Open
Geospatial
Consortium

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

## STANDARD
## Conceptual model

## DRAFT

# CONTENTS

# LIST OF TABLES

# LIST OF FIGURES

# LIST OF RECOMMENDATIONS

# I  ABSTRACT

This standard defines the version 2.0 of the conceptual Geospatial User Feedback (GUF) data model (v.1.0 is included in OGC 15-097r1). Geospatial User Feedback 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 certain resource.

This 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 developing ISO metadata models.

This standard is designed to be used combination with an encoding standard. An XML encoding for this version 2.0 of the conceptual model following the ISO19139 encoding rules is specified in a separate OGC standard (OGC 23-061). In the near future a JSON encoding will be also developed.

# II  KEYWORDS

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

ogcdoc, OGC document, API, openapi, html

# III  PREFACE

**NOTE:** 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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. The Open Geospatial Consortium shall not be held responsible for identifying any or all such patent rights.

*Recipients of this document are requested to submit, with their comments, notification of any relevant patent claims or other intellectual property rights of which they may be aware that might be infringed by any implementation of the standard set forth in this document, and to provide supporting documentation.*

# IV  SECURITY CONSIDERATIONS

No security considerations have been made for this document.

## V SUBMITTING ORGANIZATIONS

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

- UAB-CREAF

## VI SUBMITTERS

All questions regarding this submission should be directed to the editor or the submitters:

**Table** — Submitters

| Name | Affiliation |
|------|-------------|
| Joan Masó | UAB-CREAF |
| Alaitz Zabala | UAB-CREAF |
| Oscar González | UAB-CREAF |
| Lucy Bastin | Aston University |

# 1

# SCOPE

---

# 1 SCOPE

**NOTE:** This OGC™ Standard defines a data model for encoding user feedback about geospatial datasets or metadata records describing datasets. It reuses and extends the v.1.0 of the GUF conceptual model (OGC 15-097r1) as well as 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 allow 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 allows 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, 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

# 2 CONFORMANCE

This standard defines 4 conformance classes.

Requirements for standardization targets are considered:

- Requirement 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 conformance class targets clients and services implementing quality or user feedback models.

- Requirement 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 conformance class targets clients and services implementing user feedback models.

- Requirement 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 conformance class targets clients and services implementing user feedback models.

- Requirement 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 conformance 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[1].

In order to conform to this OGC™ interface standard, a software implementation shall choose to implement:

a) Any encoding extension associated to this standard. Initially an XML encoding following the ISO19139 encoding rules will also be provided in a separated standard document (OGC 23-061).

b) A JSON encoding will be also provided in a separated standard document.

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

---

[1]www.opengeospatial.org/cite

# 3

# NORMATIVE REFERENCES

# 3 NORMATIVE REFERENCES

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.

Joan Masó and Lucy Bastin: OGC 15-097r1, *OGC® Geospatial User Feedback Standard: Conceptual Model*. Open Geospatial Consortium (2016). http://www.opengis.net/doc/IS/guf-conceptual/1.0.0.

Arliss Whiteside Jim Greenwood: OGC 06-121r9, *OGC Web Service Common Implementation Specification*. Open Geospatial Consortium (2010).

Policy SWG: OGC 08-131r3, *The Specification Model — Standard for Modular specifications*. Open Geospatial Consortium (2009).

# 4

# TERMS AND DEFINITIONS

---

# 4 TERMS AND DEFINITIONS

No terms and definitions are listed in this document.

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 15-098r1:2016 [2].

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 (ISO 24619:2011 [2], 3.1.16)

**4.2**
**item**
anything that can be described and considered separately (ISO 19157:2013 [3], 4.18)

**4.3**
**metadata**
information about a resource (ISO 19115-1:2014 [4], 4.10)

**4.4**
**quality**
degree to which a set of inherent characteristics fulfils requirements (ISO 9000:2005 [5], 3.1.1)

**4.5**
**rating**
component of a user feedback item that subjectively classifies a resource in a short list of ordered categories (OGC 15-097r1:2016 [7], 4.5) 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.

**4.6**
**user**
consumer of a resource (OGC 15-097r1:2016 [7], 4.6)

**4.7**
**user comment**
component of a user feedback item providing textual information with no structure (OGC 15-098r1:2016 [7], 4.7)

**4.8**
**user feedback**
information about a resource directly provided by users (OGC 15-097r1:2016 [7], 4.8)

**4.9**
**user feedback item**

unit of information provided by a user about related resources as a result of its usage (OGC 15-097r1:2016 [7], 4.9)

**4.10**
**user feedback collection** collection of feedback items that are grouped by criteria, or are the result of a query (OGC 15-097r1:2016 [7], 4.10)

