Open Geospatial Consortium

Submission Date: 2015-12-10

Approval Date: 2016-05-25

Publication Date: 2016-12-22

External identifier of this OGC® document: http://www.opengis.net/doc/IS/guf-conceptual/1.0

URL for this OGC® document: http://docs.opengeospatial.org/is/15-097r1/15-097r1.html

Internal reference number of this OGC® document: 15-097r1

Version: 1.0

Category: OGC® Implementation Standard

Editor: Joan Masó and Lucy Bastin

OGC Geospatial User Feedback Standard: Conceptual Model

Copyright notice

Copyright © 2016 Open Geospatial Consortium
To obtain additional rights of use, visit http://www.opengeospatial.org/legal/.

Warning

This document is an OGC Member approved international standard. This document is available on a royalty free, non-discriminatory basis. This formatted version is INFORMATIVE. The normative format is available at:

http://docs.opengeospatial.org/is/15-097r1/15-097r1.html

Recipients of this document are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Document type: OGC® Standard
Document subtype: Conceptual Model
Document stage: Approved
Document language: English

License Agreement

Permission is hereby granted by the Open Geospatial Consortium, ("Licensor"), free of charge and subject to the terms set forth below, to any person obtaining a copy of this Intellectual Property and any associated documentation, to deal in the Intellectual Property without restriction (except as set forth below), including without limitation the rights to implement, use, copy, modify, merge, publish, distribute, and/or sublicense copies of the Intellectual Property, and to permit persons to whom the Intellectual Property is furnished to do so, provided that all copyright notices on the intellectual property are retained intact and that each person to whom the Intellectual Property is furnished agrees to the terms of this Agreement.

If you modify the Intellectual Property, all copies of the modified Intellectual Property must include, in addition to the above copyright notice, a notice that the Intellectual Property includes modifications that have not been approved or adopted by LICENSOR.

THIS LICENSE IS A COPYRIGHT LICENSE ONLY, AND DOES NOT CONVEY ANY RIGHTS UNDER ANY PATENTS THAT MAY BE IN FORCE ANYWHERE IN THE WORLD.

THE INTELLECTUAL PROPERTY IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND NONINFRINGEMENT OF THIRD PARTY RIGHTS. THE COPYRIGHT HOLDER OR HOLDERS INCLUDED IN THIS NOTICE DO NOT WARRANT THAT THE FUNCTIONS CONTAINED IN THE INTELLECTUAL PROPERTY WILL MEET YOUR REQUIREMENTS OR THAT THE OPERATION OF THE INTELLECTUAL PROPERTY WILL BE UNINTERRUPTED OR ERROR FREE. ANY USE OF THE INTELLECTUAL PROPERTY SHALL BE MADE ENTIRELY AT THE USER'S OWN RISK. IN NO EVENT SHALL THE COPYRIGHT HOLDER OR ANY CONTRIBUTOR OF INTELLECTUAL PROPERTY RIGHTS TO THE INTELLECTUAL PROPERTY BE LIABLE FOR ANY CLAIM, OR ANY DIRECT, SPECIAL, INDIRECT OR CONSEQUENTIAL DAMAGES, OR ANY DAMAGES WHATSOEVER RESULTING FROM ANY ALLEGED INFRINGEMENT OR ANY LOSS OF USE, DATA OR PROFITS, WHETHER IN AN ACTION OF CONTRACT, NEGLIGENCE OR UNDER ANY OTHER LEGAL THEORY, ARISING OUT OF OR IN CONNECTION WITH THE IMPLEMENTATION, USE, COMMERCIALIZATION OR PERFORMANCE OF THIS INTELLECTUAL PROPERTY.

This license is effective until terminated. You may terminate it at any time by destroying the Intellectual Property together with all copies in any form. The license will also terminate if you fail to comply with any term or condition of this Agreement. Except as provided in the following sentence, no such termination of this license shall require the termination of any third party end-user sublicense to the Intellectual Property which is in force as of the date of notice of such termination. In addition, should the Intellectual Property, or the operation of the Intellectual Property, infringe, or in LICENSOR's sole opinion be likely to infringe, any patent, copyright, trademark or other right of a third party, you agree that LICENSOR, in its sole discretion, may terminate this license without any compensation or liability to you, your licensees or any other party. You agree upon termination of any kind to destroy or cause to be destroyed the Intellectual Property together with all copies in any form, whether held by you or by any third party.

Except as contained in this notice, the name of LICENSOR or of any other holder of a copyright in all or part of the Intellectual Property shall not be used in advertising or otherwise to promote the sale, use or other dealings in this Intellectual Property without prior written authorization of LICENSOR or such copyright holder. LICENSOR is and shall at all times be the sole entity that may authorize you or any third party to use certification marks, trademarks or other special designations to indicate compliance with any LICENSOR standards or specifications. This Agreement is governed by the laws of the Commonwealth of Massachusetts. The application to this Agreement of the United Nations Convention on Contracts for the International Sale of Goods is hereby expressly excluded. In the event any provision of this Agreement shall be deemed unenforceable, void or invalid, such provision shall be modified so as to make it valid and enforceable, and as so modified the entire Agreement shall remain in full force and effect. No decision, action or inaction by LICENSOR shall be construed to be a waiver of any rights or remedies available to it.

