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# OGC GEOSPATIAL USER FEEDBACK STANDARD: CONCEPTUAL MODEL. V.2.0

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**STANDARD**  
Conceptual model

**APPROVED**

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## ABSTRACT

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This OGC Geospatial User Feedback Conceptual Model. v.2.0 Standard defines an enhanced version of the Geospatial User Feedback (GUF) model (Version 1.0 of the model can be found in OGC 15-097r1 [7]). Geospatial User Feedback (GUF) is metadata that is predominantly produced by the consumers of geospatial data products as they use and gain experience with those products. GUF v.2.0 extends the original conceptual model mainly by including the description of reproducible usage of a resource.

This OGC Standard complements existing metadata conventions whereby documents recording dataset characteristics and production workflows are generated by the creator, publisher, or curator of a data product. As a part of metadata, the GUF data model reuses some elements of ISO 19115-1:2014 (the updated version of the OGC Abstract Specification topic 11) but not the general structure. This selective use of ISO metadata elements prioritizes future interoperability with ISO metadata models that may be done in future revisions of ISO 19115-1.

This standard is designed to be used in combination with an encoding standard. An XML encoding for version 2.0 of the conceptual model that is conformant with the ISO19139 encoding rules is specified as a separate OGC Standard (OGC 23-061, OGC Geospatial User Feedback Standard: XML Encoding Extension. v.2.0 [8]). In the near future a JSON encoding will also be developed.

The first version of this conceptual model (OGC 15-097r1) was based on work done in two European Union 7th Framework program projects called GeoViQua (FP7/2007-2013 under grant agreement n°265178) and CHARMe (FP7/2007-2013 under grant agreement n°312641).

During the H2020 NextGEOSS project (grant agreement No 730329), an implementation for Geospatial User Feedback (GUF) v.1.0 was created. During this implementation several improvements on the conceptual model were identified, mainly to avoid possible inconsistencies when documenting feedback items of a certain resource. Moreover, an extension of the GUF conceptual model to store reproducible usage (as a way of capturing knowledge) was defined in H2020 NextGEOSS project and refined in the H2020 EIFFEL project (grant agreement No 101003518). The result of these efforts are the main elements included or modified in this version 2.0 of the GUF conceptual model, which is being developed also related to the H2020 ILIAD project (grant agreement No 101037643).



## KEYWORDS

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The following are keywords to be used by search engines and document catalogues.

ogcdoc, OGC document, API, openapi, html



## PREFACE

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## SECURITY CONSIDERATIONS

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No security considerations have been made for this document.



## SUBMITTING ORGANIZATIONS

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The following organizations submitted this Document to the Open Geospatial Consortium (OGC):

- UAB-CREAF



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1

# SCOPE

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# 1

## SCOPE

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This OGC Standard defines a data model for encoding user feedback about geospatial datasets or metadata records describing datasets. This version of the GUF Standard reuses and extends version 1.0 of the GUF conceptual model (OGC 15-097r1) as well as the ISO 19115-1:2024 data model. A set of information classes is defined.

This OGC Standard is applicable to metadata catalogue servers and clients that want to exchange geospatial user feedback information.

This OGC Standard is defined to support implementation of catalogue clients that are able to complement the discovery of geospatial datasets. Catalogue clients present query results, commonly based on summaries of detailed metadata records created and maintained by the producers. Implementation of this Standard enable clients to present user feedback summaries and detailed user feedback reports. Clients implementing this Standard can provide a user interface to capture use input and comments for datasets or to complement the producer metadata by presenting user feedback information about the data or its metadata.

Geospatial User Feedback as used in this Standard encompasses: User comments, questions and answers, user reports of dataset problems and proposed solutions to those problems, ratings, usage reports, reproducible usage reports, citations of related datasets or publications describing usage, quality reports, relevant additional provenance information, and significant events related to the use or interpretation of a dataset.

This Standard neither defines an encoding nor a query language to request or send user feedback to catalogues.

2

# CONFORMANCE

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This Standard defines four requirements classes and four related conformance classes.

Requirements for standardization targets are considered.

- Requirements Class Quality-Common [<http://www.opengis.net/spec/geospatial-user-feedback/2.0/req/quality-common>] has a single conformance class, Quality Common: [<http://www.opengis.net/spec/geospatial-user-feedback/2.0/conf/quality-common>]. This class targets clients and services implementing quality or user feedback models.
- Requirements Class Feedback-Item [<http://www.opengis.net/spec/geospatial-user-feedback/2.0/req/feedback-item>] has a single conformance class, Feedback-item: [<http://www.opengis.net/spec/geospatial-user-feedback/2.0/conf/feedback-item>]. This class targets clients and services implementing user feedback models.
- Requirements Class Feedback-Summary [<http://www.opengis.net/spec/geospatial-user-feedback/2.0/req/feedback-summary>] has a single conformance class, Feedback-summary: [<http://www.opengis.net/spec/geospatial-user-feedback/2.0/conf/feedback-summary>]. This class targets clients and services implementing user feedback models.
- Requirements Class Feedback-Collection [<http://www.opengis.net/spec/geospatial-user-feedback/2.0/req/feedback-collection>] has a single conformance class, Feedback-collection: [<http://www.opengis.net/spec/geospatial-user-feedback/2.0/conf/feedback-collection>]. This class targets clients and services implementing user feedback models.

Conformance with this Standard shall be checked using all the relevant tests specified in Annex A (normative) of this document. The framework, concepts, and methodology for testing, and the criteria to be achieved to claim conformance are specified in the OGC Compliance Testing Policies and Procedures and the OGC Compliance Testing web site<sup>1</sup>.

To conform to this OGC Model, a software implementation may choose to implement the following.

- a) Any encoding extension associated with this Standard. Initially an XML encoding following the ISO19139 encoding rules is provided in a separate part (OGC 23-061, OGC Geospatial User Feedback Standard: XML Implementation v.2.0).
- b) A JSON encoding will be also provided as a separate part.

All requirements-classes and conformance-classes described in this Standard are owned by the standard(s) identified.

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<sup>1</sup>[www.opengeospatial.org/cite](http://www.opengeospatial.org/cite)



3

# NORMATIVE REFERENCES

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# 3

## NORMATIVE REFERENCES

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The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO: ISO 19115-1:2014, *Geographic information – Metadata – Part 1: Fundamentals*. International Organization for Standardization, Geneva (2014). <https://www.iso.org/standard/53798.html>.

ISO: ISO 19157:2013, *Geographic information – Data quality*. International Organization for Standardization, Geneva (2013). <https://www.iso.org/standard/32575.html>.

Policy SWG: OGC 08-131r3, *The Specification Model – Standard for Modular specifications*. Open Geospatial Consortium (2009). [https://portal.ogc.org/files/?artifact\\_id=34762](https://portal.ogc.org/files/?artifact_id=34762).

4

# TERMS AND DEFINITIONS

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# 4

## TERMS AND DEFINITIONS

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This document uses the terms defined in [OGC Policy Directive 49](#), which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this document and OGC documents do not use the equivalent phrases in the ISO/IEC Directives, Part 2.

This document also uses terms defined in the OGC Standard for Modular specifications ([OGC 08-131r3](#)), also known as the ‘ModSpec’. The definitions of terms such as standard, specification, requirement, and conformance test are provided in the ModSpec.

For the purposes of this document, the following additional terms and definitions apply.

This document uses the terms defined in Sub-clause 5.3 of OGC 06-121r9 [1], which is based on the ISO/IEC Directives, Part 2, Rules for the structure and drafting of International Standards. In particular, the word “shall” (not “must”) is the verb form used to indicate a requirement to be strictly followed to conform to this standard. It also uses definitions from the first version of the conceptual model OGC 15-097r1:2016 [7].

For the purposes of this document, the following additional terms and definitions apply.

### 4.1. citation

---

information object containing information that directs a reader’s or user’s attention from one resource to another

[SOURCE: ISO 24619:2011]

### 4.2. item

---

anything that can be described and considered separately

[SOURCE: ISO 19157:2013]

## 4.3. metadata

---

information about a resource

[SOURCE: ISO 19115-1:2014]

## 4.4. quality

---

degree to which a set of inherent characteristics fulfils requirements

[SOURCE: ISO 9000:2005]

## 4.5. rating

---

component of a user feedback item that subjectively classifies a resource in a short list of ordered categories

NOTE 1: The five star system is one of the most popular rating systems in the web. 5 stars means very good and 1 star means very bad.

[SOURCE: OGC 15-097r1]

## 4.6. user

---

consumer of a resource

[SOURCE: OGC 15-097r1]

## 4.7. user comment

---

component of a user feedback item providing textual information with no structure

[SOURCE: OGC 15-098r1]

## 4.8. user feedback

---

information about a resource directly provided by users

[SOURCE: OGC 15-097r1]

## 4.9. user feedback item

---

unit of information provided by a user about related resources as a result of its usage

[SOURCE: OGC 15-097r1]

## 4.10. user feedback collection

---

collection of feedback items that are grouped by criteria, or are the result of a query

[SOURCE: OGC 15-097r1]

## 4.11. user feedback summary

---

statistical summary of a feedback collection

[SOURCE: OGC 15-097r1]

5

# CONVENTIONS

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## 5.1. Data dictionary tables

The data dictionary for the GUF Conceptual Model is specified in a series of tables. The contents of the columns in these tables are described in Table 1.

**Table 1** – Contents of data dictionary tables

COLUMN TITLE	COLUMN CONTENTS
Name (left column)	<p><i>“name”</i> is the UML model attribute or association role name.</p> <p>The <i>name</i> capitalization rules used are specified in Subclause 11.6.2 of OGC 06-121r9 [1]. Some <i>names</i> in the tables may appear to contain spaces, but no <i>names</i> contain spaces.</p> <p>Examples: “target”, “itemIdentifier”</p>
Definition (second column)	<p>Specifies the definition of this element (omitting unnecessary words such as “a”, “the”, and “is”). If the element aims to contain the identifier of something, not a description or definition, the definition of this element should read something like “Identifier of ...”.</p> <p>Examples: “Link to the actual geospatial resource the publication is about.”, “Identifier for the feedback item”</p>
Data type and value (third column) or Data type (if no second items are included in rows of table)	<p>Normally contains two items:</p> <p>The first item is often the data type used for this element, using data types appropriate in a UML model, in which this element is a named attribute of a UML class. Alternately, the first item can identify the data structure (or class) referenced by this association, and references a separate table used to specify the contents of that class (or data structure).</p> <p>The optional second item in the third column of each table should indicate the source of values for this element, the alternative values, or other value information, unless the values are quite clear from other listed information.</p> <p>Examples: “ISO 19115-1 CI_Citation data type (ISO 19115-1:2014 B.3.2.1)”, “MD_Identifier (ISO 19115-1:2014 B.3.3.3)”</p>
Multiplicity and use (right or fourth column) or Multiplicity (if are no second items are included in rows of table)	<p>Normally contains two items:</p> <p>The first item specifies the multiplicity and optionality of this element in this data structure, either “One (mandatory)”, “One or more (mandatory)”, “Zero or one (optional)”, or “Zero or more (optional)”.</p> <p>The second item in the right column of each table specifies how any multiplicity other than “One (mandatory)” is used. If that element is optional, under what condition(s) shall that element be included or not included? If that element can be repeated, for what is that parameter repeated?</p>

COLUMN TITLE	COLUMN CONTENTS
	Example: “Zero or more (optional). If the target of the citation is specified by another part of the data model this parameter should not be used.”, “One (mandatory)”

When the data type in the third column is an enumeration or a code list, and the list of possible values is too extensive, the values and their meanings are detailed in a separate table. This separate table is then referenced in the third column of the original table row.

