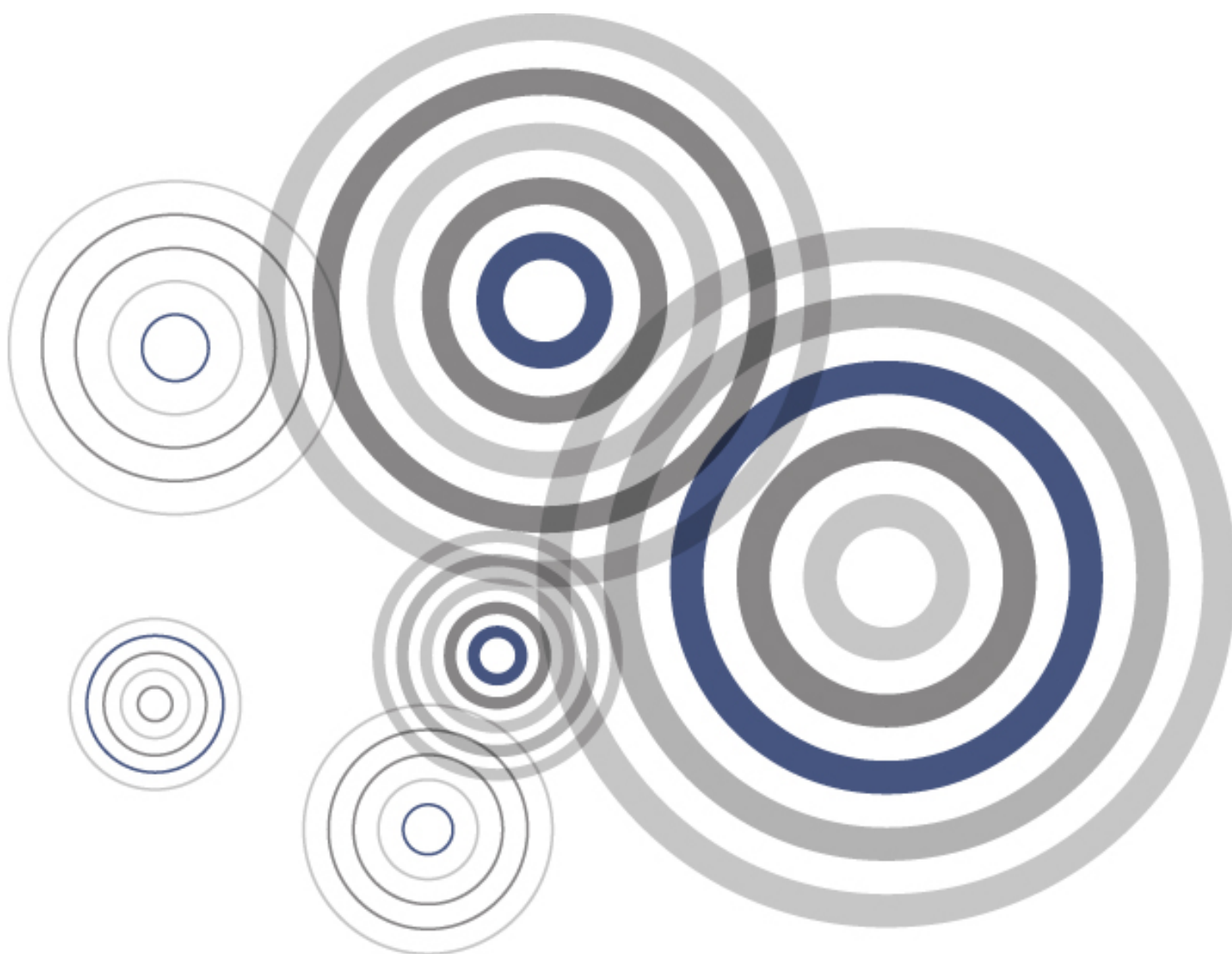


GLEIF Public

# GLEIF LEI Issuer Data Quality Report Dictionary

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## Contents

LEI Issuer Data Quality Report Glossary .....	3
1. Chapter 1: Preface.....	5
1.1. Purpose of the LEI Issuer Data Quality Reports.....	5
1.2. Source for the LEI Issuer Data Quality Reports .....	5
1.3. GLEIS's Data Quality Criteria .....	5
1.4. GLEIS's Rule Setting .....	6
1.5. GLEIS's Maturity Levels .....	7
2. Chapter 2: Data Quality Scores .....	8
2.1. General Descriptors.....	8
2.2. Conceptual Calculation.....	8
2.3. Checks .....	11
2.4. Failed records .....	11
2.5. Top 5 failing checks .....	12
2.6. LEI Issuer Total Data Quality Score.....	12
2.7. Data Quality in Covered Countries .....	15
3. Chapter 3: Quality Maturity Levels.....	16
4. Chapter 4: Statistics.....	19
4.1. LEI Issuer Totals .....	19
4.2. Level 2 Info .....	20
4.3. Duplicates.....	20
4.4. Challenges .....	20
4.5. Files .....	21