Contents

1. Scope 7

2. Conformance 8

3. References 9

4. Terms and Definitions 9

5. Conventions 10

5.1 Data dictionary tables 10

5.2 UML notation 11

5.3 Core and Extension Breakdown 12

6. Geospatial User Feedback 12

6.1 Quality Common 13

7. Geospatial User Feedback model: Core 13

7.1 Requirements Class Quality Common 13

7.2 Requirement Class User Feedback Item 19

7.3 Numeric Codelist for rating 28

8. Geospatial User Feedback model: Extensions 29

8.1 Requirements Class User Feedback Summary Extension 29

8.2 Requirements Class User Feedback Collection Extension 34

Annex A: Conformance Class Abstract Test Suite (Normative) 37

A.1 Conformance class: Quality Common 37

A.2 Conformance class: User Feedback-item 38

A.3 Conformance class: Feedback-summary 38

A.4 Conformance class: Feedback-collection 39

Annex B: Revision history 41

Bibliography 42

Figures

Figure 1: QCM_Publication in UML 14

Figure 2: QCM_DiscoveredIssue in UML. 18

Figure 3: GUF_UserFeedbackItem (fragment), GUF_UserInformation and GUF_FeedbackTarget in UML 20

Figure 4: GUF_FeedbackItem (fragment) description in UML 21

Figure 5: UFS_FeedbackSumary data model UML diagram 30

Figure 6: User Feedback Collection Extension classes in a UML diagram 35

Tables

Table 1 — Contents of data dictionary tables 11

Table 2 — QCM_Publication extension elements 14

Table 3 — QCM_CitationMotivationCode type 16

Table 4 — QCM_PublicationCategoryCode type 16

Table 5 — QCM_ DiscoveredIssue data type 18

Table 6 — GUF_FeedbackItem data type 21

Table 7 — GUF_UserInformation data type 23

Table 8 — GUF_UserRoleCode code list 23

Table 9 — GUF_FeedbackTarget data type 24

Table 10 — GUF_TargetRoleCode code list 25

Table 11 — GUF_UserComment data type 25

Table 12 — GUF_MotivationCode code list 25

Table 13 — GUF_UsageReport data type 26

Table 14 — GUF_ReportAspectCode code list 26
Table 15 — GUF_Rating data type 26
Table 16 — GUF_SignificantEvent data type 27
Table 17 — GUF_SignificantEventTypeCode code list 27
Table 18 — GUF_RatingCode numeric code type 28
Table 19 — GUF_ThumbsCode numeric code type 28
Table 20 — GUF_SignCode numeric code type 29
Table 21 — UFS_FeedbackSummary data type 30
Table 22 — UFS_ExpertiseLevelCount data type 32
Table 23 — UFS_UserRoleCount data type 32
Table 24 — UFS_TagCount data type 33
Table 25 — UFS_KeywordCount data type 33
Table 26 — UFS_RatingCount data type 33
Table 27 — UFS_RatingExpertiseLevelCount data type 33
Table 28 — UFC_FeedbackResponse data type 35
Table 29 — UFC_FeedbackCollection data type 35
Table 30 — UFC_ResponsePagination data type 36

i. Abstract

This standard defines a conceptual Geospatial User Feedback (GUF) data model. 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. 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. Initially an XML encoding following the ISO 19139 encoding rules is specified in a separate OGC implementation standard (OGC 15-098). In the future other encodings may be defined, including examples such as the use of JSON-LD based on parts of schema.org.

ii. Keywords

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

ogcdoc, ogc documents, user feedback, metadata, fitness-for-use, geospatial

iii. Preface

This standard is based on work done in two European Union 7th Framework program projects called GeoViQua (FP7 FP7/2007-2013 under grant agreement n°265178) and CHARMe (FP7/2007-2013 under grant agreement n°312641). GeoViQua considers user feedback as part of the metadata that allows users to assess the quality and fitness-for-use of geospatial datasets. GeoViQua developed its quality model based on ISO 19115-1:2014 and drafts of ISO19157:2013. The GeoViQua model is divided into the Producer Quality Model and the User Feedback Model. Both models are encoded in XML based on the ISO 19139 rules. The GeoViQua User Feedback Model[1] formed the initial basis of the model defined in this standard. CHARMe also focused on developing means for users to annotate datasets. The approach used in that project was based on W3C annotations and developed annotation conventions in RDF. Parts of the CHARMe conceptual model have been incorporated in the OGC GUF standards.

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.

[1] http://schemas.geoviqua.org

iv. Submitting organizations

The following organizations submitted this Document to the Open Geospatial Consortium Inc.

UAB-CREAF

Aston University

Fraunhofer Institute

52 North

v. Submitters

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

Name	Company
Joan Masó	UAB-CREAF
Lucy Bastin	Aston University
Simon Thum	Fraunhofer Institute
Daniel Nüst	52 North

1. Scope

This OGC® standard defines a data model for encoding user feedback about geospatial datasets or metadata records describing datasets. It reuses and extends the ISO 19115-1:2014 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, 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

This standard defines 4 conformance classes.