The data type of many parameters, in the third table column, is specified as “Character String type, not empty.”

The content of these data dictionary tables are normative, including any table footnotes.

In the data dictionary tables three background colors are used:

- grey is used when the class is an extension on a previous one, so those are the inherited elements, defined in the original class (e.g. in CI\_Citation which is extended by QCM\_Publication);
- green is used to identify elements that have been added from the first version of the GUF conceptual model defined in OGC 15-097r1 [7]; and
- blue is used to identify elements that have changed from the first version of the GUF conceptual model defined in OGC 15-097r1 [7].

Thus, elements with no background color in the dictionary tables have not changed from the first version of the conceptual model or the change is only in the description (for clarity) but not in the element itself. The use of background colors in the dictionary tables is intended to allow a reader to better identify changes from the GUF conceptual model v.1.0.

## 5.2. UML Notations

Unified Modeling Language (UML) static structure diagrams appearing in this standard are used as described in Sub clause 5.2 of OGC Web Service Common OGC 06-121r9 [1]. Further, the following conventions hold:

- UML elements in white color come from ISO 19115-1:2014 [5] or ISO 19157:2013 [3];
- UML element names with prefix QCM (Quality Common Metadata) are those defined in the <http://www.opengis.net/spec/geospatial-user-feedback/2.0/req/quality-common> requirements class of this Standard;
- UML element names with prefix GUF (Geospatial User Feedback) are those defined in the <http://www.opengis.net/spec/geospatial-user-feedback/2.0/req/feedback-item> requirements class of this Standard;

- UML element names with prefix UFS (User Feedback Summary) are those defined in the <http://www.opengis.net/spec/geospatial-user-feedback/2.0/req/feedback-summary> requirements class of this Standard; and
- UML element names with prefix UFC (User Feedback Collection) are those defined in the <http://www.opengis.net/spec/geospatial-user-feedback/2.0/req/feedback-collection> requirements class of this Standard.

## 5.3. Core and Extension Breakdown

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The OGC Geospatial User Feedback (GUF) Standard follows the modular specification design pattern as described in OGC 08-131r3 [6]. The contributors to the GUF Standard decided that the requirements would be split into a core (quality common and geospatial user feedback item) and extensions for summary statistics and geospatial user feedback collections. In addition, other standards in the GUF series will provide specific encodings of the data model specified in this document. For example, the OGC Geospatial User Feedback Standard OGC 23-061 [8] XML Encoding Extension v 2.0 is initially provided for this v.2.0 of the conceptual model. A JSON encoding is expected in the near future.

## 5.4. Geospatial User Feedback

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In addition to metadata provided by the original data provider describing geospatial resources, many users report that they trust data based on information about studies performed by their peers. An important element of that trust constitutes not only linking datasets with relevant citations in the scholarly literature, but also a desire for less formal feedback mechanisms such as user comments. As user feedback is a key driver for providers to improve their data products, some data providers have also expressed their desire for a standard such as GUF. (Note that ISO 19115 defines a ‘Citation’ class, but currently this is mainly used to specify a mechanism for citing a dataset, not for linking to external publications about the dataset.). In ISO 19115-1:2014 – Geographic information – Metadata, the MD\_Usage class is an attempt to address this need, but it appears not to be a suitable or successful means to record user feedback information.

The purpose of providing user feedback is to inform other users and data providers about use cases and experiences using a given geospatial resource. The goal is to collect requirements for data that providers can incorporate into objective quality measures for their products, allowing providers to meet the real needs of users and potentially to find new markets for their data.

In order to allow for simple user interfaces that can cover different levels of expertise on geospatial data usage, the GUF model is designed to be as simple as possible but comprehensive enough. Following are examples of what the GUF model allows:

- Commenting, asking questions, providing answers (the GUF\_UserComment class);

- Rating data (GUF\_Rating);
- Citing publications (QCM\_Publication);
- Providing a quality measure (additionalQuality) ;
- Documenting additional lineage information (additionalLineageSteps);
- Describing the usage (GUF\_UsageReport or GUF\_ReproducibleUsage); or
- Emphasizing a significant event that conditions the interpretation of a dataset (GUF\_SignificantEvent).

As in the first version of the GUF conceptual model [7], each one of the previous examples is considered an “item” of feedback. Feedback items can be arranged in collections and a summary description of the collection is also modeled. Geospatial User Feedback can be provided for both data or metadata.

## 5.5. Quality Common

---

The GUF Standard reuses elements of the geospatial metadata work and standard [ISO19115-1]. This forms the basis of a data model class list that is common and useful for both quality metadata and user feedback metadata. Some classes have been added to meet the requirements for expressing user feedback.



6

# REQUIREMENTS CLASS “QUALITY-COMMON”

---

# 6

## REQUIREMENTS CLASS “QUALITY-COMMON”

### 6.1. Overview

REQUIREMENTS CLASS 1: REQUIREMENTS CLASS 'QUALITY-COMMON'	
IDENTIFIER	<a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common">https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common</a>
TARGET TYPE	Quality-Common
CONFORMANCE CLASS	Conformance class A.1: <a href="http://www.opengis.net/spec/guf-conceptual/2.0/conf/quality-common">http://www.opengis.net/spec/guf-conceptual/2.0/conf/quality-common</a>
PREREQUISITES	Requirement 1: <a href="/req/quality-common/citation-of-publications">/req/quality-common/citation-of-publications</a> Requirement 2: <a href="/req/quality-common/discovered-issue">/req/quality-common/discovered-issue</a> Requirement 3: <a href="/req/quality-common/reproducible-usage">/req/quality-common/reproducible-usage</a>
NORMATIVE STATEMENT	Requirement 1-1: ISO19115-1 and ISO19157 data models

The Quality-Common requirements class defines the data model classes that are common to, and useful for, both quality metadata generated by producers as well as user feedback metadata. For this reason, the common data model classes are kept in a separate requirements class and related conformance class. In essence, this conformance class represents the foundations for building a user feedback model. This requirements class has specific dependencies on the ISO 19115-1:2014 and the ISO 19157:2013 metadata models (such as CI\_Citation, CI\_Date, etc) and adds three extra classes for citing publications (QCM\_Publications), for reporting discovered issues (QCM\_DiscoveredIssues) and for reporting reproducible usage (QCM\_ReproducibleUsage).

### 6.2. Citation of publications

CI\_Citation was initially designed to cite geospatial datasets. In the following requirement, the Quality Common requirements class is extended to make it more suitable for citing publications.

REQUIREMENT 1
IDENTIFIER <a href="/req/quality-common/citation-of-publications">/req/quality-common/citation-of-publications</a>

## REQUIREMENT 1

The implementations of a citation of a publication SHALL follow the UML model as shown in Figure 1 with the properties specified in Table 2, Table 3 and Table 4.<sup>1</sup>

<sup>1</sup> This model extends ISO 19115-1:2014 CI\_Citation with elements for publications.

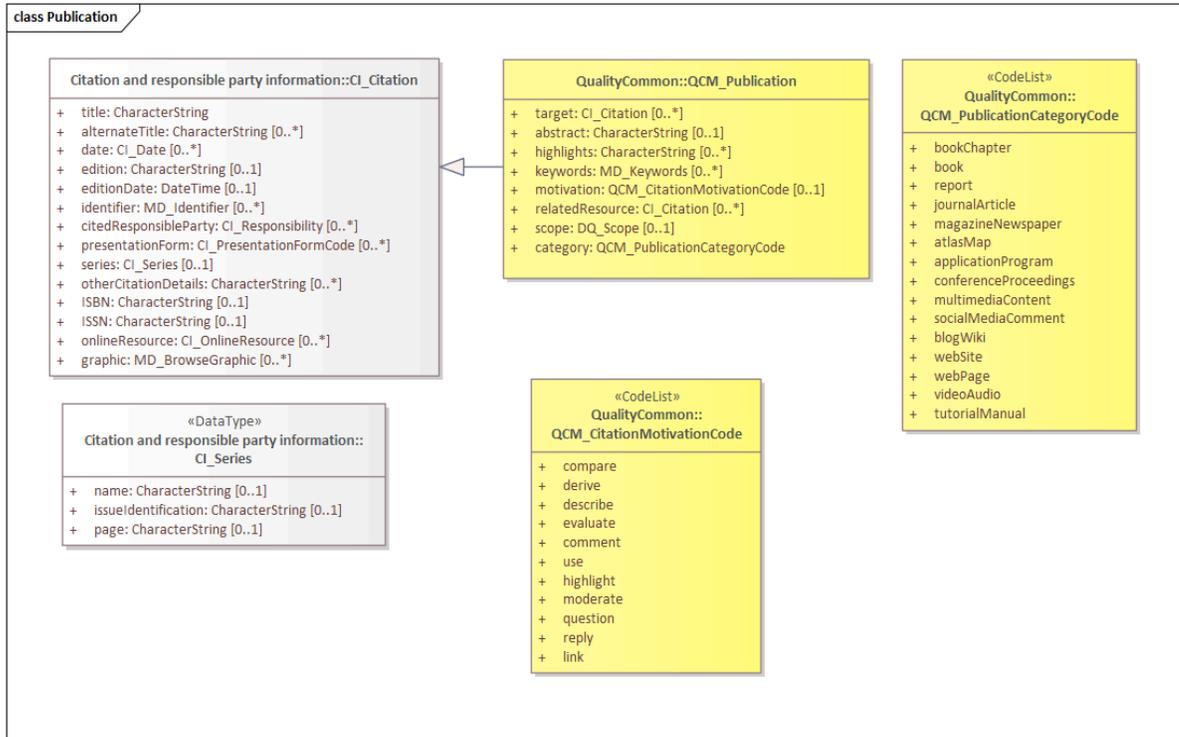


Figure 1 – QCM\_Publication in UML

Table 2 – QCM\_Publication extension elements

NAMES	DEFINITION	DATA TYPES AND VALUES	MULTIPLICITY AND USE
title	Name by which the cited resource is known	Character String type, not empty	One (mandatory)
alternateTitle	Short name or other language name by which the cited information is known	Character string type, not empty	Zero or many (optional)
date	Reference date for the cited resource	CI_Date (ISO 19115-1:2014 B.3.2.6)	Zero or many (optional)
edition	Version of the cited resource	Character String type, not empty	Zero or one (optional)
editionDate	Date of the edition	DateTime (ISO 19115-1:2014 B.4.2)	Zero or one (optional)