## LEI Issuer Data Quality Report Glossary

Term	Definition
Common Data File format (CDF)	<p>The Common Data File Formats (X-CDF) provide the specificity needed for the operational implementation of the ISO standard. The three CDF files that these reports are concerned with are:</p> <ul style="list-style-type: none"> <li>- LEI-CDF - defines how Level 1 data, i.e. the information on 'who is who', is reported.</li> <li>- Relationship-Record-CDF (RR-CDF) - Defines how Level 2 data, i.e. information on 'who owns whom', is reported for LEI registrants whose direct and ultimate parents have an LEI.</li> <li>- Reporting Exceptions (RepEx) format - If the child legal entity reports an exception, a record in this format is generated for the parent entity. Each record refers to a child legal entity, indicates whether the exception applies to the direct or ultimate parent and provides the reporting exception.</li> </ul>
Check	A Check is the execution of a data rule.
GLEIS	A Global LEI System (a framework) for the issuance of unambiguous LEI records.
LEI	The Legal Entity Identifier (LEI) is a unique 20-character alphanumeric code based on the ISO 17442 standard developed by the International Organization for Standardization.
Level 1	The business card information available with the LEI reference data, e.g. the official name of a legal entity and its registered address.
Level 2	Level 2 data refers to the relationship data of an LEI record and answers the question of 'who owns whom'.
Source Files	The XML data file provided by an LEI Issuer, containing LEIs and their reference data according to the Common Data File format.
Tachometer	For the purposes of this report, a visual representation of the LEI Total Data Quality Score, on a scale of 0 - 100 (in percentages) that resembles a traditional RPM gauge.
XSD (Schema)	The XSD (XML Schema Definition) specifies how to organize and describe the elements of any particular CDF. Where applicable, 'Schema' will be used throughout this document.

Term	Definition
XML	Extensible Markup Language is a language that sets rules for information encoding.

## 1. Chapter 1: Preface

This is a general description of how the monthly Data Quality Reports for each LEI Issuer are generated from the source files provided by them. It is not seen as a complementary monthly document, as it is only concerned with the general calculations, and not the specific content of each LEI Issuer Data Quality Report. This document structure is 'deductive' in its reasoning, working from the general structure of the formulas used in the LEI Issuer Data Quality Report to particular examples and specifics. Each chapter, where needed or noted, will have a particular paragraph distinguished in bold of where to find the particular element or elements in these reports. It is important to notice that the screenshots used in this document serve as companions to the examples provided, and might not be found with the values shown here in any report.

### 1.1. Purpose of the LEI Issuer Data Quality Reports

The LEI Issuer Data Quality Reports summarize the results of GLEIF's assessment of the level of data quality per each LEI Issuer at an end-of-month basis. They serve as companions of the aggregated Data Quality Report for the Global LEI System. The LEI Issuer Data Quality Reports demonstrate the level of data quality already achieved in the Global LEI System to date. The GLEIF data quality management program ensures that the LEI remains the industry standard best suited to providing open and reliable data for unique legal entity identification management.

### 1.2. Source for the LEI Issuer Data Quality Reports

The LEI Issuer Data Quality Reports are generated from the information contained in the file that each LEI Issuer provides to GLEIF. The field "Originator" from the header, is only used for data quality purposes, rather than for mapping purposes.

In other words, any LEI Issuer will get a data quality report based on the information that is contained in the source file that they provided, regardless of whether ANY LEI in this file has a Managing LOU that corresponds to the LEI Issuer that issued this file, or whether any other LEI Issuer published a file and populated this field with another LEI Issuer's LEI.

### 1.3. GLEIF's Data Quality Criteria

To clarify the concept of data quality with regard to the LEI population, GLEIF has defined, in close dialog with the LEI Regulatory Oversight Committee and the LEI issuing organizations, a set of measurable quality criteria using standards developed by the International Organization for Standardization (ISO). Instituting a set of defined quality criteria establishes a transparent and objective benchmark to assess the level of data quality within the Global LEI System.

The LEI Issuer Data Quality Report contains the list of data quality criteria already implemented. The full defined 12 data quality criteria will be implemented over time.

Accuracy	The extent to which the data are free of identifiable errors; the degree of conformity of a data element or a data set to an authoritative source that is deemed to be correct; and the degree to which the data correctly represents the truth about real-world objects.
Accessibility	Data items that are easily obtainable and legal to access with strong protections and controls built into the process.
Completeness	The degree to which all required occurrences of data are populated.
Comprehensiveness	All required data items are included - ensures that the entire scope of the data is collected with intentional limitations documented.
Consistency	The degree to which a unique piece of data holds the same value across multiple data sets.
Currency	The extent to which data are up-to-date; a datum value being up-to-date if it is current at a specific point in time, and outdated if it was previously current but then incorrect at a later time.
Integrity	The degree of conformity to defined data relationship rules (e.g., primary/foreign key referential integrity).
Provenance	History or pedigree of a property value.
Representation	The characteristic of data quality that addresses the format, pattern, legibility, and usefulness of data for its intended use.
Timeliness	The degree to which data is available when it is required.
Uniqueness	The extent to which all distinct values of data elements appear only once.
Validity	The measure of how a data value conforms to its domain value set (i.e., a set of allowable values or range of values).