Requirements for standardization targets are considered:

- Requirement Quality Common [http://www.opengis.net/spec/geospatial-user-feedback/1.0/req/quality-common] has a single conformance class, Quality Common: [http://www.opengis.net/spec/geospatial-user-feedback/1.0/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/1.0/req/feedback-item] has a single conformance class, Feedback-item: [http://www.opengis.net/spec/geospatial-user-feedback/1.0/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/1.0/req/feedback-summary] has a single conformance class, Feedback-summary: [http://www.opengis.net/spec/ geospatial-user-feedback /1.0/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/1.0/req/feedback-collection] has a single conformance class, Feedback-collection: [http://www.opengis.net/spec/geospatial-user-feedback/1.0/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[2].

[2] www.opengeospatial.org/cite

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 ISO 19139 encoding rules are provided in a separated standard document (OGC 15-098). A JSON-LD encoding is also foreseen.

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

3. References

The following normative documents contain provisions that, through reference in this text, constitute provisions of this document. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the normative document referred to applies.

ISO / TC211: ISO 19115-1:2014 Geographic information -- Metadata -- Part 1: Fundamentals (2014)

ISO / TC 211: ISO 19157:2013 Geographic information -- Data quality (2013)

OGC: OGC 06-121r9 OGC Web Services Common Standard (2010)

OGC: OGC 08-131r3 The Specification Model - A Standard for Modular Specifications (2009)

4. Terms and Definitions

This document uses the terms defined in Sub-clause 5.3 of [OGC 06-121r8], 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.

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, 3.1.16]

4.2
item
anything that can be described and considered separately [ISO 19157:2003, 4.18]

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

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

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.

4.6
user
consumer of a resource

4.7
user comment
component of a user feedback item providing textual information with no structure

4.8
user feedback
information about a resource directly provided by users

4.9
user feedback item
unit of information provided by a user about related resources as a result of its usage

4.10
user feedback collection
collection of feedback items that are grouped by criteria, or are the result of a query

4.11
user feedback summary
statistical summary of a feedback collection

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
Names (left column)	The name is the UML model attribute or association role name. The name capitalization rules used are specified in Subclause 11.6.2 of [OGC 06-121r9]. 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 are no second items are included in rows of table)	Normally contains two items: 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). 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: 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)". 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.

5.2 UML notation

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]. Further, the following conventions hold:

- UML elements in white color come from ISO 19115-1:2014 or ISO 19157:2013;

- UML element names with prefix QCM (Quality Common Metadata) are those defined in the http://www.opengis.net/spec/geospatial-user-feedback/1.0/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/1.0/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/1.0/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/1.0/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. 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 Geospatial User Feedback Standard [OGC 15-098] XML Encoding Extension is initially provided. Other encodings may be specified in the future (such as a JSON-LD encoding based on parts of schema.org).

6. 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 (additional LineageSteps), 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. 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.

6.1 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.

7. Geospatial User Feedback model: Core

This section describes two requirements classes that are fundamental for describing Geospatial User Feedback items: the Quality Common and the User Feedback Item.

7.1 Requirements Class Quality Common

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 foundation for building a user feedback model. This requirements class inherits the ISO19115-1:2014 and the ISO19157:2013 metadata models (such as CI_Citation, CI_Date, etc) and adds two extra classes for citing publications (QCM_Publications) and for reporting discovery issues (QCM_DiscoveredIssues).

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.

Req 1 /req/quality-common/citation-of-publications:
The implementations of quality common *shall* follow the UML model as shown in Figure 1 . This model extendes 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.
Dependency: ISO19115-1:2014 and ISO19157:2013 data models

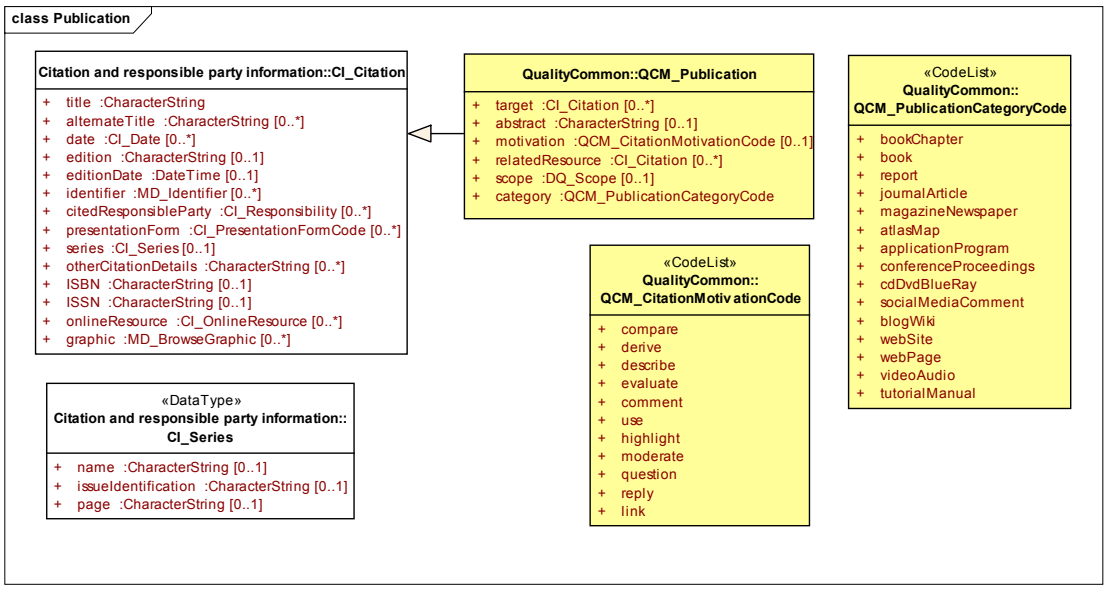

Figure 1: QCM_Publication in UML

Table 2 — QCM_Publication extension elements

Name	Definition	Data type 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)
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)