NAMES	DEFINITION	DATA TYPES AND VALUES	MULTIPLICITY AND USE
identifier	Value uniquely identifying an object within a namespace	MD_Identifier (ISO 19115-1:2014 B.3.3.3)	Zero or more (optional)
citedResponsibleParty	Roles, name, contact, and position information for an individual or organization that is responsible for the resource	CI_Responsibility (ISO 19115-1:2014 B.3.2.2)	Zero or more (optional)
presentationForm	Mode in which the resource is represented	CI_PresentationFormCode (B.5.4)	Zero or more (optional)
series	Information about the series, or aggregate resource, of which the resource is a part	CI_Series (ISO 19115-1:2014 B.3.2.9)	Zero or one (optional)
otherCitationDetails	Other information required to complete the citation that is not recorded elsewhere	Character String type, not empty	Zero or more (optional)
ISBN	International Standard Book Number	Character String type, not empty	Zero or one (optional)
ISSN	International Standard Serial Number	Character String type, not empty	Zero or one (optional)
onlineResource	Online reference to the cited resource	CI_OnlineResource (ISO 19115-1:2014 B.3.2.8)	Zero or more (optional)
graphic	Citation graphic or logo for the cited resource	MD_BrowseGraphic (ISO 19115-1:2014 B.3.3.4)	Zero or more (optional)
target	Link to the actual geospatial resource the publication is about.	ISO 19115-1 CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or more (optional). If the target of the citation is specified by another part of the data model this parameter should not be used.
abstract	Abstract of the publication <sup>a</sup>	Character String type, not empty	Zero or one (optional)
highlights	Highlights of the publication	Character String type, not empty	Zero or more (optional)
keywords	Keywords of the publication	MD_Keyword (ISO 19115-1:2014 B.2.3.2)	Zero or more (optional)
motivation	Purpose of the citation. Why the citation is	QCM_CitationMotivationCode type. See Table 3	Zero or one (optional)

NAMES	DEFINITION	DATA TYPES AND VALUES	MULTIPLICITY AND USE
	provided in relation to the parent class or the target.		
relatedResource	Other resources that are mentioned by the publication cited.	ISO 19115-1 CI_Citation data type.	Zero or more (optional)
scope	Scope of the citation (e.g. the extent the citation is covering).	ISO 19115-1 DQ_Scope data type	Zero or one (optional). Default value is the whole target
category	Type of publication	QCM_PublicationCategory Code type. See Table 4	One (mandatory)

<sup>a</sup> The need for including an abstract in CI\_Citation was also acknowledged by ISO 19157:2013, which defines a StandAloneQualityReport having a summary and a CI\_Citation as parameters

**Table 3 – QCM\_CitationMotivationCode type**

NAME	DEFINITION
compare	Compares the target resource with others. relatedResource can indicate the compared dataset's identifier. (comes from a GeoViQua use case)
derive	Derives a new target from this target resource. relatedResource can indicate the derived target identifier. (comes from a GeoViQua use case)
describe	Describes the target. (comes from W3C annotations)
evaluate	Evaluates the target, including its quality. This may also be used by producers to append publications on CAL-VAL results. (comes from a GeoViQua use case)
comment	Provides comments about the target resource. (comes from W3C annotations)
use	Comments on the target resource, including its quality. (comes from a GeoViQua use case)
highlight	Highlights a part of the target resource. It may emphasize a problem in a section of the target resource or an interesting discovery. In this case DQ_Scope should be used to mark the highlighted area. (comes from W3C annotations)
moderate	Assignment of value or quality to the target resource. It aims to moderate it up in a trust network or threaded discussion. (comes from W3C annotations)
question	Asks a question about the target resource. Can be used to question the veracity or the creation methodology of the target resource. (comes from W3C annotations)
reply	Contains a reply/answer to a previous publication. It can be a publication that responds to a "question" motivated publication. (comes from W3C annotations)
link	Links the target resource to a publication. Use this as a default value. In fact, any citation of a publication is a link between a resource and the publication (whatever the motivation is), so by selecting "link" we are expressing no additional motivation. (comes from W3C annotations)

**Table 4** – QCM\_PublicationCategoryCode type

NAME	DEFINITION
bookChapter	Book chapter
book	Book
report	report
journalArticle	Journal article
magazineNewspaper	Magazine or a news paper
atlasMap	Atlas or a map in printed or digital form
applicationProgram	Application program or a piece of software
conference Proceedings	Conference proceeding available in a book or in Internet
multimediaContent	A multimedia data package conceived to be distributed as a digital publication in a physical support (e.g., CD, DVD, Blue Ray, Flash Drive, etc) or available in Internet (such as an interactive encyclopedia of old maps)
socialMediaComment	Social media comment or entry, e.g., a tweet
blogWiki	Blog post or a wiki entry
webSite	Complete web site
webPage	web page
videoAudio	Video, audio or a similar form of multimedia content
tutorialManual	Tutorial or a manual

### 6.3. Discovered issue

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ISO 19115 proposes the definition of a MD\_Usage to document usages of the geospatial resource. This element has been extended in ISO 19115-1:2014 by adding a new property identifiedIssues which allows reporting of known issues associated with the resource, as well as proposed solutions if available. As a more comprehensive alternative, the GUF Standard

proposes the following specific class to describe discovered issues of the resource, workarounds and proposed alternatives and solutions.

## REQUIREMENT 2

**IDENTIFIER** /req/quality-common/discovered-issue

**A** The implementations of a discovered issue SHALL follow the UML model as shown in Figure 2 with the properties specified in Table 5.

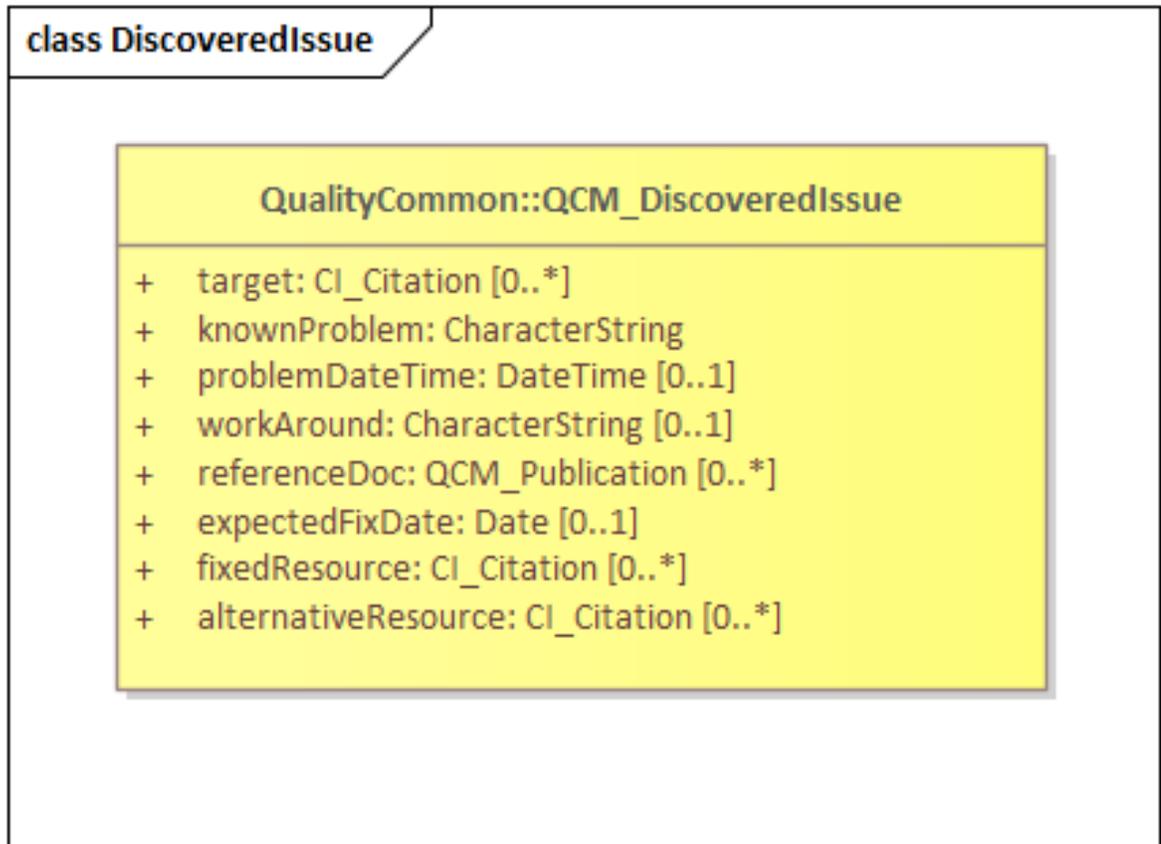


Figure 2 – QCM\_DiscoveredIssue in UML

Table 5 – QCM\_DiscoveredIssue data type

NAMES	DEFINITION	DATA TYPES AND VALUES	MULTIPLICITY AND USE
target	Link to the actual resource the discovered issue is about.	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or more (optional). If the target of the citation is specified by another part of the data model this parameter should not be used

NAMES	DEFINITION	DATA TYPES AND VALUES	MULTIPLICITY AND USE
knownProblem	Known issue with the target	Character String type, not empty	One (mandatory)
problemDateTime	Date and time when the problem was detected	DateTime (ISO 19115-1:2014 B.4.2)	Zero or one (optional)
workAround	Possible way to work around the problem	Character String type, not empty	Zero or one (optional)
referenceDoc	A publication that exposes the issue and eventually suggest a solution.	QCM_Publication. (See [tbl_publication])	Zero or more (optional)
expectedFixDate	Date when a solution is expected to be released by the provider in the form of a fixedResource or directly as a fix in the original target resource.	Date (ISO 19115-1:2014 B.4.2)	Zero or one (optional)
fixedResource	A new version of the target resource where the knownProblem is no longer present.	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or more (optional)
alternative Resource	An alternative resource that can be used instead of the target for similar purposes but does not present the knownProblem.	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or more (optional)