**4.11**
**user feedback summary**
statistical summary of a feedback collection (OGC 15-097r1:2016 [7], 4.11)

**5**

# CONVENTIONS

# 5 CONVENTIONS

## 5.1. Data dictionary tables

The data dictionary for this standard 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) | The name is the UML model attribute or association role name.<br>The name capitalization rules used are specified in Subclause 11.6.2 of OGC 06-121r9 [1]. Some names in the tables may appear to contain spaces, but no names contain spaces. |
| Definition (second column) | Specifies the definition of this parameter (omitting unnecessary words such as "a", "the", and "is"). If the parameter value is the identifier of something, not a description or definition, the definition of this parameter should read something like "Identifier of …". |
| Data type and value (third column) or Data type (if no second items are included in rows of table) | Normally contains two items:<br>The first item is often the data type used for this parameter, using data types appropriate in a UML model, in which this parameter 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).<br>The optional second item in the third column of each table should indicate the source of values for this parameter, the alternative values, or other value information, unless the values are quite clear from other listed information. |
| Multiplicity and use (right or fourth column) or Multiplicity (if are no second items are included in rows of table) | Normally contains two items:<br>The first item specifies the multiplicity and optionality of this parameter in this data structure, either "One (mandatory)", "One or more (mandatory)", "Zero or one (optional)", or "Zero or more (optional)".<br>The second item in the right column of each table specify how any multiplicity other than "One (mandatory)" is used. If that parameter is optional, under what condition(s) shall that parameter be included or not included? If that parameter can be repeated, for what is that parameter repeated? |

When the data type used in the third column of such a table, is an enumeration or code list in which all the values are listed, together with the meaning of each value. When this information is extensive, these values and meanings are specified in a separate table that is referenced in the third column of the table row.

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

The contents 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 us 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].

- 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.

- 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

The Geospatial User Feedback standard follows the modular specification design pattern as described in OGC 08-131r3 [6]. The contributors to this 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 potentially provide specific encodings of the data model provided in this document. For example, the OGC 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

In addition to metadata provided by the original data provider describing geospatial resources, many users report that they come to 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, the MD_Usage class is a small 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.

The GUF model makes an effort to remain as simple as possible but comprehensive enough, in order to allow for simple user interfaces that can cover different levels of expertise on geospatial data usage. The 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). Each one of the previous examples is considered an "item" of feedback as in the first version of the GUF conceptual model [7]. Feedback items can be arranged in collections and a summary description of the collection is also modeled. Geospatial User Feedback can be provided both about data or metadata.

## 5.5. Quality Common

This standard reuses elements of the geospatial metadata work and standard defined and maintained by ISO TC 211. 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 | |
|---|---|
| **IDENTIFIER** | `https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common` |
| **TARGET TYPE** | Quality Common |
| **CONFORMANCE CLASS** | Conformance class A.1: `http://www.opengis.net/spec/guf-conceptual/2.0/conf/quality-common` |
| **PREREQUISITE** | ISO19115-1:2014 and ISO19157:2013 data models |
| **NORMATIVE STATEMENTS** | Requirement 1: `/req/quality-common/citation-of-publications`<br>Requirement 2: `/req/quality-common/discovered-issue`<br>Requirement 3: `/req/quality-common/reproducible-usage` |

This 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 conformance class. In essence, this conformance class represents the foundations for building a user feedback model.

This requirements class inherits 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, we extend this class to make it more suitable for citing publications.

| REQUIREMENT 1 | |
|---|---|
| **IDENTIFIER** | `/req/quality-common/citation-of-publications` |

## REQUIREMENT 1

| INCLUDED IN | Requirements class 1: `https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common` |
|---|---|
| A | 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. [1] <br><br> [1] This model extends ISO 19115-1:2014 CI_Citation with elements for publications. |
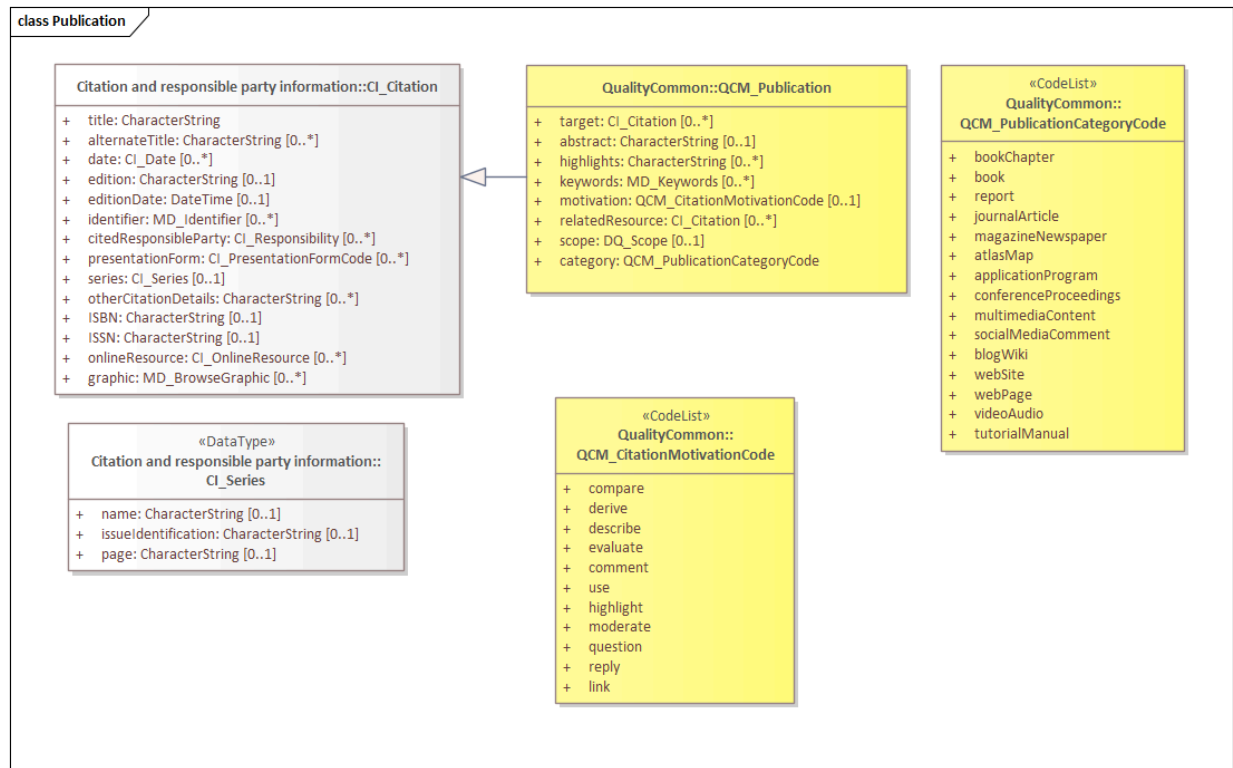