## 1.4. GLEIS's Rule Setting

To measure the data quality criteria, Checks have been defined based on the Common Data File format. These LEI Checks are measured at different LEI data hierarchy levels:

Meta Checks are not measured in the data file itself. These checks focus on timeliness, currency and accessibility of the data. The harder it is for the general public to access the information, the lower the accessibility. The more up-to-date the files that contain the relevant information are, the more current it is. And the easier it is to access the information in a timely manner, regardless of timeframe, if it is available, the more 'timeliness' it has.

Format Checks are implemented on the file level, i.e. whether the files are compliant with the XML standard and Common Data File format. If a file is non-compliant to the standard, the information cannot be aggregated and therefore the data quality cannot be assessed. In this regard, if a data quality assessment cannot be performed for a particular source file at the end of the month, the report will be generated from the last available file that could be assessed, as this information is used for the concatenation appearing in the Global LEI Index. Starting with the LEI-CDF 2.1, RR-CDF 1.0 and RepEx 1.0, there are no more 'File' or 'Source' checks, as the schemas will enforce strict compliance. Some previous checks that were classified as 'Representation' have been deprecated, as the relevant schemas will now strictly validate these fields.

'Checks' (as used throughout this document) then apply to mandatory and optional elements, format per element, plausibility checks like value ranges, relationships between elements of one record (Relation Checks between fields of one LEI record), as well as relationships and/or parent exceptions (for Level 2 data). These checks comprise the totality of the checks for data quality assessments file.

Additionally, there are several Checks (not strictly associated with this data quality assessment) on multiple records (Relation Checks between data in the upload file and data in the LEI repository). A prominent example of the latter is the check for duplicates. These checks ensure internal consistency in the ecosystem: they serve as a second level threshold of trust, firstly when the information gathered by the LEI Issuer is truthful and valid, and secondly, when the information is unique, and the relevant relationships from these records can verifiably be based on actual parameters.

The list of implemented data quality checks can be downloaded from GLEIF's website: LEI Data -> GLEIF Data Quality Management -> Supporting Documents -> Data Quality Rule Setting.

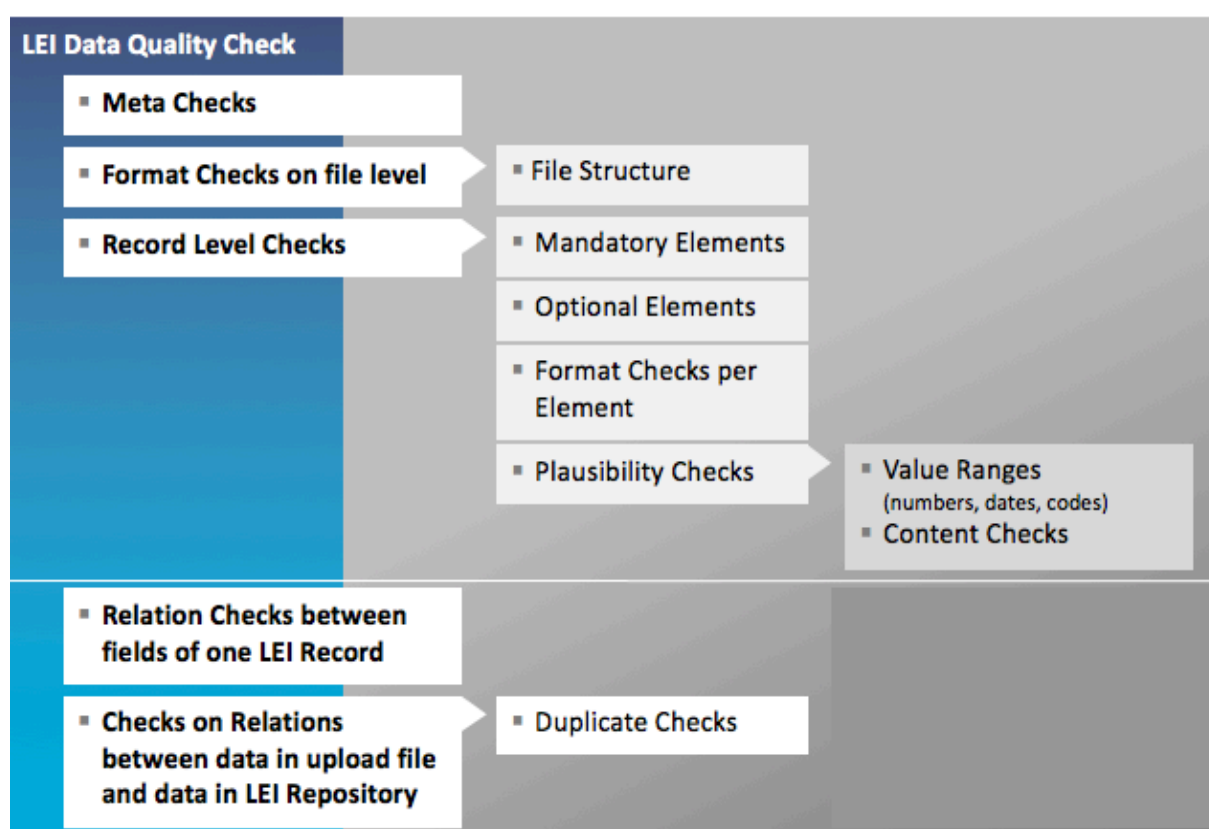


Figure 1 Data quality rule settings in the Global LEI System.