Name	Definition	Data type and values	Multiplicity and use
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)
motivation	Purpose of the citation. Why the citation is provided in relation to the parent class or the target.	QCM_CitationMotivation Code 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 ISO19157:2013, 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 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

Name	Definition
applicationProgram	Application program or a piece of software
conferenceProceedings	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

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.

Req 2 /req/quality-common/discovered-issues:
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.

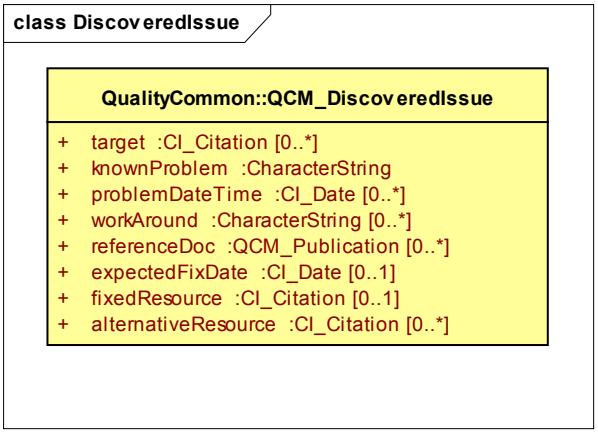

Figure 2: QCM_DiscoveredIssue in UML.

Table 5 — QCM_ DiscoveredIssue data type

Name	Definition	Data type and values	Multiplicity and use
Target	Link to the actual resource the publication is about.	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or open (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)
problemDateTime	Date when the problem was detected	CI_Date (ISO 19115-1:2014 B.3.2.6)	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.	CI_Date (ISO 19115-1:2014 B.3.2.6)	Zero or one (optional)
fixedResource	A new version of the target resource with the knownProblem is no longer present.	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or one (optional)
alternative Resource	An alternative resource that can be used instead of the target for similar purposes but does not present the	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or more (optional)

Name	Definition	Data type and values	Multiplicity and use
	knownProblem.		

7.2 Requirement Class User Feedback Item

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.

Req 3 /req/feedback-item/item:
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.
Dependency: /req/quality-common