## 6.4. Reproducible usage

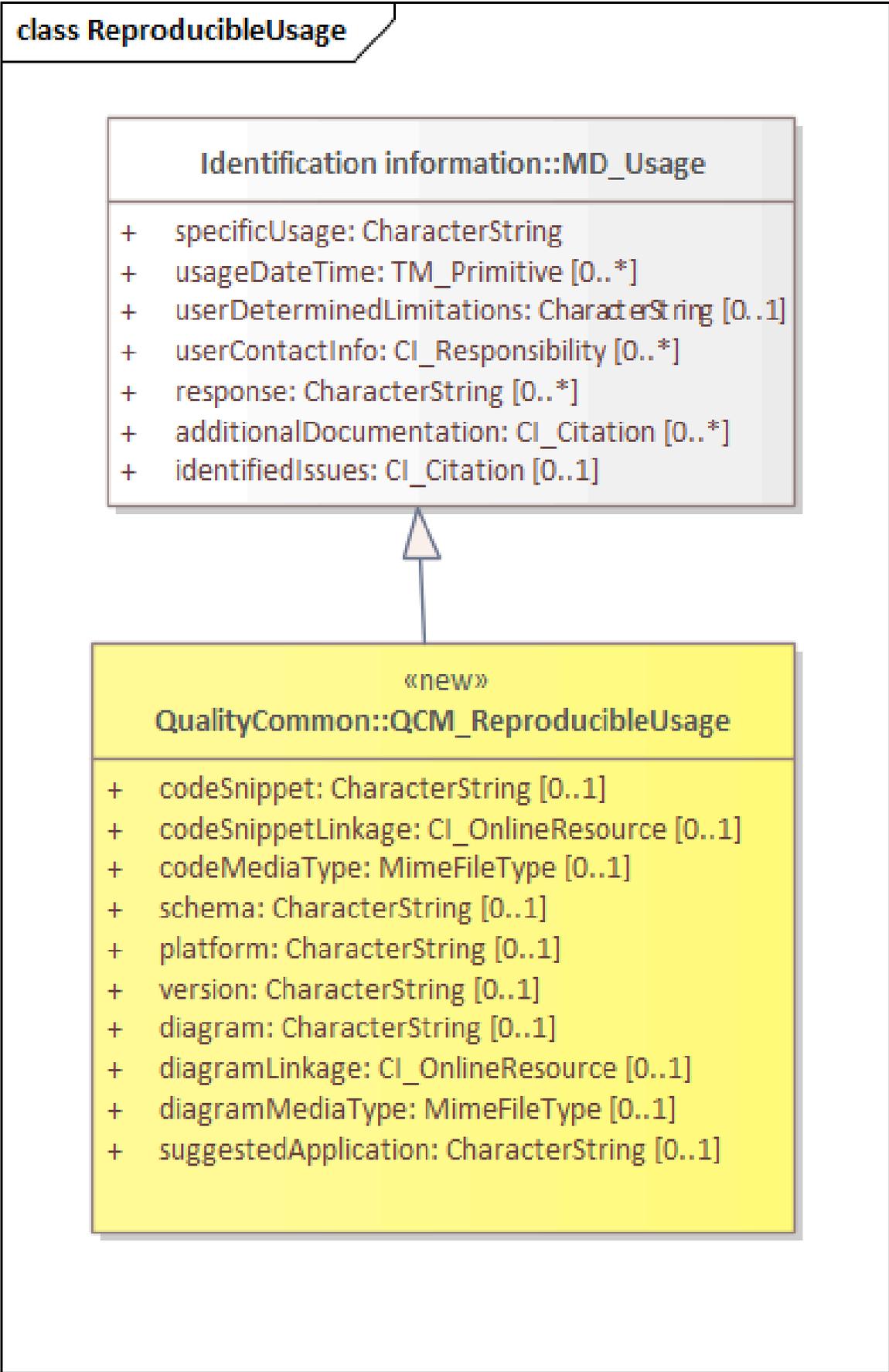
MD\_Usage was initially designed to document usages of a geospatial resource. In MD\_Usage, the specificUsage is a string. Version 2.0 of the GUF conceptual model proposes the following specific class to describe reproducible usage by defining elements to allow reproducibility, for example by describing a codeSnippet (as an string or a linkage) as well as in which application the snippet should be executed.

### REQUIREMENT 3

**IDENTIFIER** /req/quality-common/reproducible-usage

**A** The implementations of a reproducible usage SHALL follow the UML model as shown in Figure 3 with the properties specified in Table 6.<sup>1</sup>

<sup>1</sup> This model extends ISO 19115-1:2014 MD\_Usage with elements for reproducible usage.



**Table 6 – QCM\_ReproducibleUsage extension elements**

NAMES	DEFINITION	DATA TYPES AND VALUES	MULTIPLICITY AND USE
specificUsage	Brief description of the resource and/or resource series usage	Character String type, not empty	One (mandatory)
usageDateTime	Date an time of the first use or range of uses of the resource and/or resource series	TM_Primitive (ISO 19115-1:2014 B.4.4)	Zero or more (optional)
userDetermined Limitations	applications, determined by the user for which the resource and /or resource series is not suitable	Character string, not empty	Zero or one (optional)
userContactInfo	Identification of and means of communicating with person(s) and organization(s) using the resource	CI_Responsibility (ISO 19115-1:2014 B.3.2.2)	Zero or more (optional)
response	response to the user-determined limitations. E.G.'this has been fixed in version x'	Character string, not empty	Zero or more (optional)
additionalDocumentation	Publications that describe usage of data	CI_Citation (B.3.2.1)	Zero or more (optional)
identifiedIssues	Citation of a description of known issues associated with the resource along with proposed solutions if available	CI_Citation (ISO 19115-1:2014 B.3.2.1)	Zero or one (optional)
codeSnippet	A fragment of code or execution sentence necessary to reproduce this usage. code Snippet is mandatory if codeSnippetLinkage is not documented	Character string, not empty	Zero or one (optional)
codeSnippetLinkage	URL to the code or execution sentence necessary to reproduce this usage. code SnippetLinkage is mandatory if codeSnippet is not documented	CI_OnlineResource (ISO 19115-1:2014 B.3.2.8)	Zero or one (optional)
codeMediaType	Format of the necessary code or execution sentence to reproduce this usage	Mime file type	Zero or one (optional)
platform	Platform to execute the code or execution sentence of this usage	Character String type, not empty	Zero or one (optional)
version	Version of the platform to execute the code or execution sentence of this usage	Character String type, not empty	Zero or one (optional)
schema	Schema of the code or execution sentence to reproduce this usage (only for declarative code: e.g., JSON)	Character String type, not empty	Zero or one (optional)
suggestedApplication	Specific suggested application to open the code or execution sentence of this usage	Character String type, not empty	Zero or one (optional)
diagram	Descriptive diagram of this reproducible usage <sup>a</sup>	Character String type, not empty	Zero or one (optional)

NAMES	DEFINITION	DATA TYPES AND VALUES	MULTIPLICITY AND USE
diagramLinkage	URL Link of the descriptive diagram of this reproducible usage <sup>a</sup>	CI_OnlineResource (ISO 19115-1:2014 B.3.2.8)	Zero or one (optional)
diagramMediaType	Format of the descriptive diagram of this reproducible usage	Mime file type	Zero or one (optional)
<sup>a</sup> Usually a single diagram description is provided (text or URL)			



7

# REQUIREMENTS CLASS “FEEDBACK-ITEM”

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# 7

## REQUIREMENTS CLASS “FEEDBACK-ITEM”

### 7.1. Overview

The Feedback-Item requirements class defines the data model classes that are involved in the definition of an individual user feedback item. A feedback item is the container of the actual feedback. Every item is set into a context by a combination of target, citations, and scope.

#### REQUIREMENTS CLASS 2: REQUIREMENTS CLASS ‘FEEDBACK-ITEM’

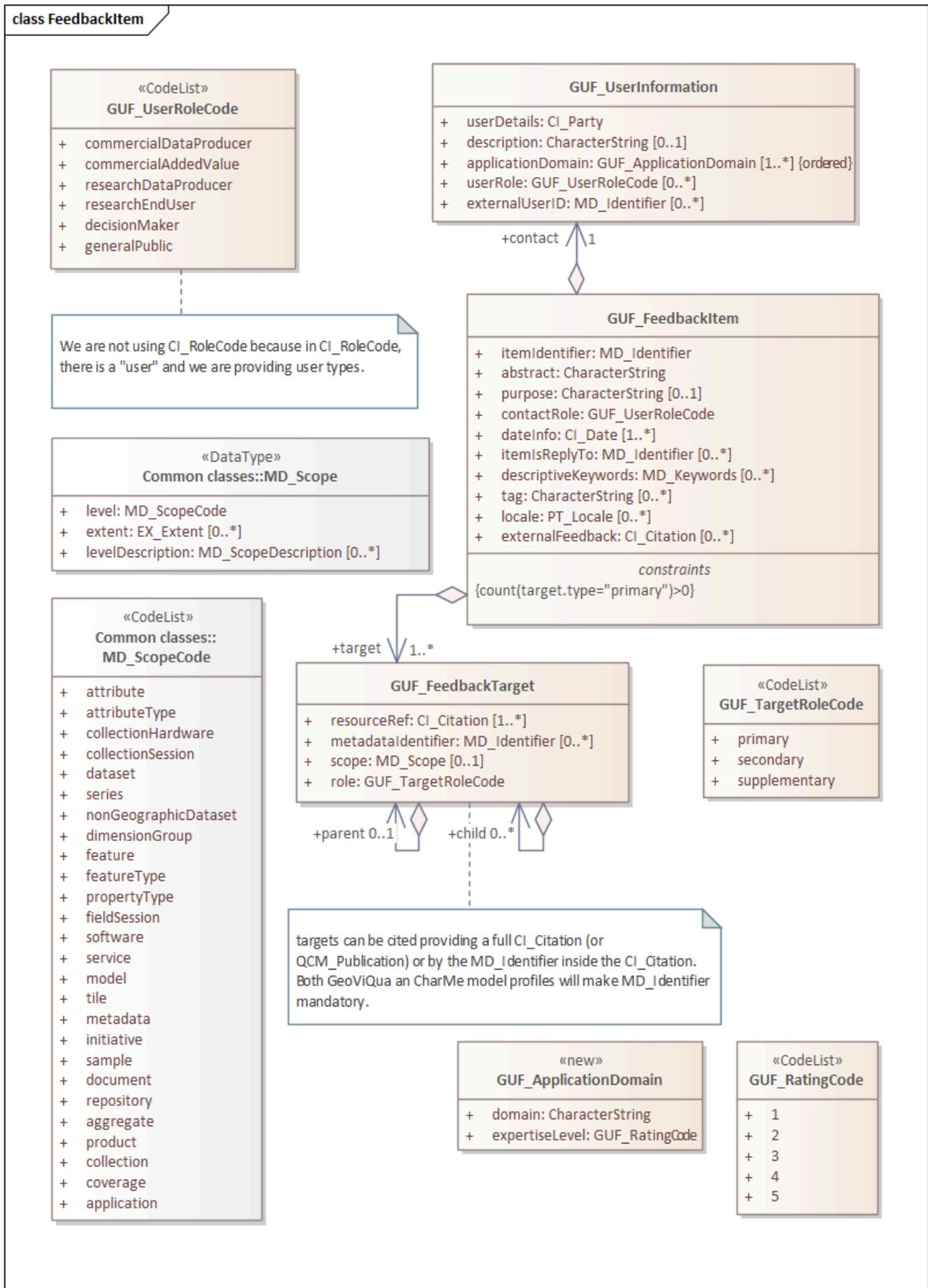
IDENTIFIER	<a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-item">https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-item</a>
TARGET TYPE	Feedback-Item
CONFORMANCE CLASS	Conformance class A.2: <a href="http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-item">http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-item</a> <a href="/req/quality-common/citation-of-publications">/req/quality-common/citation-of-publications</a>
REQUIREMENT	<a href="/req/quality-common/discovered-issue">/req/quality-common/discovered-issue</a> <a href="/req/quality-common/reproducible-usage">/req/quality-common/reproducible-usage</a>
INHERIT	<a href="/req/feedback-item/item">/req/feedback-item/item</a>

### 7.2. Feedback-Item

#### REQUIREMENT 4

IDENTIFIER </req/feedback-item/item>

A The implementations of a feedback item SHALL follow the UML model as shown in Figure 4 and Figure 5 with the properties specified in Table 7.