## 1.5. GLEIS's Maturity Levels

Maturity levels define the evolution of improvements in processes associated with what is measured. Therefore, they are scored differently from data quality criteria: while the scoring rules apply in a similar way, higher maturity levels can only be scored if the previous maturity level is fully achieved.

The following maturity levels apply:

Level 1 – 'Required Quality' (must be 100 percent for all data records).

Level 2 – 'Expected Quality' (should be 100 percent).

Level 3 – 'Excellent Quality' (the higher the better).

## 2. Chapter 2: Data Quality Scores

This chapter describes the Checks and their relationship with the scores they generate. First the 12 data quality criteria are introduced for which individual quality scores are calculated. The total data quality score is the average of these individual scores.

All files are based on the Common Data File format, for each type (LEI Records (LEI-CDF), Relationship Records (RR-CDF) and Exception Records (RepEx)).

GLEIF obtains each of these files daily per LEI Issuer:

- One LEI-CDF file.
- One RR-CDF file.
- One RepEx file.

The first file comprises one or more LEI records, each containing data fields relevant to the Legal Entity (i.e. Legal Name, Address, Country etc.), while the RR and RepEx files contain information on the relationships or reporting exceptions.

The omission, inclusion or intra- and inter-relationship of fields is evaluated by Checks that yield either 'success'/'not applicable' (1) or 'failure' (0). These results are used to create the monthly LEI Issuer data quality reports.

### 2.1. General Descriptors

The 12 defined data quality criteria are the measure points for the overall data quality:

Accuracy, Accessibility, Completeness, Comprehensiveness, Consistency, Currency, Integrity, Provenance, Representation, Timeliness, Uniqueness, Validity.

### 2.2. Conceptual Calculation

The score ( $Q_s$ ) for every data quality criterion is calculated as follows. Each Check represents only one data quality criterion, regardless of the possible overlap they might have, and each check results into a value of 1 or 0.

Each Check is of type 'If X then Y', where 'X' is described as a 'Check precondition' and 'Y' is the 'Check description'. If a Record, relationship or exception do not fall into the 'Check precondition', this check is 'not applicable'. If it passes the precondition and goes into the description and the value does not fulfil 'Y', the check is a fail (i.e. returns the value 0).

The general formula for scoring the data quality criteria is the following. Note that this formula is applied either to each 'record' when concerned with the contents of a particular LEI record, relationship or exception (as the checks are Record based, meaning they start from the LEI Record and move onwards).



$$Q_s = \frac{\sum_{i=1}^I q_i}{I}$$

Equation 1

Where:

- $Q_s$  is the quality score for the respective quality criterion.
- $q_i$  is the  $i^{th}$  check result for the respective quality criterion with:  

$$q_i = \begin{cases} 1 & \text{if check is "success" or "not applicable"} \\ 0 & \text{if check is "failed"} \end{cases}$$
- $I$  is the total number of data quality checks performed for the respective quality criterion.

Quality criteria scores ( $Q_s$ ) are the percentages of “successful” and “not applicable” data quality checks in relation to the total number of data quality checks for the respective quality criterion.

An added layer of complexity arises when considering that any particular source file might contain more than one LEI record. A 'Check' is any particular Check that is applied to individual LEI records. To illustrate we assume 10 Record Checks and an LEI Issuer supplying a file with 100 LEI records. This would result in a total of 1,000 checks being performed:

$$(I = 10 \text{ records} * 100 \text{ LEI Records}).$$

### Example 1:

In a scenario where only one LEI Issuer exists, which publishes only one LEI record ('record 1' in the table below), this source file is run through 10 'Validity' Checks. This LEI Issuer failed its first and tenth checks (i.e.  $q_{1,10} = 0$ ) and had a 'not applicable' in its 3<sup>rd</sup> and 7<sup>th</sup> checks. All other Checks were successful. Note that both non-applicable and successful checks are regarded as positive Checks (i.e.  $q_i = 1$ ). Therefore:

	LEI Issuer
1 <sup>st</sup> "Check" for Validity for LEI record 1	$q_1 = 0$
2 <sup>nd</sup> "Check" for Validity for LEI record 1	$q_2 = 1$
3 <sup>rd</sup> "Check" for Validity for LEI record 1	$q_3 = 1$
4 <sup>th</sup> "Check" for Validity for LEI record 1	$q_4 = 1$
5 <sup>th</sup> "Check" for Validity for LEI record 1	$q_5 = 1$
6 <sup>th</sup> "Check" for Validity for LEI record 1	$q_6 = 1$
7 <sup>th</sup> "Check" for Validity for LEI record 1	$q_7 = 1$
8 <sup>th</sup> "Check" for Validity for LEI record 1	$q_8 = 1$
9 <sup>th</sup> "Check" for Validity for LEI record 1	$q_9 = 1$

10 <sup>th</sup> "Check" for Validity for LEI record 1	$q_{10} = 0$
Total performed Checks	$I = 10$

Table 1 Quality Checks for the first example.