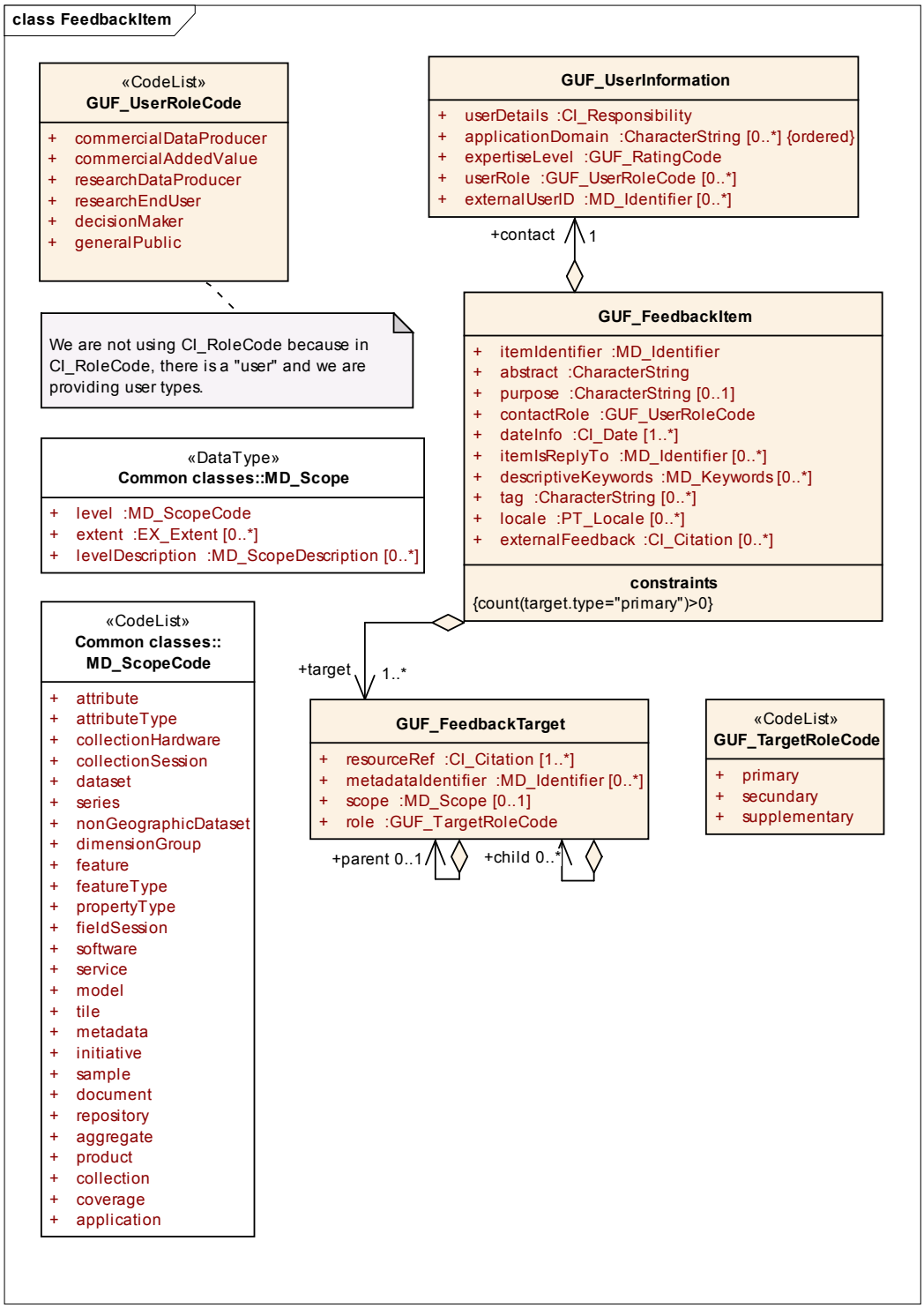

Figure 3: GUF_UserFeedbackItem (fragment), GUF_UserInformation and GUF_FeedbackTarget in UML