**Figure 4 – GUF\_FeedbackItem (fragment), GUF\_UserInformation and GUF\_FeedbackTarget in UML**

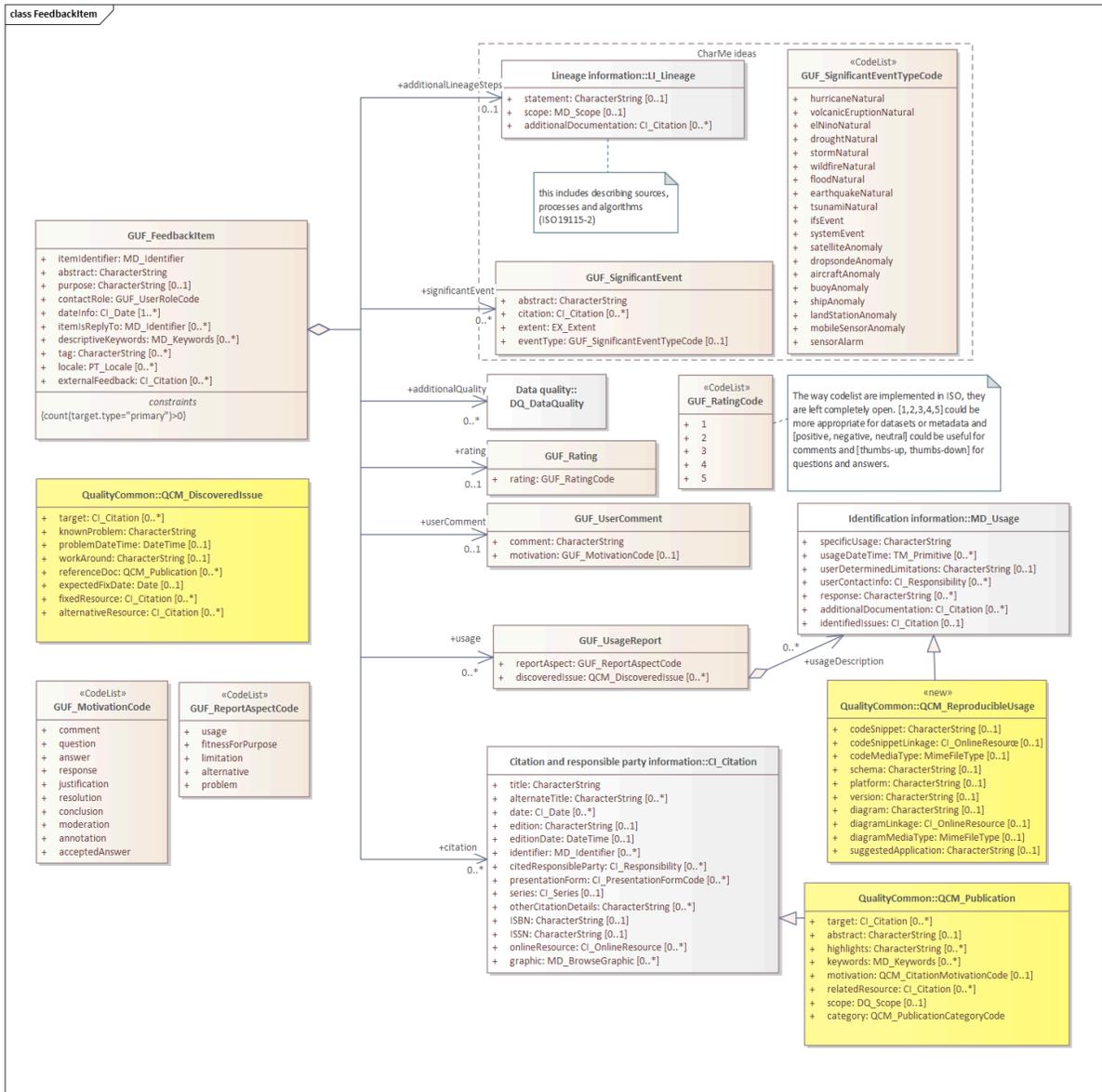


Figure 5 – GUF\_FeedbackItem (fragment), description in UML

Table 7 – GUF\_FeedbackItem data type

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
itemIdentifier	Identifier for the feedback item.	MD_Identifier data type (ISO 19115-1:2014 B.3.3.3)	One (mandatory)
abstract	Brief narrative description of this item, normally for display to a human.	Character String type, not empty	One (mandatory)

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
purpose	Summary of the intentions with which the feedback was provided	Character String type, not empty	Zero or one (optional)
contact	Information about the user providing feedback	GUF_UserInformation data type (Table 8)	One (mandatory)
contactRole	User's role in the context of this feedback item. A user may have several roles recorded in the GUF_User Information, but this is the one that applies for this feedback <sup>a</sup> .	GUF_UserRoleCode (see Table 10)	One (mandatory)
dateInfo	Date when the feedback item was created, updated etc.	CI_Date (ISO 19115-1:2014 B.3.2.6)	One or more (mandatory)
itemsReplyTo	Identifiers of one or more items of feedback to which this item is a response.	MD_Identifier data type (ISO 19115-1:2014 B.3.3.3)	Zero or more (optional). Populate only if the feedback item is responding to another feedback item (e.g. an answer to a previous comment).
descriptiveKeywords	Keywords that can be useful to search for this item. They are selected from controlled vocabularies	MD_Keywords data type (ISO 19115-1:2014 B.2.3.2)	Zero or more (optional)
tag	Free text word that can be useful to search for this item.	Character String type, not empty	Zero or more (optional)
locale	Language and character set used within the feedback item	PT_Locale data type (ISO 19115-1:2014 B.3.4.3)	Zero or more (optional)
externalFeedback	Link to an item in an external repository that contains the feedback (not described inline).	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or one (optional) <sup>b</sup>
additionalQuality	Structured quality assessment result	DQ_DataQuality data type (ISO 19157:2013 C.2.1.1)	Zero or more (optional) <sup>b</sup>
userComment	Text free user comment	GUF_UserComment data type (see Table 13)	Zero or one (optional) <sup>b</sup>

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
usage	Structured usage report	GUF_UsageReport (see Table 15)	Zero or more (optional) <sup>b</sup>
rating	Rating code reflecting the satisfaction of the user with the resource used	GUF_Rating (see Table 17)	Zero or one (optional) <sup>b</sup>
citation	Citation of a published resource (e.g., a report, a peer reviewed paper) that provides an evaluation of the usage of the resource	CI_Citation data type (ISO 19115-1:2014 B.3.2.1) or, preferably, QCM_Publication data type (see Table 2)	Zero or more (optional) <sup>b</sup>
additionalLineageSteps	Additional lineage steps not included in the producer metadata	LI_Lineage data type (ISO 19115-1:2014 B.2.5)	Zero or one (optional) <sup>b</sup>
significantEvent	Significant natural events or sensor or platform anomalies that can affect the interpretation of the data.	GUF_SignificantEvent (see Table 18)	Zero or more (optional) <sup>b</sup>
target	Identifies a pre-existing resource (e.g., a dataset or a metadata record) from a catalogue.	GUF_FeedbackTarget (see Table 11)	One or more (mandatory)

<sup>a</sup> The idea is for a single user to be able to embody more than one role, but only one role in each item. Thus, a data producer employee may comment and normally speak freely as an end user, but may, for example, issue a metadata override on behalf of the data provider if s/he explicitly chooses that role. S/he would only be allowed to choose roles from his/her user information, and maybe there could be additional restrictions. So users seeking reliable but “semi-official” metadata could look for overrides issued by the provider in that role.

<sup>b</sup> If none of these elements are populated, the item does not provide feedback and should be considered empty.

**Table 8 – GUF\_UserInformation data type**

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
userDetails	Contact details about the user and its organization	CI_Party data type (ISO 19115-1:2014 B.3.2.3)	One (mandatory)
description	User short description or bio	Character string, not empty	Zero or one (optional)
application Domain	Application domain(s) a user works in	GUF_ApplicationDomain element	One or more (mandatory)
userRole	The roles the user can play	GUF_UserRoleCode code list (see Table 10)	Zero or more (optional)

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
externalUserID	User ID in an external system such as an ORCID	MD_Identifier data type (ISO 19115-1:2014 B.3.3.3)	Zero or more (optional)

**Table 9** – GUF\_ApplicationDomain data type

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
domain	An application domain a user works in	Character string, not empty	One (mandatory)
expertise Level	User's expertise level in this particular application domain, restricted by a codelist	GUF_RatingCode (see Table 20)	One (mandatory)

**Table 10** – GUF\_UserRoleCode code list

NAME	DEFINITION
commercialDataProducer	Commercial Data Producer
commercialAddedValue	Commercial Added Value
researchDataProducer	Scientific Data Producer
researchEndUser	Research End User
decisionMaker	Decision Maker
generalPublic	General Public

**Table 11** – GUF\_FeedbackTarget data type

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
resourceRef <sup>a</sup>	Reference to a resource (e.g., a dataset or metadata record) that is the target of the feedback item or a superset of the item <sup>b</sup>	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	One or more (mandatory) <sup>c</sup>
metadataIdentifier <sup>f</sup>	Identifier for a metadata record about the resource	MD_Identifier data type (ISO 19115-1:2014 B.3.3.3)	Zero or more (optional)

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
scope	Describes a type of resource the feedback is about, typically a dataset, a metadata record, a feature... or a subset of a dataset or resource.	MD_scope data type (ISO 19115-1:2014 B.3.3.1)	Zero or one (optional) <sup>b</sup>
role	The role of the target with respect to the feedback item <sup>g</sup>	GUF_TargetRoleCode code (see Table 12)	One (mandatory)
parent	Parent of the cited resource <sup>d</sup>	GUF_FeedbackTarget data type (see this table)	Zero or one (optional)
child	Child of the cited resource <sup>e</sup>	GUF_FeedbackTarget data type (see this table)	Zero or more (optional)

<sup>a</sup> Do not confuse this data type with itemsReplyTo in GUF\_FeedbackItem. In the case where a feedback item replies to another feedback item, this is indicated in itemsReplyTo. It is expected that the targets of both items are identical including the same resourceRef.

<sup>b</sup> If the reference cites a superset of the feedback target, use 'scope' to define the right subset of the resource referenced.

<sup>c</sup> If more than one is provided they shall point to the same resource. If there is more than one resource, use more than one GUF\_FeedbackTarget elements.

<sup>d</sup> This may be used to present feedback to users grouped by the parent resources. For example, a user evaluating the quality of a single remotely-sensed image tile may also wish to see feedback on the global set of tiles, or all feedback relating to the entire data collection campaign.

<sup>e</sup> If the target is a collection, this can be used to mention its members.

<sup>f</sup> If the resource is a metadata record, this element should not be populated; use resourceRef/citation/identifier instead.

<sup>g</sup> Corrigenda: in GUF v.1 Conceptual model documentation the role attribute appeared as "targetType". Not in the UML models and XSD schemas, where "role" attribute was correctly documented.

**Table 12 – GUF\_TargetRoleCode code list**

NAME	DEFINITION
primary	Identifies a pre-existing resource that is the subject of the feedback item, i.e., points to the resources the feedback is about.
secondary	Referenced resources, implying that the feedback item might be relevant to the referenced resource.
supplementary	Identifiers to additional references, e.g., another region in another dataset with similar problems. It is used to formally model references that somehow are related to the feedback item at hand but does not imply that the feedback is relevant for the referenced subject. (An exemplary resource reference should be of this code; such feedback would not typically be shown with the resource).