In this scenario, the total number of Checks performed for 'Validity' would be 10 ( $I = 10$ ). In the following equation, this example shows that - as noted earlier - when a Check is considered not applicable, it is counted as a success (to avoid penalizing the score).

According to Equation 1, the quality score for 'Validity' for this LEI Issuer would be the following:

$$Q_s = \frac{\sum_{i=1}^{10} q_i}{10} = \frac{0 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 0}{10} = 0.8$$

Equation 2

### In the LEI Issuer Data Quality Report

In the example referred in the previous formula, this means that in the LEI Issuer Data Quality Report, the overall 'Validity' for that month would be 80%:

Data Quality Criteria	Jan	Dec
Accuracy	28.39 %	29.50 %
Completeness	3.35 %	61.38 %
Comprehensiveness	22.70 %	58.58 %
Consistency	26.00 %	90.00 %
Currency	71.44 %	70.30 %
Integrity	52.80 %	100.00 %
Uniqueness	12.00 %	100.00 %
Validity	80.00 %	12.93 %

Figure 2 The Data Quality Criteria per month, and how it is to be found in the report.

In general, quality scores will be presented as percentages. So for example 0.8 will be represented as 80%. A full example of the calculation of the remaining quality criteria will be provided in section 2.4.

The quality scores in the previous formula can apply to a multitude of records with a simple extension.

## 2.3. Checks

Immediately to the right of the previous screenshot the '# Checks' column is located. This indicates, on a per row basis, the count of checks per quality criterion. As there is no weighting between the checks, this helps to visualize why a particular quality criterion might be over or under represented in the score calculation.

# Checks
7
1
2
16
1
15
1
15

Figure 3 The # Checks column, and how it is to be found in the report.

## 2.4. Failed records

To the right of the previous column, the '# Failed Records' column is located. This column shows the count of Records that failed at least 1 check of any particular criterion. Next to the integer number, in parenthesis, is the percentage of records that are failing checks of this particular criterion in relation to the total count of checks performed of this same type.

# Failed Records
0 (0 %)
28 (0.32 %)
0 (0 %)
234 (2.75 %)
0 (0 %)
1 (0.01 %)
1 (0.01 %)
194 (2.28 %)

Figure 4 The # Failed Records column, and how it is to be found in the report.

## 2.5. Top 5 failing checks

Next to the table 'Data Quality Criteria', the 'Top 5 Failing Checks' table is located. This table lists the most common checks that the particular LEI Issuer has failed. If there are no failed checks this table will remain empty. If there are less than 5 distinct checks being failed, only the ones being failed will be listed. The key 'C000XXX' on the left will list the check number as it is to be found in the current Data Quality Rule Setting document, the document that defines all data quality checks. Next to it, the number of records that failed this check, and to the right of that, the Check description ('Y') as stated above.

### Top 5 Failing Checks

	# Failed Records	Check description
<a href="#">C000260</a>	934	RelationshipPeriods with PeriodType RELATIONSH...
<a href="#">C000260</a>	883	RelationshipPeriods with PeriodType RELATIONSH...
<a href="#">C000266</a>	620	then RelationshipPeriods with PeriodType of ACCO...
<a href="#">C000266</a>	581	then RelationshipPeriods with PeriodType of ACCO...
<a href="#">C000267</a>	442	a RelationshipPeriod with PeriodType ACCOUNTI...

Figure 5 The # Failed Records table, and how is to be found in the report.

## 2.6. LEI Issuer Total Data Quality Score

The total data quality score of the data quality criteria takes the average of the individual quality criteria scores (as previously mentioned  $Q_s$ ). This average is **not** weighted by data quality criterion, meaning that each data quality criteria contributes equally to the LEI Issuer total data quality score. The LEI Issuer Total Data Quality score ( $LTQ_s$ ) is therefore:

$$LTQ_s = \frac{\sum_{s=1}^N Q_s}{N}$$

Equation 3

Where:

- $LTQ_s$  is the LEI Issuer Total Data Quality Score.
- $s$  in the summation is an index representing individual quality criteria.
- $Q_s$  is the quality score for each respective quality criterion.
- $N$  is the number of quality criteria for which there are Checks implemented.

### Example 2:

In the following example we assume 7 data quality criteria and 7,000 performed Checks. The results of the checks are to be found in the following table:

Criteria	Success	Failure	Not Applicable	Total Checks Performed
Accuracy	1,000	0	0	1,000
Completeness	1,000	0	0	1,000
Comprehensiveness	1,000	0	0	1,000
Consistency	0	0	1,000	1,000
Currency	0	0	1,000	1,000
Integrity	0	0	1,000	1,000
Uniqueness	995	5	0	1,000
Validity	0	0	1,000	1,000
Total	3,995	5	4,000	8,000

Table 2 Quality Criteria Checks for the second example.