**Figure 1** — QCM_Publication in UML

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) |

| NAMES | DEFINITION | DATA TYPES AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| 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) |
| 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 [a] | Character String type, not empty | Zero or one (optional) |
| highlights | Highlights of the publication | Character String type, not empty | Zero or more (optional) |

| NAMES | DEFINITION | DATA TYPES AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| 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 provided in relation to the parent class or the target. | QCM_CitationMotivationCode type. See Table 3 | Zero or one (optional) |
| 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) |

[a] 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) |

| NAME | DEFINITION |
|------|------------|
| reply | Contains a reply/answer to a previous publication. It can be a publication that responds 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

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` |
| **INCLUDED IN** | Requirements class 1: `https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common` |
| **A** | The implementations of a discovered issue SHALL follow the UML model as shown in Figure 2 with the properties specified in Table 5. |
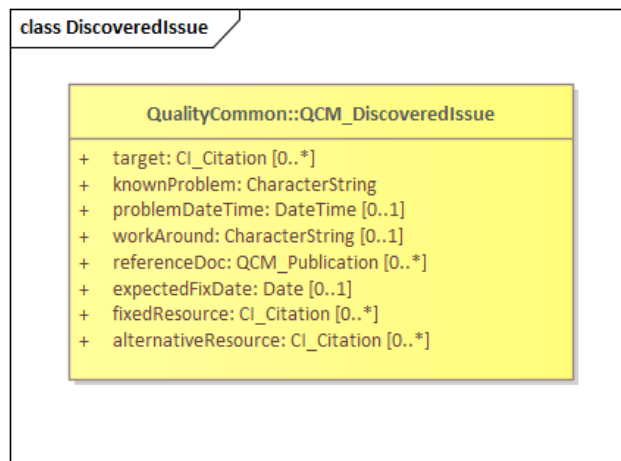


**Figure 2** — QCM_DiscoveredIssue in UML

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 |
| knownProblem | Known issue with the target | Character String type, not empty | One (mandatory) |

| NAMES | DEFINITION | DATA TYPES AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| 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 Table 2) | 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 the geospatial resource. In MD_Usage, the specificUsage is a string. The second version of the GUF conceptual model standards 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 |
| INCLUDED IN | Requirements class 1: https://www.opengis.net/spec/guf-conceptual/2.0/req/ quality-common |
| A | The implementations of a reproducible usage SHALL follow the UML model as shown in Figure 3 with the properties specified in Table 6. [1]<br><br>[1] This model extends ISO 19115-1:2014 MD_Usage with elements for reproducible usage. |
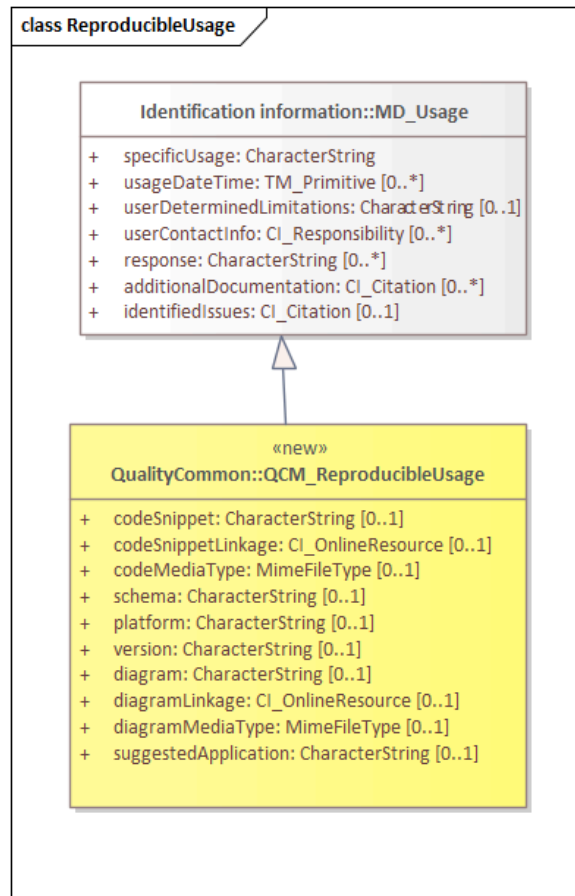
**Figure 3** — QCM_ReproducibleUsage in UML