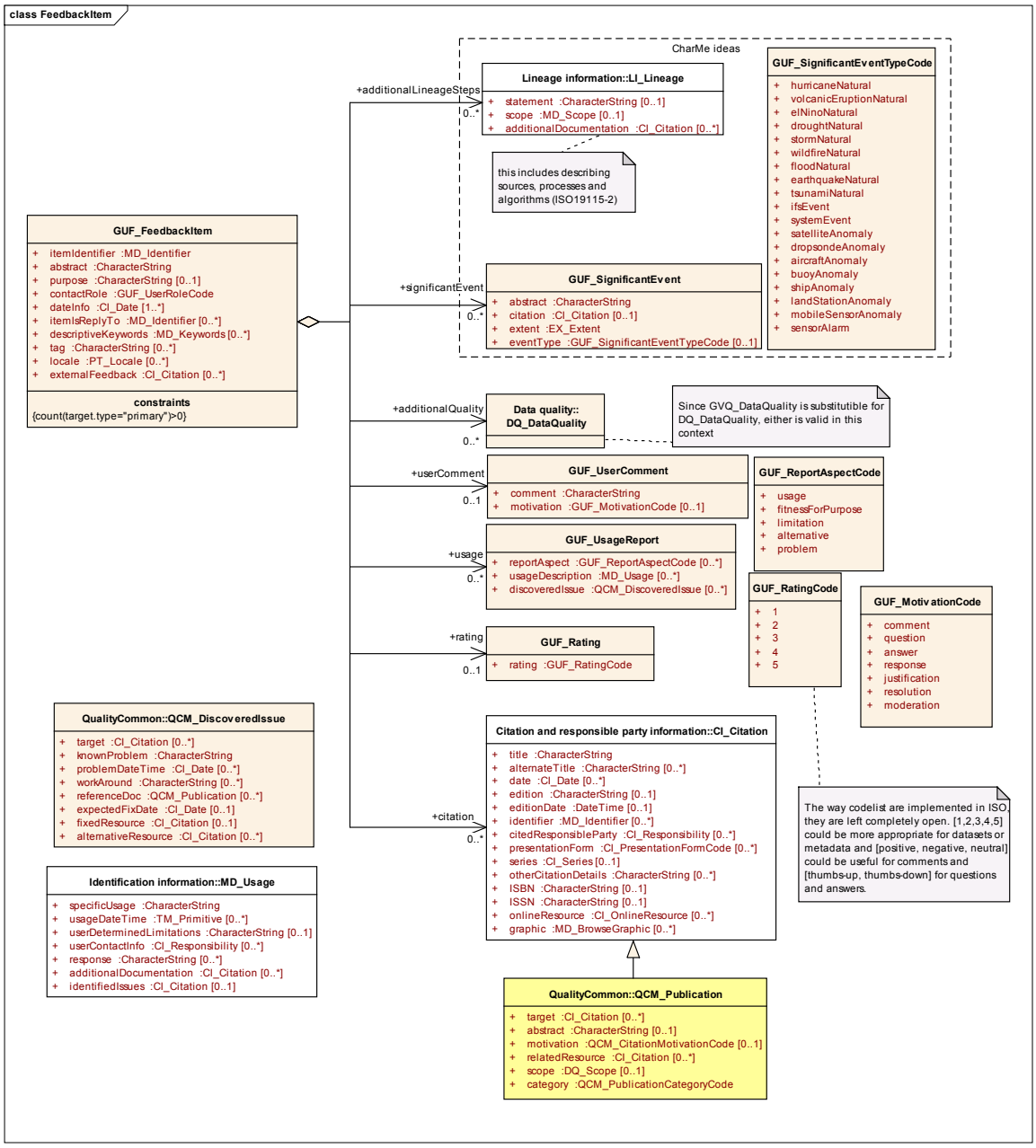

Figure 4: GUF_FeedbackItem (fragment) description in UML

Table 6 — 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 7)	One (mandatory)
contactRole	User's role in the context of this feedback item. A user may have several roles recorded in the GUF_UserInformation, but this is the one that applies for this feedback. [a]	GUF_UserRoleCode (see Table 8)	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	Keyworks 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 11)	Zero or one (optional) [b]
usage	Structured usage report	GUF_UsageReport (see Table 13)	Zero or more (optional) [b]
rating	Rating code reflecting the satisfaction of the user with the resource used	GUF_Rating (see Table 15)	Zero or one (optional) [b]

Name	Definition	Data type and values	Multiplicity and use
citation	Citation of a published resource (e.g.: a report, a peer reviewed paper) that provides and evaluation of the usage of the resource	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	Zero or more (optional) [b]
additionalLineage	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 16)	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 9)	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 7 — GUF_UserInformation data type

Name	Definition	Data type and values	Multiplicity and use
userDetails	Contact details about the user and its organization.	CI_Responsibility data type (ISO 19115-1:2014 B.3.2.2)	One (mandatory)
applicationDomain	Application domain(s) a user works in.	Character String type, not empty	Zero or more (optional)
expertiseLevel	User level of expertise in this particular context	GUF_RatingCode numeric code list (see Table 15)	One (mandatory)
userRole	The roles the user can play	GUF_UserRoleCode code list (see Table 8)	Zero or more (optional)
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 8 — GUF_UserRoleCode code list

Name	Definition

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 9 — GUF_FeedbackTarget data type

Name	Definition	Data type and values	Multiplicity and use
resourceRef [a]	Reference to a geospatial resource that is target of the feedback item or a super set of it [b]	CI_Citation data type (ISO 19115-1:2014 B.3.2.1)	One or more (mandatory) [c]
metadataIdentifier	Identifier for a metadata record about the resource	MD_Identifier data type (ISO 19115-1:2014 B.3.3.3)	Zero or more (optional)
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]
targetType	The role of the target with respect to the feedback item	GUF_TargetRoleCode code (see Table 10)	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

Table 10 — 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 11 — 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 12)	

Table 12 — GUF_MotivationCode code list

Names	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)
acceptedAnswer	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

Names	Definition
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

Table 13 — GUF_UsageReport data type

Name	Definition	Data type and values	Multiplicity and use
reportAspect	Aspect reported	GUF_ReportAspectCode code list (see Table 12)	One (mandatory)
usageDescription	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 14 — GUF_ReportAspectCode code list

Name	Definition
usage	Description of a usage of the target resource. At least one MD_Usage should be populated
fitnessForPurpose	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 15 — 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 18), GUF_ThumbsCode (see Table 19), GUF_SignCode (see Table 20) or other numerical code for rating	One (mandatory)

Table 16 — 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)
eventType	Type of event	GUF_SignificantEventTypeCode (see Table 17)	Zero or one (optional)

Table 17 — 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

Names	Definition
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 18, Table 19 and Table 20 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. This system is currently used in amazon.com and many other websites.

Table 18 — 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. This system is currently used in facebook.com “I like” and many other websites.

Table 19 — 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). This system is currently used to rate user reputation in ebay.com.

Table 20 — GUF_SignCode numeric code type

Number	Code	Definition
-1	negative	Negative
0	neutral	Neutral
1	positive	Positive

8. Geospatial User Feedback model: Extensions

This section describes two requirements classes that are considered extensions of the core: the User Feedback Summary and the User Feedback Collection.

8.1 Requirements Class User Feedback Summary Extension

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

Req 4 /req/feedback-summary/summary-model:
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