In this example each quality score, according to Equation 1, is then the following (expressed in percentages):

Criteria	Scores (in percentages)
Accuracy	100.00%
Completeness	100.00%
Comprehensiveness	100.00%
Consistency	100.00%
Currency	100.00%
Integrity	100.00%
Uniqueness	99.50%
Validity	100.00%

Table 3 Quality criteria and scores

For details on calculating the individual quality criteria scores using Equation 1, please refer to Example 1 in Section 2.2.

The total data quality score for this example, according to Equation 3, would be then:

$$LTQ_s = \frac{1 + 1 + 1 + 1 + 1 + .995 + 1 + 1}{8} = 0.999375$$

### In the LEI Issuer Data Quality Report

In the LEI Issuer Data Quality Report the LEI Issuer Total Data Quality Score is shown three times:

- First, in the tachometer (current month, Figure 6).
- Second, in the three months trend chart, (Figure 4), which is the data quality of the LEI Issuer for the past three months.
- Third, in the time series trend chart which shows the LEI Issuer Data Quality against the LEI Pool Average, the latter, which is calculated in the Global LEI Data Quality Report (current and previous twelve months, Figure 8).

### LEI Issuer Total Data Quality Score

The LEI Issuer Total Data Quality Score is calculated as the equal weighted average of the 8 'Data Quality Criteria'.

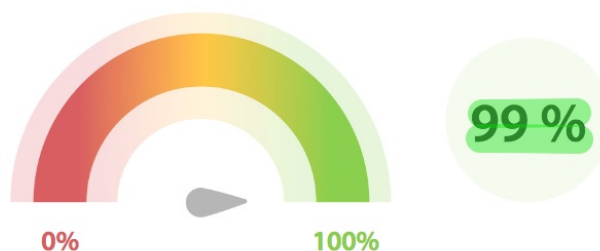


Figure 6 The LEI Issuer Total Data Quality Score displayed as a tachometer (for the month referred in the report).

### LEI Issuer Total Data Quality Score Trend

Progress achieved with regard to the continuous optimization of the data quality based on the LEI Issuer Total Data Quality Score.

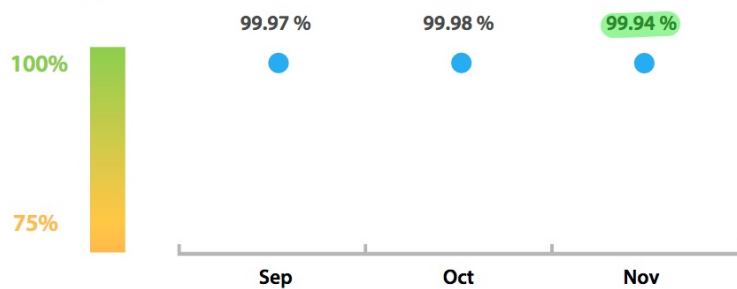


Figure 7 The LEI Issuer Total Data Quality Score Trend.

### LEI Issuer Data Quality (●) against LEI Pool Average (■)

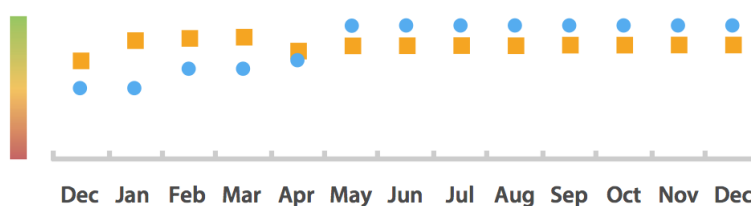


Figure 8 The LEI Issuer Total Data Quality Score time series trend chart compared against the LEI Total Data Quality Score.

## 2.7. Data Quality in Covered Countries

This section is concerned with the implementation of quality criteria associated to the countries (as per the ISO-3166 standard) where the LEI Issuer has presence.

The heatmap shows the exact same representation regardless of the coverage that any particular LEI Issuer has. This means that, if any particular LEI Issuer has presence in a limited geographical scope, the map will be the same as an LEI Issuer that has worldwide presence.

The colors represented in the heatmap show the data quality score achieved by the LEI issuing organization in the countries where it issues LEIs:

Red (equal or less than 90%); orange (above 90% and equal or less than 95%); yellow (above 95% and equal or less than 98%); green (above 98% and equal or less than 100%).

The formula for the calculation of the quality scores for individual countries is similar to the total quality scores, that means, it takes into consideration the average of the quality criteria:

$$TQ_{Country} = \frac{\sum_{i=1}^{N_{Country}} q_{i,Country}}{N_{Country}}$$

Equation 4

Where:

- $TQ_{Country}$  is the total data quality score for a given country.
- $q_{i,Country}$  is the  $i^{th}$  check result for a country:
 
$$q_{i,Country} = \begin{cases} 1 & \text{if check is "success" or "not applicable"} \\ 0 & \text{if check is "failed"} \end{cases}$$
- $N_{Country}$  is the number of checks performed for the respective country.