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) |

| NAMES | DEFINITION | DATA TYPES AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| 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 [a] | Character String type, not empty | Zero or one (optional) |
| diagramLinkage | URL Link of the descriptive diagram of this reproducible usage [a] | 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) |

[a] Usually a single diagram description is provided (text or URL)

# 7

# REQUIREMENTS CLASS "USER FEEDBACK ITEM"

# 7 REQUIREMENTS CLASS "USER FEEDBACK ITEM"

## 7.1. Overview

This 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 | |
|---|---|
| **IDENTIFIER** | `https://www.opengis.net/spec/guf-conceptual/2.0/req/user-feedback-item` |
| **TARGET TYPE** | User Feedback Item |
| **CONFORMANCE CLASS** | Conformance class A.2: `http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-item` |
| **PREREQUISITE** | /req/quality-common |
| **NORMATIVE STATEMENT** | Requirement 2-1: `/req/user-feedback-item/feedback-item` |

## 7.2. Feedback Item



**Figure 4** — GUF_FeedbackItem (fragment), GUF_UserInformation and GUF_FeedbackTarget in UML

class FeedbackItem

**GUF_FeedbackItem**
+ itemIdentifier: MD_Identifier
+ abstract: CharacterString
+ purpose: CharacterString [0..1]
+ contactRole: GUF_UserRoleCode
+ dateInfo: CI_Date [1..*]
+ itemIsReplyTo: MD_Identifier [0..*]
+ descriptiveKeywords: MD_Keywords [0..*]
+ tag: CharacterString [0..*]
+ locale: PT_Locale [0..*]
+ externalFeedback: CI_Citation [0..*]

*constraints*
{count(target.type="primary")>0}

CharMe ideas

**Lineage information::LI_Lineage**
+ statement: CharacterString [0..1]
+ scope: MD_Scope [0..1]
+ additionalDocumentation: CI_Citation [0..*]

+additionalLineageSteps 0..1

this includes describing sources, processes and algorithms (ISO 19115-2)

«CodeList»
**GUF_SignificantEventTypeCode**
+ hurricaneNatural
+ volcanicEruptionNatural
+ elNinoNatural
+ droughtNatural
+ stormNatural
+ wildfireNatural
+ floodNatural
+ earthquakeNatural
+ tsunamiNatural
+ ifsEvent
+ systemEvent
+ satelliteAnomaly
+ dropsondeAnomaly
+ aircraftAnomaly
+ buoyAnomaly
+ shipAnomaly
+ landStationAnomaly
+ mobileSensorAnomaly
+ sensorAlarm

+significantEvent 0..*
**GUF_SignificantEvent**
+ abstract: CharacterString
+ citation: CI_Citation [0..*]
+ extent: EX_Extent
+ eventType: GUF_SignificantEventTypeCode [0..1]

**QualityCommon::QCM_DiscoveredIssue**
+ target: CI_Citation [0..*]
+ knownProblem: CharacterString
+ problemDateTime: DateTime [0..1]
+ workAround: CharacterString [0..1]
+ referenceDoc: QCM_Publication [0..*]
+ expectedFixDate: Date [0..1]
+ fixedResource: CI_Citation [0..*]
+ alternativeResource: CI_Citation [0..*]

+additionalQuality 0..*
**Data quality:: DQ_DataQuality**

«CodeList»
**GUF_RatingCode**
+ 1
+ 2
+ 3
+ 4
+ 5

The way codelist are implemented in ISO, they are left completely open. [1,2,3,4,5] could be more appropriate for datasets or metadata and [positive, negative, neutral] could be useful for comments and [thumbs-up, thumbs-down] for questions and answers.

+rating 0..1
**GUF_Rating**
+ rating: GUF_RatingCode

+userComment 0..1
**GUF_UserComment**
+ comment: CharacterString
+ motivation: GUF_MotivationCode [0..1]

**Identification information::MD_Usage**
+ specificUsage: CharacterString
+ usageDateTime: TM_Primitive [0..*]
+ userDeterminedLimitations: CharacterString [0..1]
+ userContactInfo: CI_Responsibility [0..*]
+ response: CharacterString [0..*]
+ additionalDocumentation: CI_Citation [0..*]
+ identifiedIssues: CI_Citation [0..1]

«CodeList»
**GUF_MotivationCode**
+ comment
+ question
+ answer
+ response
+ justification
+ resolution
+ conclusion
+ moderation
+ annotation
+ acceptedAnswer

«CodeList»
**GUF_ReportAspectCode**
+ usage
+ fitnessForPurpose
+ limitation
+ alternative
+ problem

+usage 0..*
**GUF_UsageReport**
+ reportAspect: GUF_ReportAspectCode
+ discoveredIssue: QCM_DiscoveredIssue [0..*]

+usageDescription 0..*

«new»
**QualityCommon::QCM_ReproducibleUsage**
+ codeSnippet: CharacterString [0..1]
+ codeSnippetLinkage: CI_OnlineResource [0..1]
+ codeMediaType: MimeFileType [0..1]
+ schema: CharacterString [0..1]
+ platform: CharacterString [0..1]
+ version: CharacterString [0..1]
+ diagram: CharacterString [0..1]
+ diagramLinkage: CI_OnlineResource [0..1]
+ diagramMediaType: MimeFileType [0..1]
+ suggestedApplication: CharacterString [0..1]