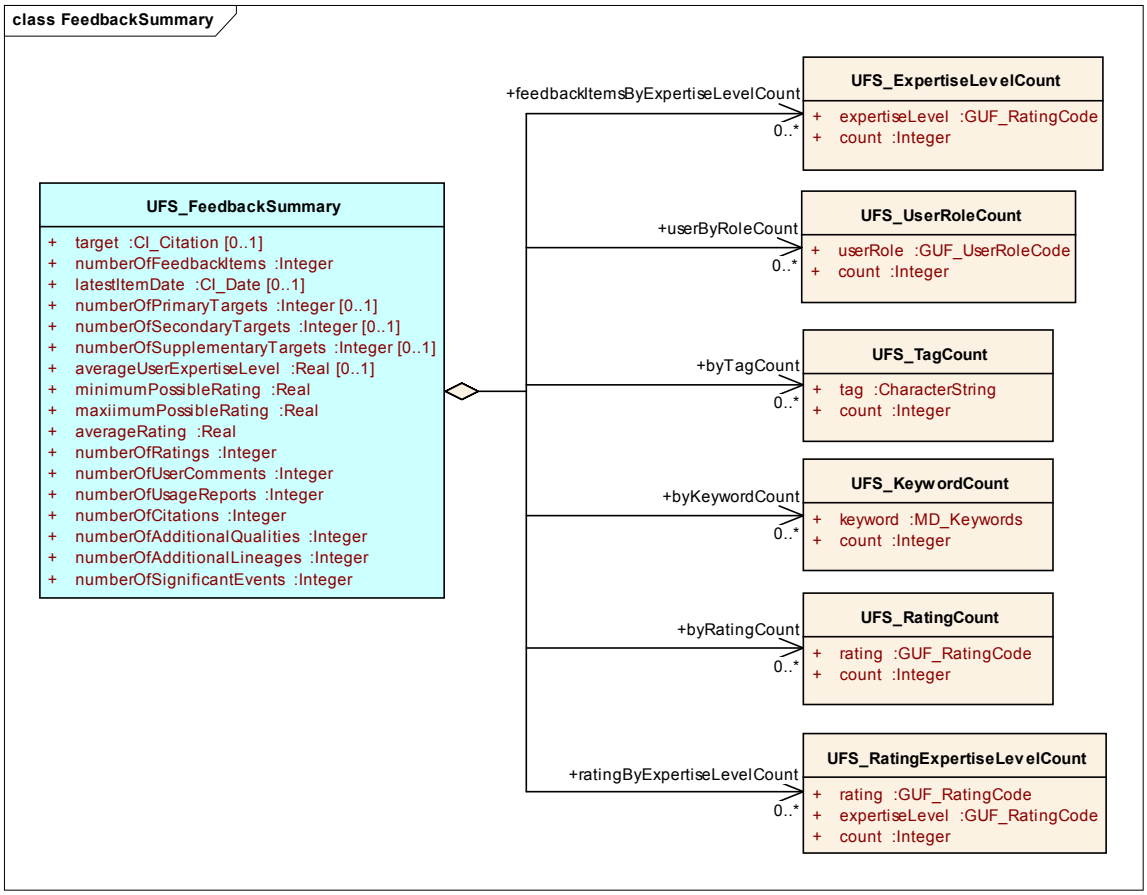

Figure 5: UFS_FeedbackSumary data model UML diagram

Table 21 — 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)
minimumPossibleRating	Minimum numeric value for a rating	Real type	One (mandatory)
maximumPossibleRating	Maximum numeric value for a rating	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)
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)
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 22)	Zero or more (optional) [a]

Names	Definition	Data type and values	Multiplicity and use
userByRoleCount	Number of feedback items for each user role	UFS_UserRoleCount data type (see Table 23)	Zero or more (optional) [b]
byTagCount	Number of feedback items for each tag	UFS_TagCount data type (see Table 24)	Zero or more (optional) [c]
byKeywordCount	Number of feedback items for each keyword	UFS_KeywordCount data type (see Table 25)	Zero or more (optional) [d]
byRatingCount	Number of feedback items for each rating value	UFS_RatingCount data type (see Table 26)	Zero or more (optional) [e]
ratingByExpertiseLevelCount	Number of feedback items for each rating and level of expertise	UFS_RatingExpertiseLevelCount data type (see Table 27)	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 22 — UFS_ExpertiseLevelCount data type

Names	Definition	Data type and values	Multiplicity and use
expertiseLevel	A possible value of expertise level	GUF_RatingCode data type (see Table 18)	One (mandatory)
count	Number of feedback items that were populated by this expertiseLevel code	Integer data type	One (mandatory)

Table 23 — UFS_UserRoleCount data type

Names	Definition	Data type and values	Multiplicity and use
userRole	A possible value of expertise level	GUF_UserRoleCode data type (see Table 8)	One (mandatory)

Names	Definition	Data type and values	Multiplicity and use
count	Number of time that a feedback items was populated by a user acting with this userRole code	Integer data type	One (mandatory)

Table 24 — 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 25 — 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 26 — UFS_RatingCount data type

Names	Definition	Data type and values	Multiplicity and use
rating	A possible value of expertise level	GUF_RatingCode (see Table 18), GUF_ThumbsCode (see Table 19), GUF_SignCode (see Table 20) 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 27 — UFS_RatingExpertiseLevelCount data type

Names	Definition	Data type and values	Multiplicity and use

Names	Definition	Data type and values	Multiplicity and use
rating	A possible value of rating	GUF_RatingCode (see Table 18), GUF_ThumbsCode (see Table 19), GUF_SignCode (see Table 20) or other numerical code for rating	One (mandatory)
expertiseLevel	A possible value of expertise level	GUF_RatingCode data type (see Table 18)	One (mandatory)
count	Number of feedback items that were populated with this rating-expertiseLevel code pair	Integer data type	One (mandatory)

8.2 Requirements Class User Feedback Collection Extension

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 a feedback items that share a common target and share the same rating code list.