### In the LEI Issuer Data Quality Report

The following heatmap shows the coverage of any LEI Issuer with the colors previously described, countries that are not covered are greyed out:

#### Data Quality in Covered Countries

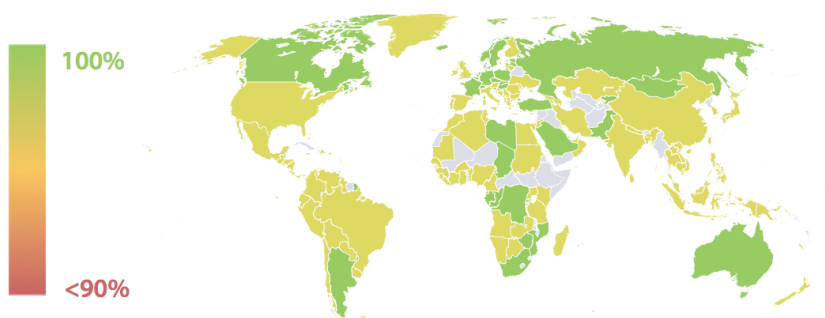


Figure 9 Heatmap.

### 3. Chapter 3: Quality Maturity Levels

Maturity levels define the evolution of improvements in processes associated with what is measured. Therefore, the total maturity level score is aggregated differently from the total data quality score: while the scoring rules for the individual maturity levels apply in the same fashion, the scores for higher maturity levels will only contribute to the total score if the previous maturity level is fully reached (i.e. 100% score).

The LEI Issuer maturity level score is reported as a number between 0 and 3, with two decimals. For this, the individual maturity level scores are aggregated, subject to the above rule that a maturity level is only considered if the previous maturity level was fully reached.

As an example, assuming the maturity level scores:

- Maturity level 1: 99%.
- Maturity level 2: 100%.
- Maturity level 3: 100%.

The aggregated score would be 0.99. Note that maturity levels 2 and 3 do not affect the aggregated score, as maturity level 1 is not fully reached. The same example is illustrated in more detail in Example 3.

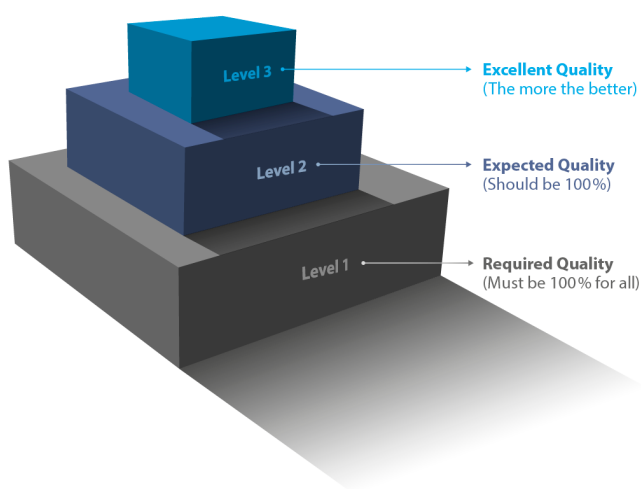


Figure 10 Maturity model.

#### General Descriptors

There are 3 maturity levels:

- 1 - Required: This level reflects repeatable success and is achieved when the following data quality checks are attained:
  - all format checks on file level succeed.
  - all record level checks regarding mandatory elements and format checks per element succeed.



- all relation checks between fields of one LEI record succeed.
- 2 - Expected: This level shows the managed success and is reached when the following data quality checks are passed:
  - all record level checks regarding optional elements and plausibility checks succeed.
  - all checks on relations between data in upload file and data in LEI repository succeed.
- 3 - Excellent: The third level is that of optimized success.

The maturity level scores are also calculated based on the source files received by GLEIF. As per before, each LEI Issuer will get one maturity level score as per these calculations, based on the information from these files. It could be, in the early stages of the GLEIS, that any particular LEI Issuer might have a higher maturity level than the global. The maturity levels are mutually exclusive and non-overlapping. This means that a particular Check can only count for one maturity level.

The general formula for maturity levels is conceptually identical to the one for the quality criteria scores (see Equation 1). The only difference is, that the “grouping” is now based on the maturity levels as opposed to the data quality criteria, as emphasized by the variable names:

$$ML_s = \frac{\sum_{i=1}^I ml_i}{I}$$

Equation 5

Where:

- $ML_s$  is the maturity level score for the particular maturity level.
- $ml_i$  is the  $i^{th}$  check result for the particular maturity level with:
 
$$ml_i = \begin{cases} 1 & \text{if check is "success" or "not applicable"} \\ 0 & \text{if check is "failed"} \end{cases}$$
- $I$  is the number of total checks performed for the respective maturity level.

The numerator in the above formula is essentially the number of successful and non-applicable Checks for the respective maturity level.

### In the LEI Issuer Data Quality Report

Like the LEI Issuer data quality score, the LEI Issuer quality maturity level model shows the maturity of the LEI portfolio managed by the LEI Issuer during the assessment. The model shows the maturity level as per the assessment. The model will also show the evolution or devolution of the maturity level on a per monthly basis, with the last two months underneath.

## Quality Maturity Level



Figure 11 The LEI Issuer Quality Maturity Level score in its chart representation.

### Example 3:

This section elaborates on the example in section 2.7 assuming 300 performed Checks. The following table shows the three maturity levels and the hypothetical number of checks associated with the respective maturity level.