**Citation and responsible party information::CI_Citation**
+ title: CharacterString
+ alternateTitle: CharacterString [0..*]
+ date: CI_Date [0..*]
+ edition: CharacterString [0..1]
+ editionDate: DateTime [0..1]
+ identifier: MD_Identifier [0..*]
+ citedResponsibleParty: CI_Responsibility [0..*]
+ presentationForm: CI_PresentationFormCode [0..*]
+ series: CI_Series [0..1]
+ otherCitationDetails: CharacterString [0..*]
+ ISBN: CharacterString [0..1]
+ ISSN: CharacterString [0..1]
+ onlineResource: CI_OnlineResource [0..*]
+ graphic: MD_BrowseGraphic [0..*]

+citation 0..*

**QualityCommon::QCM_Publication**
+ target: CI_Citation [0..*]
+ abstract: CharacterString [0..1]
+ highlights: CharacterString [0..*]
+ keywords: MD_Keywords [0..*]
+ motivation: QCM_CitationMotivationCode [0..1]
+ relatedResource: CI_Citation [0..*]
+ scope: DQ_Scope [0..1]
+ category: QCM_PublicationCategoryCode

**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 (see 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 [a]. | 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) |
| itemIsReplyTo | 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) [b] |
| additionalQuality | Structured quality assessment result | DQ_DataQuality data type (ISO 19157:2013 C.2.1.1) | Zero or more (optional) [b] |
| userComment | Text free user comment | GUF_UserComment data type (see Table 13) | Zero or one (optional) [b] |

| NAME | DEFINITION | DATA TYPE AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| usage | Structured usage report | GUF_UsageReport (see Table 15) | Zero or more (optional) [b] |
| rating | Rating code reflecting the satisfaction of the user with the resource used | GUF_Rating (see Table 17) | Zero or one (optional) [b] |
| 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) [b] |
| 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) [b] |
| 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) [b] |
| 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) |

[a] The idea is for a single user to be able to embody more than one role, but only one 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.

[b] 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 [a] | Reference to a resource (e.g. a dataset or metadata record) that is target of the feedback item or a superset of it [b] | CI_Citation data type (ISO 19115-1:2014 B.3.2.1) | One or more (mandatory) [c] |
| metadataIdentifier [f] | 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 subsets of a dataset or resource. | MD_scope data type (ISO 19115-1:2014 B.3.3.1) | Zero or one (optional) [b] |
| role | The role of the target with respect to the feedback item [g] | GUF_TargetRoleCode code (see Table 12) | One (mandatory) |
| parent | Parent of the cited resource [d] | GUF_FeedbackTarget data type (see this table) | Zero or one (optional) |
| child | Child of the cited resource [e] | GUF_FeedbackTarget data type (see this table) | Zero or more (optional) |

[a] Do not confuse this data type with itemIsReplyTo in GUF_FeedbackItem. In the case where a feedback item replies to another feedback item, this is indicated in itemIsReplyTo. It is expected that the targets of both items are identical including the same resourceRef.

[b] If the reference cites a superset of the feedback target, use 'scope' to define the right subset of the resource referenced.

[c] If more than one is provided they shall point to the same resource. If you have more than one resource, use more than one GUF_FeedbackTarget elements.

[d] 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.

[e] If the target is a collection, this can be used to mention its members.

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

[g] 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 itemIsReplyTo 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 itemIsReplyTo 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 itemIsReplyTo 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 itemIsReplyTo 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 a 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_Thumbs Code (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 a event identifier) | CI_Citation data type (ISO 19115-1:2014 B.3.2.1) | Zero or more (optional) |
| extent | Spatio-temporal 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 a 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) |
| sensorAlarm | Abnormal acquisition above or below normal parameters. |

NOTE:   This codelist is based on the CHARMe project, which focused primarily on hazards and climatic analysis. (https://software.ecmwf.int/wiki/display/CHAR/Significant+Events). 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. E.g. this 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, e.g. to rate the comment of another user about a target resource. E.g. 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 "USER FEEDBACK SUMMARY EXTENSION"

# 8  REQUIREMENTS CLASS "USER FEEDBACK SUMMARY EXTENSION"

## 8.1. Overview

This requirements class defines the data model classes that allow for encoding summary statistics of feedback items that share the same target.

| REQUIREMENTS CLASS 3 | |
|---|---|
| **IDENTIFIER** | `https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary` |
| **TARGET TYPE** | Feedback Summary |
| **CONFORMANCE CLASS** | Conformance class A.3: `http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-summary` |
| **PREREQUISITE** | /req/feedback-item |
| **NORMATIVE STATEMENT** | Requirement 3-1: `/req/feedback-summary/summary-model` |