Req 5 /req/feedback-collection/response:
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/

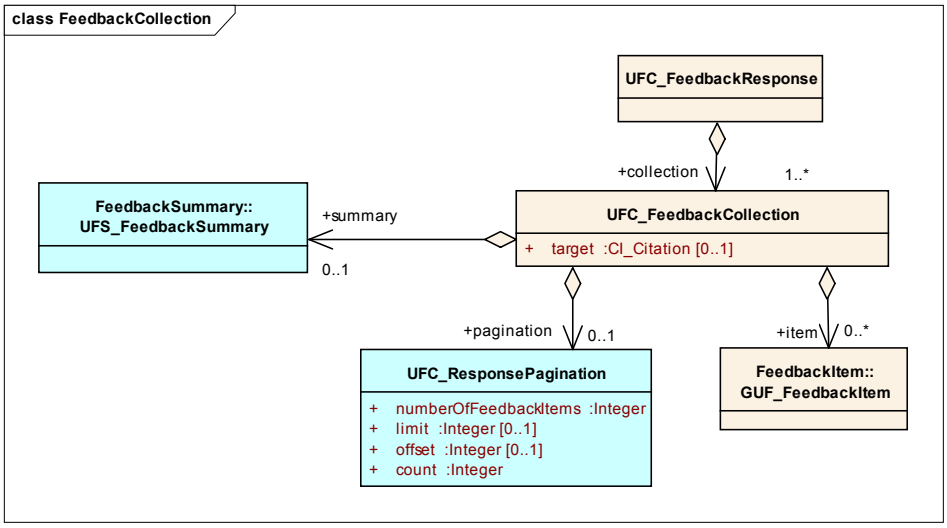

Figure 6: User Feedback Collection Extension classes in a UML diagram

Table 28 — UFC_FeedbackResponse data type

Names	Definition	Data type and values	Multiplicity and use
collection	Collection of feedback items	UFC_FeedbackCollection data type (see Table 29)	One or more (mandatory)

Req 6 /req/feedback-collection/collection:
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/

Table 29 — 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 6)	Zero or more (optional)
summary	Summary of the feedback items	UFS_FeedbackSummary data type (see Table 21)	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 30)	Zero or one (optional)

Req 7 /req/feedback-collection/pagination:
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/

Table 30 — 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)

Annex A: Conformance Class Abstract Test Suite (Normative)

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

A.1 Conformance class: Quality Common

The OGC URI identifier of this conformance class is:

http://www.opengis.net/spec/geospatial-user-feedback/1.0/conf/quality-common

Tests identifiers below are relative to http://www.opengis.net/spec/geospatial-user-feedback/1.0

A.1.1 Publications

Test id: **/conf/quality-common/citation-of-publications**

Test Purpose: **Req 1** /req/quality-common/citation-of-publications:
The implementations of quality common *shall* follow the UML model as shown in Figure 1 . This model extendes 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.
Dependency: ISO19115-1:2014 and ISO19157:2013 data models

Test method: Validate the requirements of publication citations

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.1.2 Discovered issues

Test id: **/conf/ quality-common/discovered-issues**

Test Purpose: **Req 2** /req/quality-common/discovered-issues:
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.

Test method: 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.2 Conformance class: User Feedback-item

The OGC URI identifier of this conformance class is:

http://www.opengis.net/spec/geospatial-user-feedback/1.0/conf/feedback-item

Tests identifiers below are relative to http://www.opengis.net/spec/geospatial-user-feedback/1.0

A.2.1 Feedback item

Test id: **/conf/feedback-item/item**

Test Purpose: **Req 3** /req/feedback-item/item:
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.
Dependency: /req/quality-common

Test method: Validate the requirements of feedback items

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.3 Conformance class: Feedback-summary

The OGC URI identifier of this conformance class is:

http://www.opengis.net/spec/geospatial-user-feedback/1.0/conf/feedback-summary

Tests identifiers below are relative to http://www.opengis.net/spec/geospatial-user-feedback/1.0

A.3.1 Feedback summary

Test id: **/conf/feedback-summary/summary-model**

Test Purpose: **Req 4** /req/feedback-summary/summary-model:
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: Validate the requirements of feedback summary

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.4 Conformance class: Feedback-collection

The OGC URI identifier of this conformance class is:

http://www.opengis.net/spec/geospatial-user-feedback/1.0/conf/feedback-collection

Tests identifiers below are relative to http://www.opengis.net/spec/geospatial-user-feedback/1.0

A.4.1 Feedback collection response

Test id: **/conf/feedback-collection/response**

Test Purpose: **Req 5** /req/feedback-collection/response:
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/

Test method: Validate the requirements of feedback collection responses

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.4.2 Feedback collection

Test id: **/conf/feedback-collection/collection**

Test Purpose: **Req 6** /req/feedback-collection/collection:
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/

Test method: Validate the requirements of feedback collections

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.4.3 Feedback collection response pagination

Test id: **/conf/feedback-collection/pagination**

Test Purpose: **Req 7** /req/feedback-collection/pagination:
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/

Test method: Validate the requirements of feedback collection responses with pagination

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.

Annex B: Revision history

Date	Release	Author	Paragraph modified	Description
2015-06-13	0.1	Joan Maso	All	First version
2015-08.25	0.2	Lucy Bastin	All	Careful revision
2015-08-31	0.3	Simon Thum	All	Provided input and minor edits

Bibliography

ISO: ISO 24619:2011 Language resource management -- Persistent identification and sustainable access (2011)

ISO: ISO 9000:2005 Quality management systems -- Fundamentals and vocabulary (2005)