**Table 13 – GUF\_UserComment data type**

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
comment	Free text	Character String type, not empty	One (mandatory)
motivation	Motivation of the comment: it can be a comment, a question, an answer or a justification (e.g., a justification for a rating)	GUF_MotivationCode code list (see Table 14)	Zero or one (optional)

**Table 14 – GUF\_MotivationCode code list**

NAME	DEFINITION
comment	Isolated comment or a part of a discussion (a sequence of interrelated comments).
question	Question about a feedback target that awaits an answer.
answer	Answer (possibly one of several, possibly incorrect) to a previous “question” formulated in a previous feedback item (use itemsReplyTo to refer to a previous question or comment).
accepted Answer	The answer that has been accepted as best to a previous question formulated in a previous feedback item (use itemsReplyTo to refer to a previous question or comment).
response	Response or a reaction of the producer or other responsible party to another feedback item (e.g., a “comment” or a “discovered issue” of a usage problem) (use itemsReplyTo to refer to the item that motivated the response).
justification	Justification or explanation clarifying the reasoning in another part of the feedback item e.g., a rating.
resolution	Resolution declaring a discussion thread (a sequence of interrelated questions, answers, and comments) closed (use itemsReplyTo to refer to the last question, answer, or comment)
moderation	Reason why another feedback item has been moderated or censored.
annotation	Tag on a feature present in the data that incorporate information that can be later useful for others.
conclusion	The final or summary nature of a particular comment.

**Table 15 – GUF\_UsageReport data type**

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
reportAspect	Aspect reported	GUF_ReportAspectCode code list (see Table 16)	One (mandatory)

NAME	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
usage Description	Usage description or limitation of the target	MD_Usage code list (ISO 19115-1:2014 B.2.3.6)	Zero or more (optional)
discoveredIssue	Discovered issue in the target resource	QCM_DiscoveredIssue data type (see Table 5)	Zero or more (optional)

**Table 16** – GUF\_ReportAspectCode code list

NAME	DEFINITION
usage	Description of the usage of the target resource. At least one MD_Usage should be populated.
fitness ForPurpose	Description of a usage of the target resource that was appropriated for the intended purpose. At least one MD_Usage should be populated.
limitation	Description of a limitation of the target resource. At least one userDeterminedLimitations in MD_Usage should be populated.
alternative	Alternative route that helps to avoid a problem or a limitation. At least workAround or alternativeResource in one QCM_DiscoveredIssue should be populated.
problem	A report of a problem or an issue. At least one QCM_DiscoveredIssue should be populated.

**Table 17** – GUF\_Rating data type

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
rating	Rating in the form of a simple numeric code that qualifies subjectively the feedback target	GUF_RatingCode (see Table 20), GUF_ThumbsCode (see Table 21), GUF_SignCode (see Table 22) or other numerical code for rating	One (mandatory)

**Table 18** – GUF\_SignificantEvent data type

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
abstract	Brief narrative description of this event, normally for display to a human.	Character String type, not empty	One (mandatory)
citation	Citation of the event (e.g., a report describing the event, or an event identifier)	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or more (optional)
extent	Spatiotemporal extent of the event	EX_Extent data type (ISO 19115-1:2014 B.3.1.1)	One (mandatory)
event Type	Type of event	GUF_SignificantEventTypeCode (see Table 19)	Zero or one (optional)

**Table 19 – GUF\_SignificantEventTypeCode code list**

NAMES	DEFINITION
hurricaneNatural	Hurricane episode
volcanicEruptionNatural	Volcanic Eruption episode
elNinoNatural	El Nino natural event
droughtNatural	Remarkable drought episode
stormNatural	Remarkable Storm natural event
wildfireNatural	Remarkable Wildfire natural event
floodNatural	Remarkable Flood natural event
earthquakeNatural	Remarkable Earthquake natural event
tsunamiNatural	Remarkable Tsunami natural event
ifsEvent	Integrated Forecast System event (e.g., a problem)
systemEvent	Acquisition or distribution system event (e.g., a problem etc)
satelliteAnomaly	Abnormal data in a satellite system (e.g., a sensor glitch)
dropsondeAnomaly	Abnormal data from a dropsonde
aircraftAnomaly	Abnormal data from an airborne system (e.g., a sensor glitch)
buoyAnomaly	Abnormal data from a buoy
shipAnomaly	Abnormal data from a ship sensing system (e.g., a sensor glitch)
landStationAnomaly	Abnormal data from a land station (e.g., a sensor glitch)
mobileSensorAnomaly	Abnormal data from a mobile sensor anomaly (e.g., a sensor glitch)

NAMES	DEFINITION
sensorAlarm	Abnormal acquisition above or below normal parameters.

NOTE: This codelist is based on the CHARMe project [<https://cordis.europa.eu/project/id/312641>], which focused primarily on hazards and climatic analysis. Here, as in other parts of the data model, the codelist approach allows further domain-specific entities to be described and modeled.

### 7.3. Numeric Codelist for rating

A numeric is a codelist that has a correspondence to a numeric code. This allows for item sorting and numerical calculations such as totals and averages based on the numeric code. Table 20, Table 21 and Table 22 are examples of numeric codelists that can be used for rating.

GUF\_RatingCode is intended for implementing a 5 star rating system. This can be used for target resources or for user expertiseLevel. For example, this approach is currently used in amazon.com and many other websites.

**Table 20** – GUF\_RatingCode numeric code type

NUMBER	CODE	DEFINITION
1	oneStar	Very bad
2	twoStars	Bad
3	threeStars	Regular
4	fourStars	Good
5	fiveStars	Excellent

GUF\_ThumbsCode is intended for implementing an “I like” system. GUF\_ThumbsCode is expected to be used to give feedback on another feedback item, for example rating the comment of another user about a target resource. This is currently used in facebook.com “I like” and many other websites.

**Table 21** – GUF\_ThumbsCode numeric code type

NUMBER	CODE	DEFINITION
-1	thumbsDown	Thumbs down
1	thumbsUp	Thumbs up

GUF\_SignCode could be used to accompany textual GUF\_UserComment to give an indication if the comment is emphasizing a positive aspect, a neutral or a negative aspect (e.g. a complaint). E.g. this is currently used to rate user reputation in ebay.com.

**Table 22** – GUF\_SignCode numeric code type

NUMBER	CODE	DEFINITION
-1	negative	Negative
0	neutral	Neutral
1	positive	Positive

8

# REQUIREMENTS CLASS “FEEDBACK-SUMMARY”

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# 8

## REQUIREMENTS CLASS “FEEDBACK-SUMMARY”

### 8.1. Overview

The Feedback-Summary requirements class defines the data model classes that support encoding summary statistics of feedback items that share the same target.

#### REQUIREMENTS CLASS 3: REQUIREMENTS CLASS ‘FEEDBACK-SUMMARY’

IDENTIFIER	<a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary">https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary</a>
TARGET TYPE	Feedback-Summary
CONFORMANCE CLASS	Conformance class A.3: <a href="http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-summary">http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-summary</a>
REQUIREMENT	/req/user-feedback-item/item
INHERIT	/req/feedback-summary/summary-model

### 8.2. Feedback-Summary

#### REQUIREMENT 5

IDENTIFIER </req/feedback-summary/summary-model>

A

The implementations of a feedback summary SHALL follow the UML model as shown in Figure 6 with the properties specified in Table 23.

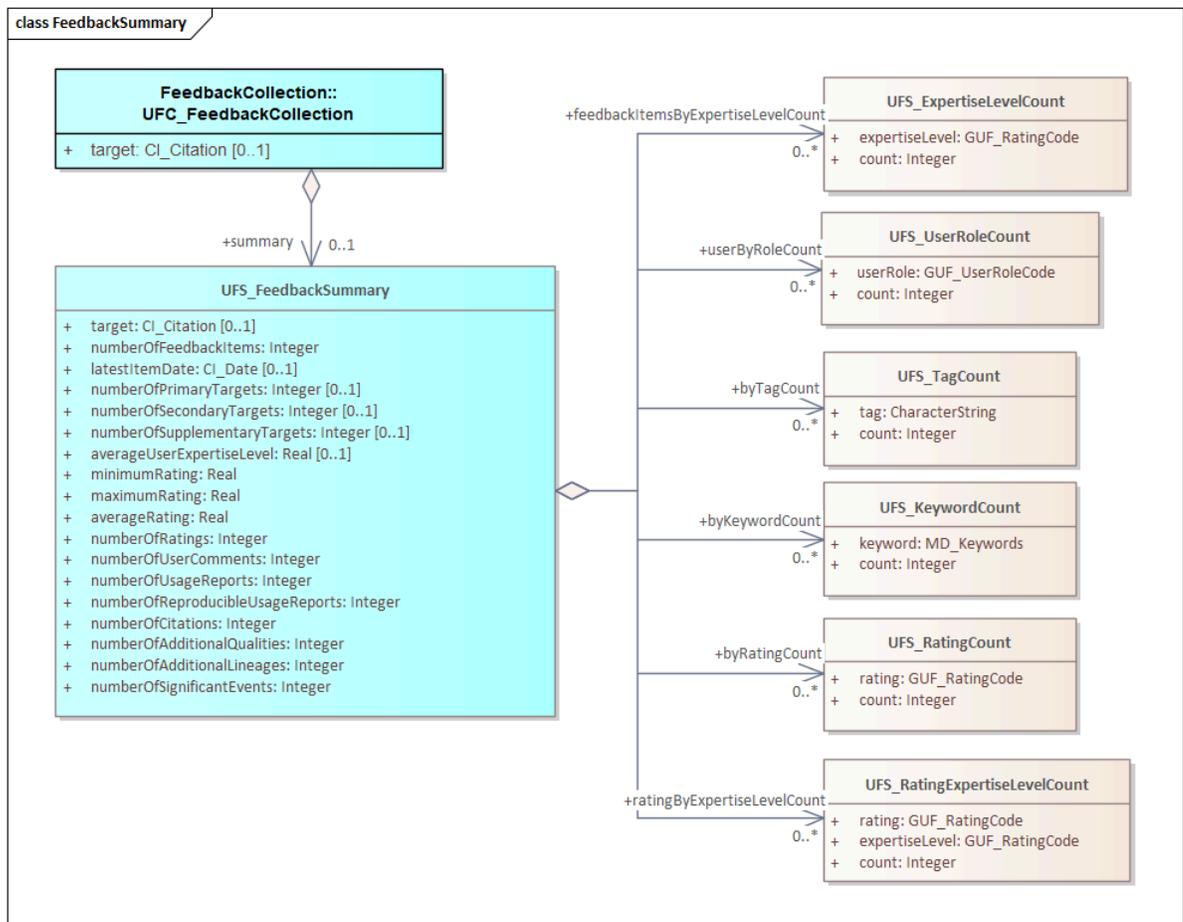


Figure 6 – UFS\_FeedbackSummary data model UML diagram

Table 23 – UFS\_FeedbackSummary data type

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
target	Common geospatial resource the summary is about.	ISO 19115-1 CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or one (optional). If the target of the citation is specified by another part of the data model this parameter should not be used
numberOfFeedbackItem	Number of Feedback items this summary is about	Integer type	One (mandatory)
latestItemDate	The date of the last item	CI_Date (ISO 19115-1:2014 B.3.2.6)	Zero or one (optional)