## 8.2. Feedback Summary
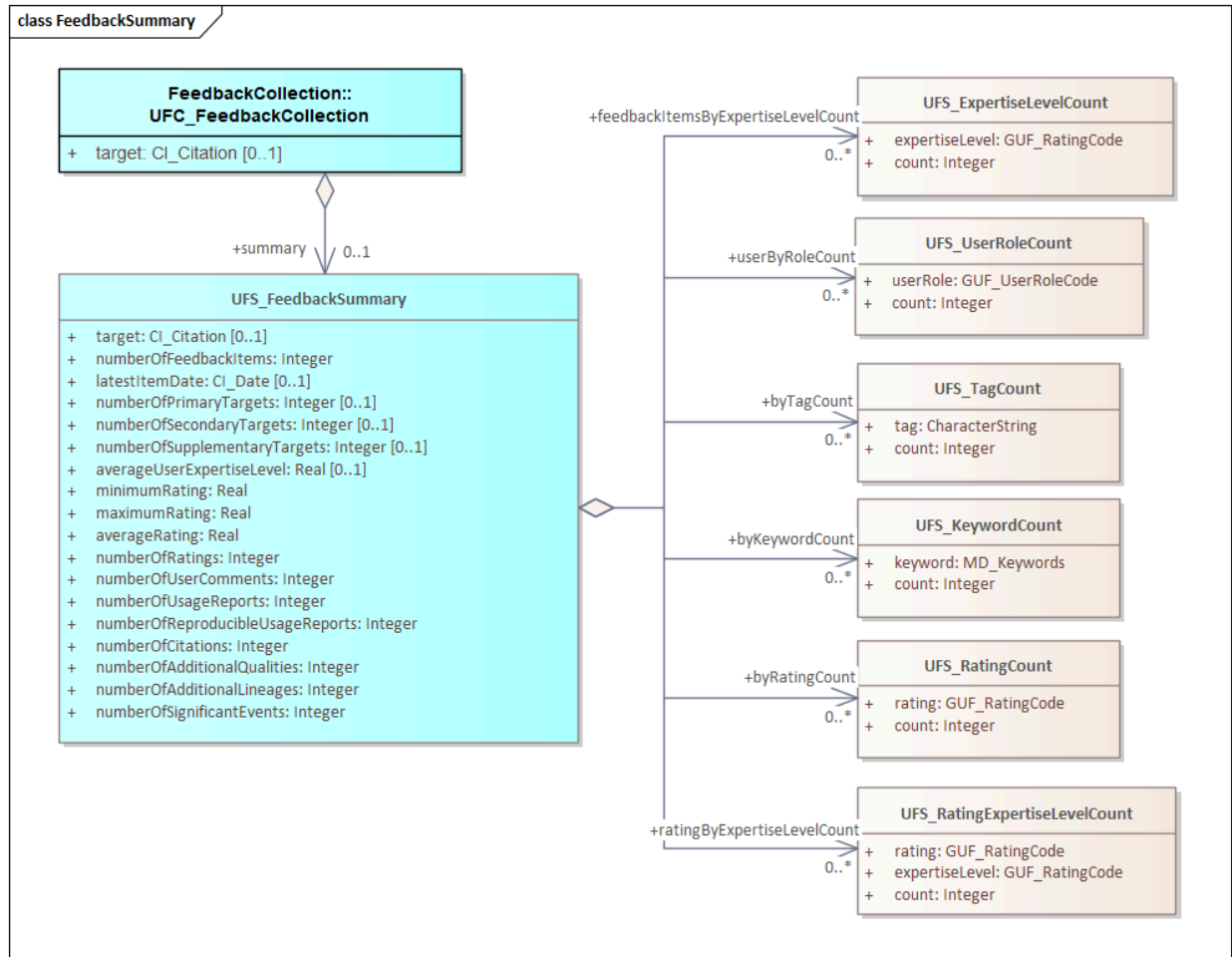


**Figure 6** — UFS_FeedbackSummary data model UML diagram

**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 | Integer type | One (mandatory) |

| NAMES | DEFINITION | DATA TYPE AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| | this summary is about | | |
| latestItemDate | The date of the last item | CI_Date (ISO 19115-1:2014 B.3.2.6) | Zero or one (optional) |
| 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) |

| NAMES | DEFINITION | DATA TYPE AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| numberOfAdditionalLineages | Number of feedback items with a valid reported lineage | Integer type | One (mandatory) |
| numberOfSignificantEvents | Number of populated significant events | Integer type | One (mandatory) |
| feedbackItemsByExpertiseLevelCount | 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_RatingExpertiseLevelCount data type (see Table 29) | Zero or more (optional) [f] |

[a] In the case where feedbackItemsByExpertiseLevelCount occurs more than once, the expertiseLevel values shall be different for each.

[b] In the case where userByRoleCount occurs more than once, its userRole values shall be different.

[c] In the case where byTagCount occurs more than once, its tag values shall be different.

[d] In the case where byKeywordCount occurs more than once, its keyword values shall be different.

[e] In the case where byRatingCount occurs more than once, its rating values shall be different.