Maturity Level	Total Checks Performed
1	100
2	100
3	100
Total	300

Table 4 Example of maturity levels and number of associated checks

The following check results are assumed:

Maturity Level	Success	Failure	Not Applicable	Total Checks Performed
1	99	1	0	100
2	100	0	0	100
3	0	0	100	100
Total	199	1	100	300

Table 5 Extended maturity level scores

The scores for the maturity levels are calculated with Equation 5. In this example, the maturity level score for the 1<sup>st</sup> level is 99%, as one check is 'Failure', and for the 2<sup>nd</sup> and 3<sup>rd</sup> maturity level (although for this last one all checks are 'Non-applicable' and therefore successful, as the score is calculated as 1 – failed checks) the scores are 100%, but will not be considered in the aggregated score as maturity level 1 did not achieve 100% (as stated in section 2.7). The LEI Issuer quality maturity level score is thus 0.99.

## 4. Chapter 4: Statistics

### 4.1. LEI Issuer Totals

The 'Totals' part contains general information about the LEI Issuer data. Note that the same restrictions as from section 1.2 apply for every measurement in this section:

- Managed LEIs: The count of LEIs present in the file as of the assessment.
- Active entities managed: The count of entities whose Entity/EntityStatus field is populated as ACTIVE.
- Inactive entities managed: The count of entities whose Entity/EntityStatus field is populated as INACTIVE.
- Covered countries: The count of countries whose LegalJurisdiction:CountryCode field is populated.
- New lapsed LEIs: The count of LEIs that switched their RegistrationStatus into LAPSED in the report month.

#### In the LEI Issuer Data Quality Report

The following figure shows any particular LEI Issuer Totals table, with the percentage change:

Totals	Values
Managed LEIs	320,050 (+7.50 %)
Active entities managed	314,688 (+7.60 %)
Inactive entities managed	5,362 (+2.09 %)
Covered countries	196 (+1.03 %)
New lapsed LEIs *	2,931 (N/A)

Figure 12 LEI Issuer Totals measurement, with percentage assignment.

#### Percentage assignment

For this chapter, the values displayed are followed by a number in parenthesis. This percentage assignment represents the change that was measured from the previous assessment to the current assessment. The numbers are positive (+X%) when there is an increase with regards to the previous month, and negative (-X%) when the number decreases. Note that there is no valid judgment on whether this value is inherently positive or negative towards the LEI Issuer in particular or GLEIS in general, it only shows the change. The percentage assignment is used throughout this chapter.

## 4.2. Level 2 Info

This table shows the count of LEIs that have ownership relationships to parents with LEIs.

It also shows the count of LEIs that currently report a complete set of parent information (either relationships or exceptions).

Level 2 Info	Values
LEIs with LEI parent relationships	198 (N/A)
LEIs with complete parent information	6,891 (N/A)

Figure 13 Level 2 info, with percentage assignment.

## 4.3. Duplicates

Underneath the previous table, the information on Duplicates is to be found:

- Total LEIs marked as duplicate: total number of LEI records of the LEI Issuer with a RegistrationStatus of DUPLICATE.
- Duplicate percentage of managed LEIs: total number of LEI records of the LEI Issuer with a RegistrationStatus of DUPLICATE / Total LEI records of LEI Issuer.

Duplicates	Values
Total LEIs marked as duplicate **	14 (N/A)
Duplicate percentage of managed LEIs	< 1 % (N/A)

Figure 14 Duplicates info, with percentage assignment.

## 4.4. Challenges

The 'Challenges' table shows a tabular representation of the statistics related to the challenges received by the LEI Issuer via GLEIF's central Challenge facility.

This table shows the following measurements. Note that any particular LEI could be transferred by the end of the assessment, this would not be taken into account in this section:

- Challenges this month: The challenges that were assigned to the LEI Issuer based on an LEI that was challenged.
- Duplicates found this month: Challenges that, after assessment by the LEI Issuer, resulted in an Exclusivity/Uniqueness violation via the challenge facility.
- Updates to entity information this month: Challenges that after assessment by the LEI Issuer, resulted in an update to the entity information for a particular LEI, via the challenge facility.

### In the LEI Issuer Data Quality Report

The tabular representation of the LEI Issuer Challenges, with respective percentage assignments, looks as follows:

Challenges	Values
Challenges this month	903 (> 100 %)
Duplicates found this month	63 (> 100 %)
Updates to entity information this month	96 (N/A)

Figure 15 LEI Issuer Challenges with trend arrow assignments..

## 4.5. Files

This table shows a tabular representation of the statistics related to the file availability by the LEI Issuer. It is a tabular representation similar to the one in the previous chapters.

This table shows the following measurements:

- Number of days with complete set of files (LEI-CDF, RR-CDF, RepEx) successfully uploaded during the month: The count of days in the month when the LEI Issuer managed to successfully upload at least one XML compliant file for each file type divided by the total days in the month.

### In the LEI Issuer Data Quality Report

The tabular representation of the File Statistics, with respective percentage assignment, will look as follows:

Files	Values
No. of days per month with CDF-compliant file uploads	30 / 30 (+/-0 %)

Figure 16 File Statistics with trend arrow assignments.