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
numberOfPrimaryTargets	Total number of primary targets	Integer type	Zero or one (optional)
numberOfSecondaryTargets	Total number of secondary targets	Integer type	Zero or one (optional)
numberOfSupplementaryTargets	Total number of supplementary targets	Integer type	Zero or one (optional)
averageUserExpertiseLevel	Average user expertise level	Real type	Zero or one (optional)
minimumRating	Minimum rating received. Numeric value	Real type	One (mandatory)
maximumRating	Maximum rating received. Numeric value	Real type	One (mandatory)
averageRating	Average rating	Real type	One (mandatory)
numberOfRatings	Number of feedback items with a valid rating	Integer type	One (mandatory)
numberOfUserComments	Number of feedback items with a valid comment	Integer type	One (mandatory)
numberOfUsageReports	Number of populated usage reports	Integer type	One (mandatory)
numberOfReproducibleUsageReports	Number of populated reproducible usage reports	Integer type	One (mandatory)
numberOfCitations	Number of populated citations	Integer type	One (mandatory)
numberOfAdditionalQualities	Number of populated quality elements	Integer type	One (mandatory)
numberOfAdditionalLineages	Number of feedback items with a valid reported lineage	Integer type	One (mandatory)

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
numberOfSignificantEvents	Number of populated significant events	Integer type	One (mandatory)
feedbackItemsByExpertiseLevel Count	Number of feedback items by each level of expertise	UFS_ExpertiseLevelCount data type (see Table 24)	Zero or more (optional) a
userByRoleCount	Number of feedback items for each user role	UFS_UserRoleCount data type (see Table 25)	Zero or more (optional) b
byTagCount	Number of feedback items for each tag	UFS_TagCount data type (see Table 26)	Zero or more (optional) c
byKeywordCount	Number of feedback items for each keyword	UFS_KeywordCount data type (see Table 27)	Zero or more (optional) d
byRatingCount	Number of feedback items for each rating value	UFS_RatingCount data type (see Table 28)	Zero or more (optional) e
ratingByExpertiseLevelCount	Number of feedback items for each rating and level of expertise	UFS_RatingExpertiseLevel Count data type (see Table 29)	Zero or more (optional) f

<sup>a</sup> In the case where feedbackItemsByExpertiseLevelCount occurs more than once, the expertiseLevel values shall be different for each.

<sup>b</sup> In the case where userByRoleCount occurs more than once, its userRole values shall be different.

<sup>c</sup> In the case where byTagCount occurs more than once, its tag values shall be different.

<sup>d</sup> In the case where byKeywordCount occurs more than once, its keyword values shall be different.

<sup>e</sup> In the case where byRatingCount occurs more than once, its rating values shall be different.

<sup>f</sup> In the case where ratingByExpertiseLevelCount occurs more than once, their rating / expertiseLevel pair values shall be different.

**Table 24 – UFS\_ExpertiseLevelCount data type**

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
expertise Level	A possible value of expertise level	GUF_RatingCode data type (see Table 20)	One (mandatory)
count	Number of feedback items that were populated by this expertiseLevel code	Integer data type	One (mandatory)

**Table 25 – UFS\_UserRoleCount data type**

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
user Role	A possible value of user role	GUF_UserRoleCode data type (see Table 10)	One (mandatory)
count	Number of times that a feedback items was populated by a user acting with this userRole code	Integer data type	One (mandatory)

**Table 26 – UFS\_TagCount data type**

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
tag	A possible value of tag	Character String data type not empty	One (mandatory)
count	Number of feedback items that were populated with this tag value	Integer data type	One (mandatory)

**Table 27 – UFS\_KeywordCount data type**

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
keyword	A possible value of keyword	MD_Keywords data type (ISO 19115-1:2014 B.2.3.2)	One (mandatory)
count	Number of feedback items that were populated with this keyword	Integer data type	One (mandatory)

**Table 28 – UFS\_RatingCount data type**

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
rating	A possible value of rating	GUF_RatingCode (see Table 20), GUF_ThumbsCode (see Table 21), GUF_SignCode (see Table 22) or other numerical code for rating	One (mandatory)
count	Number of feedback items that were populated with this rating code	Integer data type	One (mandatory)

**Table 29 – UFS\_RatingExpertiseLevelCount data type**

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
rating	A possible value of rating	GUF_RatingCode (see Table 20), GUF_ThumbsCode (see Table 21), GUF_SignCode (see Table 22) or other numerical code for rating	One (mandatory)
expertise Level	A possible value of expertise level	GUF_RatingCode data type (see Table 20)	One (mandatory)
count	Number of feedback items that were populated with this rating-expertiseLevel code pair	Integer data type	One (mandatory)

9

# REQUIREMENTS CLASS “FEEDBACK-COLLECTION”

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# 9

## REQUIREMENTS CLASS “FEEDBACK-COLLECTION”

### 9.1. Overview

The User Feedback Collection Extension requirements class defines the data model classes that supports grouping of feedback items into a feedback response and feedback collection with summary statistics. A feedback collection is a collection of feedback items that share a common target and share the same rating code list.

REQUIREMENTS CLASS 4: REQUIREMENTS CLASS ‘FEEDBACK-COLLECTION’	
IDENTIFIER	<a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-collection">https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-collection</a>
TARGET TYPE	Feedback-Collection
CONFORMANCE CLASS	Conformance class A.4: <a href="http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-collection">http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-collection</a>
REQUIREMENT	<a href="/req/feedback-summary/summary-model">/req/feedback-summary/summary-model</a> <a href="/req/feedback-collection/response">/req/feedback-collection/response</a>
INHERIT	<a href="/req/feedback-collection/collection">/req/feedback-collection/collection</a> <a href="/req/feedback-collection/pagination">/req/feedback-collection/pagination</a>

## 9.2. Feedback-Collection

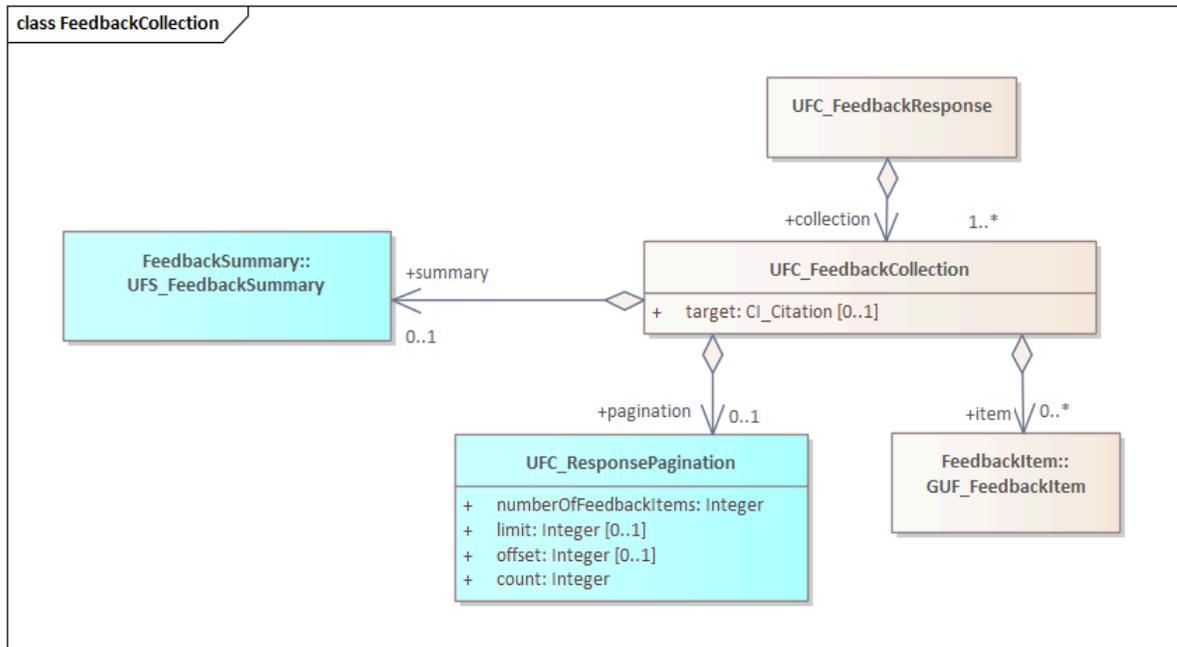


Figure 7 – User Feedback Collection Extension classes in a UML diagram

### REQUIREMENT 6

IDENTIFIER /req/feedback-collection/response

A The implementations of a feedback response SHALL follow the UML model as shown in Figure 7 with the properties specified in Table 30.

Table 30 – UFC\_FeedbackResponse data type

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
collection	Collection of feedback items	UFC_FeedbackCollection data type (see Table 31)	One or more (mandatory)

### REQUIREMENT 7

IDENTIFIER /req/feedback-collection/collection

## REQUIREMENT 7

- A The implementations of a feedback collection SHALL follow the UML model as shown in Figure 7 with the properties specified in Table 31.

**Table 31 – UFC\_FeedbackCollection data type**

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
target	Common geospatial resource to which the collection refers.	ISO 19115-1 CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or one (optional). If the target of the citation is specified by another part of the data model this parameter should not be used
item	Feedback item	GUF_FeedbackItem data type (see Table 7)	Zero or more (optional)
summary	Summary of the feedback items	UFS_FeedbackSummary data type (see Table 23)	Zero or one (optional)
pagination	Information about the page structure of the collection	UFC_ResponsePagination (see Table 32)	Zero or one (optional)

## REQUIREMENT 8

**IDENTIFIER** /req/feedback-collection/pagination

- A The implementations of a response pagination SHALL follow the UML model as shown in Figure 7 with the properties specified in Table 32.

**Table 32 – UFC\_ResponsePagination data type**

NAMES	DEFINITION	DATA TYPE AND VALUES	MULTIPLICITY AND USE
numberOfFeedbackItems	Number of feedback items in the collection	Integer data type	One (mandatory)
limit	Maximum feedback items per page	Integer data type	Zero or one (optional). It not present, there is no limit
offset	Number of the first items in the complete collection that has been skipped	Integer data type	Zero or one (optional). It not present, no item was skipped
count	Number of feedback items in this page	Integer data type	One (mandatory)

A

# ANNEX A (NORMATIVE) ABSTRACT TEST SUITE (NORMATIVE)

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# ANNEX A (NORMATIVE) ABSTRACT TEST SUITE (NORMATIVE)

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## A.1. Introduction

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A conformant implementation of this Standard must satisfy the following system characteristics.

## A.2. Conformance class: Quality Common

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CONFORMANCE CLASS A.1	
IDENTIFIER	<a href="http://www.opengis.net/spec/guf-conceptual/2.0/conf/quality-common">http://www.opengis.net/spec/guf-conceptual/2.0/conf/quality-common</a>
SUBJECT	Conformance Class "Quality Common"
REQUIREMENTS CLASS	Requirements class 1: <a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common">https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common</a>
TARGET TYPE	Web API
CONFORMANCE TESTS	Abstract test A.1: <a href="/conf/quality-common/citation-of-publications">/conf/quality-common/citation-of-publications</a> Abstract test A.2: <a href="/conf/quality-common/discovered-issue">/conf/quality-common/discovered-issue</a> Abstract test A.3: <a href="/conf/quality-common/reproducible-usage">/conf/quality-common/reproducible-usage</a>

### A.2.1. Publications

ABSTRACT TEST A.1	
IDENTIFIER	<a href="/conf/quality-common/citation-of-publications">/conf/quality-common/citation-of-publications</a>

## ABSTRACT TEST A.1

REQUIREMENT	Requirement 1: /req/quality-common/citation-of-publications
INDIRECT PREREQUISITE	Requirements class 1: <a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common">https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common</a>
TEST PURPOSE	The implementations of quality common <i>shall</i> follow the UML model as shown in Figure 1. This model extends ISO 19115-1:2014 CI_Citation with elements for publications and the specification of the purpose of a citation by adding the properties specified in Table 2, Table 3 and Table 4.
DESCRIPTION	Validate the requirements of publication citations.
STEP	Test passes if publication citations instances are conformant to ISO 19115-1:2014 CI_Citation and point to the QCM_Publication data type and follow the data model specified in Table 2, Table 3 and Table 4.