[f] 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 expertise level | 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 expertise level | 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 expertise level | 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 expertise level | GUF_RatingCode (see Table 20), GUF_ThumbsCode (see Table 21), GUF_SignCode (see Table 22) or other numerical code for rating | One (mandatory) |

| NAMES | DEFINITION | DATA TYPE AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| 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 "USER FEEDBACK COLLECTION EXTENSION"

# 9 REQUIREMENTS CLASS "USER FEEDBACK COLLECTION EXTENSION"

## 9.1. Overview

This requirements class defines the data model classes that allow for 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 | |
|---|---|
| **IDENTIFIER** | https://www.opengis.net/spec/guf-conceptual/2.0/req/user-feedback-collection |
| **TARGET TYPE** | User Feedback Collection |
| **CONFORMANCE CLASS** | Conformance class A.4: http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-collection |
| **PREREQUISITE** | /req/feedback-summary/ |
| **NORMATIVE STATEMENTS** | Requirement 4-1: /req/feedback-collection/response<br>Requirement 4-2: /req/feedback-collection/collection<br>Requirement 4-3: /req/feedback-collection/pagination |

## 9.2. Feedback Collection
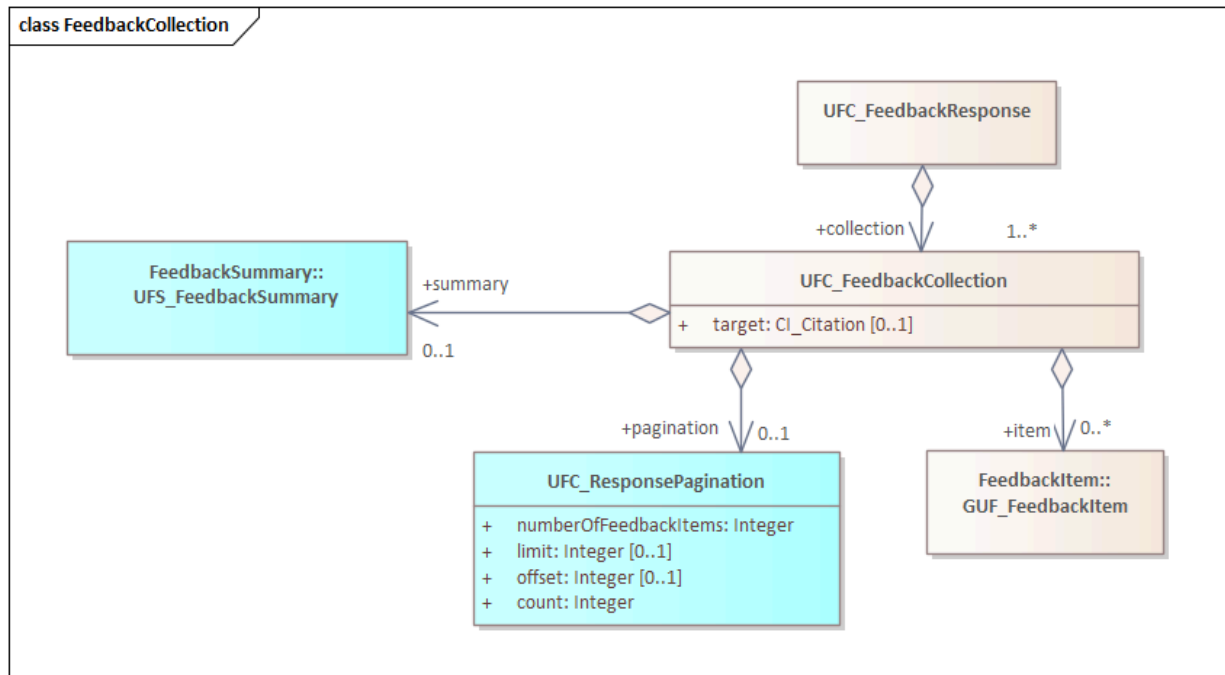


**Figure 7** — User Feedback Collection Extension classes in a UML diagram

**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) |

**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) |

| NAMES | DEFINITION | DATA TYPE AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| pagination | Information about the page structure of the collection | UFC_ResponsePagination (see Table 32) | Zero or one (optional) |

Table 32 — UFC_ResponsePagination data type

| NAMES | DEFINITION | DATA TYPE AND VALUES | MULTIPLICITY AND USE |
|---|---|---|---|
| numberOfFeedback Items | 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) CONFORMANCE CLASS ABSTRACT TEST SUITE (NORMATIVE)

# A

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

## A.1. Introduction

A GUF implementation of this standard must satisfy the following system characteristics to be conformant with this specification.

## A.2. Conformance class: Quality Common

| CONFORMANCE CLASS A.1 | |
|---|---|
| IDENTIFIER | `http://www.opengis.net/spec/guf-conceptual/2.0/conf/quality-common` |
| REQUIREMENTS CLASS | Requirements class 1: `https://www.opengis.net/spec/guf-conceptual/2.0/req/quality-common` |

### A.2.1. Publications

| ABSTRACT TEST A.1 | |
|---|---|
| IDENTIFIER | `/conf/quality-common/citation-of-publications` |
| REQUIREMENT | Requirement 1: `/req/quality-common/citation-of-publications` |
| TEST PURPOSE | The implementations of quality common *shall* 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. |

| ABSTRACT TEST A.1 | |
| --- | --- |
| | Dependency: ISO19115-1:2014 and ISO19157:2013 data models |
| TEST METHOD | 1. Validate the requirements of publication citations. |
| | 2. 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-issues` | |
| REQUIREMENT | /req/quality-common/discovered-issues | |
| DESCRIPTION | test-purpose | 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. |

**Example:**

Validate the requirements of discovered issues.

Test passes if discovered issues instances point to the QCM_DiscoveredIssue data type and follow the data model specified in Table 5.

