.	Dataflow or DSD	*This is optional, used if a freetext label is required.* <language>:<content>, <language>:<content>,… *Example*: en:USD, thousands fr:USD, milliers	*This is optional, used if an enumerated list is required.* <concept Id> *Example:* UOM_ATTRIBUTE [*This concept may contain the following items as units of measure:* • *National Currency, thousands* • *USD, thousands* • *Index, based on National Currency*]	

Codelist and Statistical Classification-specific Annotations

The categories below are taken from the document "Formalization of the Structure and Content of Statistical Classifications", adopted by the European Statistical System (ESS) Working Group on Standards in October 2019. However these categories are also used widely outside the ESS (e.g. by the United Nations Statistics Division for its central framework classifications ISIC[4] and CPC[5]).

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
ORIGINAL_CODE	Code as displayed in other representations, such as official or original documentation (i.e. possibly containing dots, spaces, etc.)	Item in an Item Scheme		<original code> *Examples:* • 0105.13 [Harmonized System] • 11.2.0.9 [COICOP classification]	
HIER_CONTEXT	Reference between a usage context and a hierarchy (that may be contained in a Hierarchical Codelist (HCL))	DSD or Dataflow		<component Id>:<HCL Id>.<hierarchy Id> *Example:* REF_AREA:OECD.EDU:HCL_REF_AREA(1.0).REF_AREA provides the link to the reference area hierarchy for OECD education data	
HIER_LEVEL	Explicit specification of the hierarchical level of a code item Reference to external standard: xkos:ClassificationLevel - property: xkos:xdepth	Code item		<hierarchical level> *Example:* 1	
SHORT_LABEL	A short label, typically for dissemination purposes where long labels are sometimes not appropriate for presentation in tables where space is an important parameter (generally less than 40 or 50 characters)	Artefact, or Concept, or Item in an Item Scheme	<language>:<content>, <language>:<content>,…	*Example:* [*Official French label "Transformation et conservation de la viande de boucherie" is shortened to*] fr:Transf. & conserv. viande de boucherie In Codelist=IMF:CL_AREA(1.13) Code 4J837 European Union Intellectual Property Office has a Short_Label EN:EUIPO	

[4] International Standard Industrial Classification of All Economic Activities
[5] Central Product Classification

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
EXPLAN_LABEL	An explanatory text that specifies “other” and similar categories. An example is the Combined Nomenclature classification where the many codes labelled “other” are complemented by a verbose text describing in detail the content of the code item	Item in an Item Scheme	<language>:<content>, <language>:<content>,…	*Example:* [*EU Combined Nomenclature official label for code 3824 99 57 reads “Other”, which is not very informative for the user; instead the EXPLAN_LABEL reads*] en:Cartridges and refills, filled, for electronic cigarettes, and preparations for use in the cartridges and refills, not containing nicotine or its salts, ethers, esters or other derivatives thereof	
EXPLAN_CONSOL	Explanatory notes. An explanatory text to be used when objects included in and excluded from a classification position are consolidated, i.e. are presented together	Item in an Item Scheme	<language>:<content>, <language>:<content>,…	*Example (from the US NAICS classification):* en:Industries in the Food Manufacturing subsector transform livestock and agricultural products into products for intermediate or final consumption. […] The food products manufactured in these establishments are typically sold to wholesalers or retailers for distribution to consumers, but establishments primarily engaged in retailing bakery and candy products made on the premises not for immediate consumption are included. Establishments primarily engaged in manufacturing beverages are classified in Subsector 312, Beverage and Tobacco Product Manufacturing.	

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
EXPLAN_INCLUDES	Explanatory notes. Description of those things known specifically to be included in the concept. Synonyms Typical labels for such explanatory notes: "This class includes", "This category includes", "This position includes", "Includes", etc. Reference to external standard: xkos:coreContentNote	Item in an Item Scheme	<language>:<content>, <language>:<content>,…	*Example (from ISIC Rev. 4 explanatory notes to code 2520 - Manufacture of weapons and ammunition):* en: This class includes: - manufacture of heavy weapons (artillery, mobile guns, rocket launchers, torpedo tubes, heavy machine guns) - manufacture of small arms (revolvers, shotguns, light machine guns) - manufacture of air or gas guns and pistols - manufacture of war ammunition	
EXPLAN_CASELAW	Explanatory notes. Indication that a decision on the classification has been made by the *ad hoc* Committee (concept generally described as “ruling”, “classification opinion”, classification decision; caselaw). Reference to external standard: xkos:caseLaw. The difference between caselaws and traditional explanatory notes is that caselaws are adopted during the time period between two official versions of a specific classification and have thus a slightly different status (e.g. from a legal viewpoint)	Item in an Item Scheme	<language>:<content>, <language>:<content>,… *Example (from NACE Rev. 2 caselaw to code 01.62):* en:Automated egg hatching for poultry - Operation of livestock management systems]		
EXPLAN_INCLUDES_ALSO	Explanatory notes. Description of those things which can be considered as borderline cases and are generally based on consensus rather than strict methodological principles (e.g. classifying wooden shoes as handicraft rather than shoes). Typical labels for such explanatory notes: "This class includes also", "This category includes also", "This position includes also ", "Includes also", etc. Reference to external standard: xkos:additionalContentNote	Item in an Item Scheme	<language>:<content>, <language>:<content>,…	*Example (from ISIC Rev. 4 explanatory notes to code 2520 - Manufacture of weapons and ammunition):* en:This class also includes: - manufacture of hunting, sporting or protective firearms and ammunition - manufacture of explosive devices such as bombs, mines and torpedoes	