## A.2.2. Discovered Issues

### ABSTRACT TEST A.2

IDENTIFIER	/conf/quality-common/discovered-issue
REQUIREMENT	Requirement 2: /req/quality-common/discovered-issue
DESCRIPTION	<p>test-purpose</p> <p>The class QCM_DiscoveredIssue that follows the UML model in Figure 2 with the properties specified in Table 5 shall be used when describing discovered issues in geospatial resources.</p> <p>Validate the requirements of discovered issues.</p>
STEP	Test passes if discovered issues instances point to the QCM_DiscoveredIssue data type and follow the data model specified in Table 5.

## A.2.3. Reproducible Usage

### ABSTRACT TEST A.3

**IDENTIFIER** /conf/quality-common/reproducible-usage

**REQUIREMENT** Requirement 3: /req/quality-common/reproducible-usage

**TEST PURPOSE** The class QCM\_ReproducibleUsage that follows the UML model in Figure 3 with the properties specified in Table 6 shall be used when describing reproducible usage in geospatial resources.

**DESCRIPTION** Validate the requirements of reproducible usage.

**STEP** Test passes if reproducible usage instances point to the QCM\_ReproducibleUsage data type and follow the data model specified in Table 6.

## A.3. Conformance class: User Feedback-item

### CONFORMANCE CLASS A.2

**IDENTIFIER** <http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-item>

**SUBJECT** Conformance Class “User Feedback-item”

**REQUIREMENTS CLASS** Requirements class 2: <https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-item>

**TARGET TYPE** Web API

**CONFORMANCE TEST** Abstract test A.4: /conf/feedback-item/item

### A.3.1. Feedback Item

#### ABSTRACT TEST A.4

**IDENTIFIER** /conf/feedback-item/item

## ABSTRACT TEST A.4

REQUIREMENT Requirement 4: /req/feedback-item/item

### DESCRIPTION

test-purpose

indirect-dependency

The class GUF\_FeedbackItem that follows the UML model in Figure 4 and Figure 5 with the properties specified in Table 7, and other tables referenced in Table 7, shall be used when describing feedback items relating to geospatial resources. <https://www.opengis.>

## ABSTRACT TEST A.4

		<a href="#">net/spec/guf-conceptual/2.0/req/quality-common</a>
	Validate the requirements of feedback items	
STEP	Test passes if feedback item instances point to the GUF_FeedbackItem data type and follow the data model specified in Table 7 and its dependencies.	

## A.4. Conformance class: Feedback-summary

### CONFORMANCE CLASS A.3

IDENTIFIER	<a href="http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-summary">http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-summary</a>
SUBJECT	Conformance Class "Feedback summary"
REQUIREMENTS CLASS	Requirements class 3: <a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary">https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary</a>
TARGET TYPE	Web API
CONFORMANCE TEST	Abstract test A.5: <a href="#">/conf/feedback-summary/summary-model</a>

### A.4.1. Feedback Summary

#### ABSTRACT TEST A.5

IDENTIFIER	<a href="#">/conf/feedback-summary/summary-model</a>
REQUIREMENT	Requirement 5: <a href="#">/req/feedback-summary/summary-model</a>

## ABSTRACT TEST A.5

<b>INDIRECT PREREQUISITE</b>	Requirements class 2: <a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-item">https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-item</a>
<b>TEST PURPOSE</b>	The class UFS_FeedbackSummary that follows the UML model in Figure 6 with the properties specified in Table 23 shall be used when a grouping of feedback items is needed.
<b>DESCRIPTION</b>	step Validate the requirements of feedback summary
	step Test passes if feedback summary instances point to the UFS_FeedbackSummary data type and follow the data model specified in Table 23 and its dependencies.

## A.5. Conformance class: Feedback-collection

### CONFORMANCE CLASS A.4

<b>IDENTIFIER</b>	<a href="http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-collection">http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-collection</a>
<b>SUBJECT</b>	Conformance Class "Feedback collection"
<b>REQUIREMENTS CLASS</b>	Requirements class 4: <a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-collection">https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-collection</a>
<b>TARGET TYPE</b>	Web API
<b>CONFORMANCE TEST</b>	Abstract test A.6: <a href="/conf/feedback-collection/response">/conf/feedback-collection/response</a>

### A.5.1. Feedback collection response

#### ABSTRACT TEST A.6

<b>IDENTIFIER</b>	<a href="/conf/feedback-collection/response">/conf/feedback-collection/response</a>
<b>REQUIREMENT</b>	Requirement 6: <a href="/req/feedback-collection/response">/req/feedback-collection/response</a>
<b>INDIRECT PREREQUISITE</b>	Requirements class 3: <a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary">https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary</a>

## ABSTRACT TEST A.6

TEST PURPOSE	The class UFC_FeedbackResponse that follows the UML model in Figure 7 with the properties specified in Table 30 shall be used when a grouping of feedback items is needed as a response to a feedback catalogue request.
DESCRIPTION	Validate the requirements of feedback collection responses
STEP	Test passes if feedback collection response instances point to the UFC_FeedbackResponse data type and follow the data model specified in Table 30 and its dependencies.

## A.5.2. Feedback collection

### ABSTRACT TEST A.7

IDENTIFIER /conf/feedback-collection/collection

REQUIREMENT Requirement 7: /req/feedback-collection/collection

DESCRIPTION test-purpose

The class UFC\_FeedbackCollection that follows the UML model in Figure 7 with the properties specified in Table 31 shall be used when a grouping of

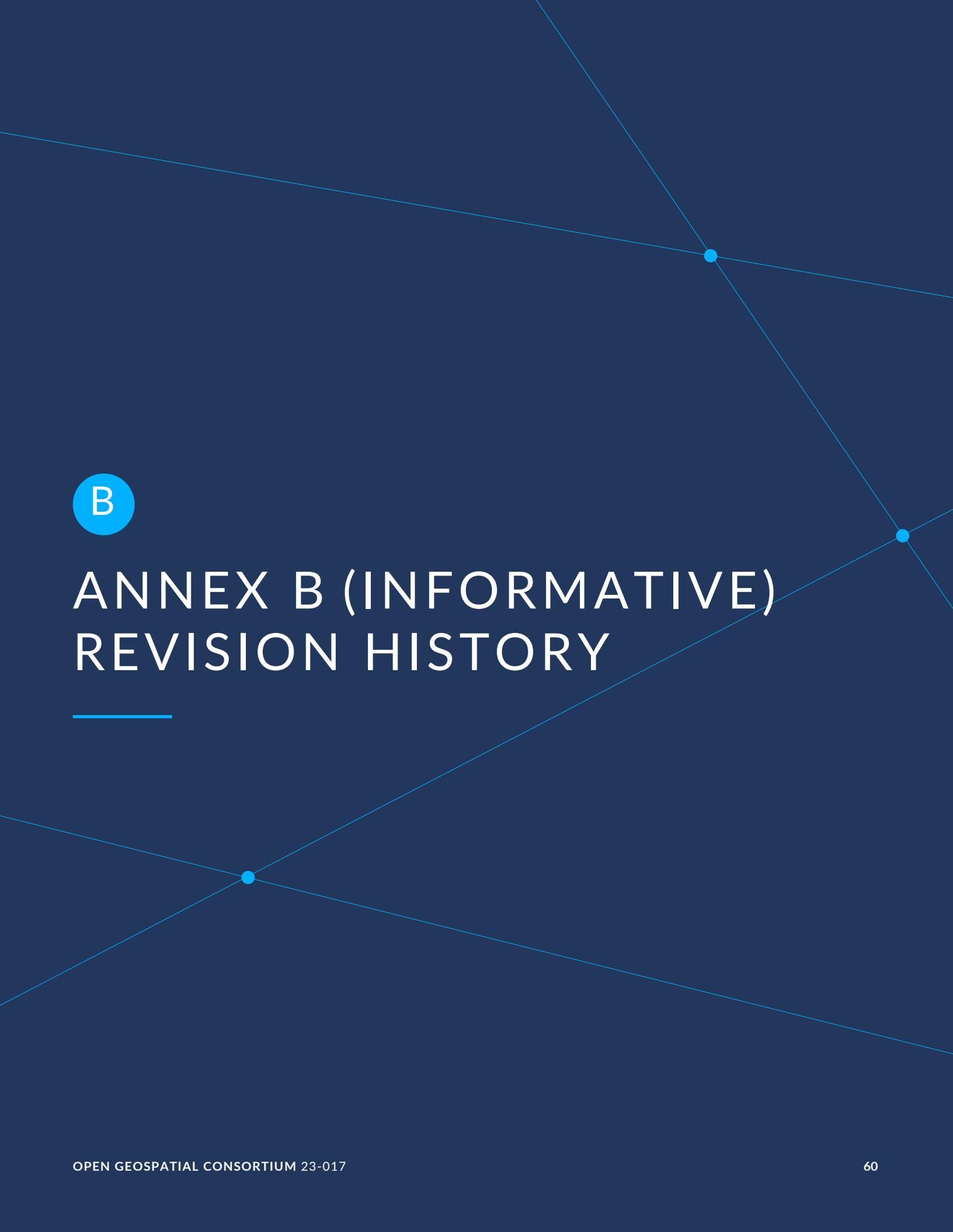
## ABSTRACT TEST A.7

	indirect-dependency	<a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary">feedback items is needed. https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary</a>
	Validate the requirements of feedback collections	
STEP	Test passes if feedback collection instances point to the UFC_FeedbackCollection data type and follow the data model specified in Table 31 and its dependencies.	

### A.5.3. Feedback collection response pagination

## ABSTRACT TEST A.8

IDENTIFIER	/conf/feedback-collection/pagination
REQUIREMENT	Requirement 8: /req/feedback-collection/pagination
INDIRECT PREREQUISITE	Requirements class 3: <a href="https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary">https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary</a>
TEST PURPOSE	The class UFC_ResponsePagination that follows the UML model in Figure 7 with the properties specified in Table 32 shall be used when pagination of a catalogue response is needed.
DESCRIPTION	Validate the requirements of feedback collection responses with pagination.
STEP	Test passes if feedback collection response instances that were requested with a pagination mechanism point to the UFC_ResponsePagination data type and follow the data model specified in Table 32.



B

# ANNEX B (INFORMATIVE) REVISION HISTORY

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# B

## ANNEX B (INFORMATIVE) REVISION HISTORY

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**Table B.1** – Revision History

DATE	RELEASE	AUTHOR	PARAGRAPH MODIFIED	DESCRIPTION
2023-06-07	0.1	Alaitz Zabala	All	GUF conceptual model v.1.0 transcribed to metanorma
2023-12-04	0.2	Alaitz Zabala	All	First version of GUF conceptual model 2.0
2024-05-23	0.3	Alaitz Zabala & Oscar González	all	Reviewed version to present to OGC GUF SWG
2024-11-27	0.4	Carl Reed	All	text minor revisions



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## BIBLIOGRAPHY

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