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

| CONFORMANCE CLASS A.2 | |
| --- | --- |
| IDENTIFIER | http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-item |

| CONFORMANCE CLASS A.2 | |
|---|---|
| REQUIREMENTS CLASS | Requirements class 2: `https://www.opengis.net/spec/guf-conceptual/2.0/req/user-feedback-item` |

## A.3.1. Feedback item

| ABSTRACT TEST A.3 | |
|---|---|
| IDENTIFIER | `/conf/feedback-item/item` |
| REQUIREMENT | /req/feedback-item/item |
| TEST PURPOSE | The class GUF_FeedbackItem that follows the UML model in Figure 3 and Figure 4 with the properties specified in Table 6, and other tables referenced in Table 6, shall be used when describing feedback items relating to geospatial resources.<br>Dependency: /req/quality-common |
| TEST METHOD | 1. Validate the requirements of feedback items<br><br>2. Test passes if feedback item instances point to the GUF_FeedbackItem data type and follow the data model specified in Table 6 and its dependencies. |

# A.4. Conformance class: Feedback-summary

| CONFORMANCE CLASS A.3 | |
|---|---|
| IDENTIFIER | `http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-summary` |
| REQUIREMENTS CLASS | Requirements class 3: `https://www.opengis.net/spec/guf-conceptual/2.0/req/feedback-summary` |

## A.4.1. Feedback summary

| ABSTRACT TEST A.4 | |
|---|---|
| IDENTIFIER | `/conf/feedback-summary/summary-model` |
| REQUIREMENT | Requirement 3-1: `/req/feedback-summary/summary-model` |

| ABSTRACT TEST A.4 | |
|---|---|
| **TEST PURPOSE** | The class UFS_FeedbackSummary that follows the UML model in Figure 5 with the properties specified in Table 21 shall be used when a grouping of feedback items is needed. Dependency: /req/feedback-item |
| **TEST METHOD** | 1. Validate the requirements of feedback summary<br><br>2. Test passes if feedback summary instances point to the UFS_FeedbackSummary data type and follow the data model specified in Table 21 and its dependencies. |

# A.5. Conformance class: Feedback-collection

| CONFORMANCE CLASS A.4 | |
|---|---|
| **IDENTIFIER** | `http://www.opengis.net/spec/guf-conceptual/2.0/conf/feedback-collection` |
| **REQUIREMENTS CLASS** | Requirements class 4: `https://www.opengis.net/spec/guf-conceptual/2.0/req/user-feedback-collection` |

## A.5.1. Feedback collection response

| ABSTRACT TEST A.5 | |
|---|---|
| **IDENTIFIER** | `/conf/feedback-collection/response` |
| **REQUIREMENT** | Requirement 4-1: `/req/feedback-collection/response` |
| **TEST PURPOSE** | The class UFC_FeedbackResponse that follows the UML model in Figure 6 with the properties specified in Table 28 shall be used when a grouping of feedback items is needed as a response to a feedback catalogue request. Dependencies: /req/feedback-summary/ |
| **DESCRIPTION** | **Example:**<br>Validate the requirements of feedback collection responses<br>Test passes if feedback collection response instances point to the UFC_FeedbackResponse data type and follow the data model specified in Table 28 and its dependencies. |

## A.5.2. Feedback collection

| ABSTRACT TEST A.6 | |
|---|---|
| **IDENTIFIER** | `/conf/feedback-collection/collection` |
| **REQUIREMENT** | Requirement 4-2: `/req/feedback-collection/collection` |
| **DESCRIPTION** | test-purpose — The class UFC_FeedbackCollection that follows the UML model in Figure 6 with the properties specified in Table 29 shall be used when a grouping of feedback items is needed. Dependencies: /req/feedback-summary/ <br><br> **Example:** <br> Validate the requirements of feedback collections <br> Test passes if feedback collection instances point to the UFC_FeedbackCollection data type and follow the data model specified in Table 29 and its dependencies. |

## A.5.3. Feedback collection response pagination

| ABSTRACT TEST A.7 | |
|---|---|
| **IDENTIFIER** | `/conf/feedback-collection/pagination` |
| **REQUIREMENT** | Requirement 4-3: `/req/feedback-collection/pagination` |
| **TEST PURPOSE** | The class UFC_ResponsePagination that follows the UML model in Figure 6 with the properties specified in Table 30 shall be used when pagination of a catalogue response is needed. Dependencies: /req/feedback-summary/ |
| **DESCRIPTION** | **Example:** <br> Validate the requirements of feedback collection responses with pagination. |

## ABSTRACT TEST A.7

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 30.

# B

# ANNEX B (INFORMATIVE) REVISION HISTORY

# B

## ANNEX B (INFORMATIVE) REVISION HISTORY

**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 |

# BIBLIOGRAPHY

# BIBLIOGRAPHY

[1] OGC 06-121r9, OGC Web Service Common Implementation Specification

[2] ISO 24619:2011, Language resource management — Persistent identification and sustainable access

[3] ISO 19157:2013, Geographic information — Data quality

[4] ISO 19115-1:2014, Geographic information — Metadata — Part 1: Fundamentals

[5] ISO 9000:2005, Quality management systems — Fundamentals and vocabulary

[6] OGC 08-131r3, OGC Specification Model –- A Standard for Modular Specification

[7] OGC 15-097r1, OGC Geospatial User Feedback Standard: Conceptual Model v.1.0

[8] OGC 23-061, OGC Geospatial User Feedback Standard: XML Implementation v.2.0