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
EXPLAN_EXCLUDES	Explanatory notes. Description of those things which are explicitly excluded from a category. Typical labels for such explanatory notes: "This class excludes", "This category excludes", "This position excludes", "Excludes", etc. Reference to external standards: xkos:exclusionNote	Item in an Item Scheme	<language>:<content>, <language>:<content>,…	*Example (from ISIC Rev. 4 explanatory notes to code 2520 - Manufacture of weapons and ammunition):* en:This class excludes: - manufacture of percussion caps, detonators or signalling flares, see 2029 - manufacture of cutlasses, swords, bayonets etc., see 2593	
MAP_REFER	A reference to a classification mapping or transformation, e.g. an SDMX Structure Map	Codelist, Concept Scheme, or another Item Scheme		*This is optional.* Id of an ItemSchemeMap within the Structure Set returned by the Annotation URL	<URL>
COMP_RULE	Code item composition rule. For example, for code A the composition rule may be “A1+A2” where A1 and A2 are other codes in the same Codelist	An Item in an Item Scheme		<content> *Example:* A1+A2	
FOLLOWS	A reference used to express the succession in time of Item Schemes. For example, NACE Rev. 2 is the successor of NACE Rev. 1.1 Reference to external standard: skos:ConceptScheme - property: xkos:follows	Codelist or Item Scheme			<URL> *Example:* (CL_REGIONAL 3.1.1 follows CL_REGIONAL 3.1): https://registry.sdmx.org/ws/public/sdmxapi/rest/codelist/ESTAT/CL_REGIONAL/3.1
HAS_VARIANT	A reference used to express the relation between an Item Scheme and its variant(s). Reference to external standard: skos:ConceptScheme - property: xkos:variant For example: CL_AREA has a variant CL_GEO	Codelist or Item Scheme			<URL>

Annotation Type	Use Case	Where to attach	Annotation Text	Annotation Title	Annotation URL
SUPERSEED	A reference to a previous version, if the current version obsoleted the previous one. Reference to external standard: skos:ConceptScheme - property: xkos:supersedes	Codelist or Item Scheme			<URL>
FAMILY_LABEL	Label of the Classification Family (e.g. NACE, ISIC) Reference to external standard: skos:ConceptScheme - property: xkos:belongsTo	Codelist or Item Scheme	<language>:<content>, <language>:<content>,… *Example:* en:NACE		<URL>
COVERAGE_LABEL	Label(s) of the item scheme's coverage (e.g. National Accounts, Products, Activities, Occupations) Reference to external standard: skos:ConceptScheme - property: xkos:covers *Examples:* URL <http://eurovoc.europa.eu/56> (National accounts) URL <http://publications.europa.eu/resource/authority/data-theme/REGI> (Regions and Cities)	Codelist or Item Scheme	<language>:<content>, <language>:<content>,… *Example:* En:national accounts		<URL>

Concept Scheme SDMX:CS_ANNOT

The Concept Scheme for standard Annotations will have the Maintenance Agency SDMX and will describe the following properties for each Annotation. For the information represented by Annotations, the value is in AnnotationTitle apart from the URL property where it is in AnnotationURL.

Property	Representation in Concept	Description
Code	Concept Id	The Annotation Type column, e.g. NOT_DISPLAYED, EXCLUDES
Name	Concept Name	Short description of the standard Annotation derived from the "Use case" column
Representation	Concept Core Representation	Allowable type or format for the Annotation
Description	Concept Description	The information in the "Use case" column. Possible to add more contextual information. Specific details can be described here, such as if the value should be in AnnotationText or AnnotationTitle
Artefact(s)	Annotation Type: Artefact(s)	The information in the "Where to attach" column
URL	Annotation Type: URL	The Annotation URL column. The value is in URL

Example of a Concept

Concept Id	NOT_DISPLAYED
Concept Name	Used to hide components or their values in the presentation
Concept Core Representation	`/TextFormat@textType="String"`
Concept Description	To hide dimensions and attributes in a display (e.g. a table). For example, if they have only one allowed, available or selected value
Concept: Annotation: Type: Artefact(s)	Either a Dataflow or DSD, or an item in an item scheme
Concept: Annotation : Type: URL	

SDMX-ML of the Example

```
<str:Concept id="NOT_DISPLAYED">
   <com:Annotations>
      <com:Annotation>
         <com:AnnotationTitle>Either a Dataflow or DSD, or an item in an item
```

```
scheme</com:AnnotationTitle>
         <com:AnnotationType>Artefact(s)</com:AnnotationType>
      </com:Annotation>
   </com:Annotations>
   <com:Name xml:lang="en">Used to hide components or their values in the
presentation</com:Name>
   <com:Description xml:lang="en">To hide dimensions and attributes in a display
(e.g. a table). For example, if they have only one allowed, available or selected
value</com:Description>
   <str:CoreRepresentation>
      <str:TextFormat textType="String"/>
   </str:CoreRepresentation>
</str:Concept>
```

References

- Formalization of the Structure and Content of Statistical Classifications
- SDMX Global Registry
- SDMX Glossary 2.1
- SDMX Standards, "Information Model: UML Conceptual Design", version 2.1
- SKOS Specification
- XKOS Specification