Enabling global identity
Protecting digital trust

GLEIF Data Quality Reports

Dictionary

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Table of Contents

Change History

This section records the history of all changes to this document.

Date	Version	Description of change	Author
2021-07-07	3.0	Consolidate “Global LEI Data Quality Report Dictionary v2.4” and “LEI Issuer Data Quality Report Dictionary v2.1” and change content to reflect new layout of the Data Quality Reports.	GLEIF

Terms and Definitions

Term	Definition
Common Data File format (CDF)	The Common Data File Formats (X-CDF) provide the specificity needed for the operational implementation of the ISO standard. The three CDF files that the Data Quality Reports are concerned with are: • LEI-CDF: Defines how Level 1 data, i.e., the information on ‘who is who’, is reported. • RR-CDF (Relationship-Record-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. • RepEx (Reporting Exceptions) format: If the child legal entity does not have any parent entities that fulfill GLEIF’s definition of consolidation or if the parent does not have an LEI, a reporting exception is used instead of a relationship record.
Data Quality Check	The definition of (series of) rules, usually in a form of if-then-else conditions, that a data record must fulfill in order to achieve certain data quality criteria and Maturity Levels.
(Data Quality) Check Failure	The result of a Data Quality Check in which an LEI Record Set does not fulfill the specified rules.
Global (Data Quality) Report	These reports demonstrate the overall level of data quality achieved in the Global LEI System.

LEI Issuer (Data Quality) Report	These reports analyze the level of data quality achieved by the individual LEI issuing organizations.
LEI Record Set	An XML data record in CDF format describing one Legal Entity, including its related relationship information.
ML	Maturity Level
MLS	Maturity Level (Quality) Score
TDQS	Total Data Quality Score

1 Introduction

This document gives detailed insights into the components used on GLEIF's Monthly Data Quality Reports. In this document the LEI Issuer Data Quality Report as well as the Global Data Quality Report are addressed.

1.1 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.

Quality Criterion	Definition
Accuracy	The extent to which the data is 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 or the degree the data correctly represents the truth about a real-world object
Accessibility	The extent to which 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 is up-to-date; a datum value is up-to-date if it is current for a specific point in time, and it is outdated if it was current at a preceding time but 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 / concept of data quality that involves whether the data is up-to-date and available within a useful time frame; timeliness is determined by manner and context in which the data is being used
Uniqueness	The extent to which all distinct values of a data element 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)

1.2 Data Quality Checks

GLEIF's Data Quality Checks ensure that the provided reference data is complying with the current State Transition and Validation Rules in the Global LEI System. These checks have been defined based on the Common Data File (CDF) formats. Each Data Quality Check is characterized by a Maturity Level, Quality Criterion, intention and a formalized description containing precondition and condition.

The set of all checks constitutes the so-called Rule Setting. Each check is of type "If X then Y", where "X" is described as the "check precondition" and "Y" is the "check condition". If a record, relationship or reporting exception does not pass the check's "precondition", this check is "not applicable". If it passes the precondition, the record proceeds to the condition. If the data does not fulfill the condition "Y", the check is considered a "fail", otherwise, the check is considered a "pass".

Each Data Quality Check can be specified by 3 elements÷

- Intention: The intention is written in plain language and summarizes the purpose of a given Data Quality Check.
- Precondition: The precondition of each check filters out those LEI Records that are not in scope for a given check. Not every Data Quality Check is applicable for all LEI Records. For example, some Data Quality Checks are only applicable for fund entities.
- Condition: In every Data Quality Check certain unambiguous fail-conditions are implemented. The condition is only applied to LEI Records that passed the precondition of a given Data Quality Check.

1.3 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, the next highest Maturity Levels can only be reached 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 achieved for 100 percent for all records)
- Level 3: 'Excellent Quality' (the higher, the better)

Note: On GLEIF's Data Quality Reports, Maturity Level 0 has been introduced. This Maturity Level is not been assigned to any Data Quality Check. On the Global Report, the sole purpose of the label "Maturity Level 0" is to highlight the number of LEI Issuers that did not reach any of the aforementioned Maturity Levels. With respect to the LEI Issuer Report, the label "Maturity Level 0" is used to highlight the number of days the respective LEI Issuer has not achieved any Maturity Level.

2 General Calculations

The following principles apply to all calculations on the Data Quality Reports, if not stated otherwise:

1. Only Data Quality Checks with tag "Report" are considered.
2. The underlying data regarding check failures is based on the daily Data Quality Check results that all LEI Issuers receive on a daily basis.
3. All statistics on the LEI population are derived from the concatenated source files, whereas discrepancies caused by upload failures are automatically amended.
4. All statistics related to challenges are derived from the underlying database managing the LEI data challenges.
5. On LEI Issuer Reports, only Record Sets are considered whose RegistrationStatus is not PENDING_ARCHIVAL.
6. All calculations are based on daily data.

2.1 Total Data Quality Score

The Total Data Quality Score (TDQS) is the weighted average of the individual Maturity Level scores. The Total Data Quality Score is based on a two-step procedure:

$$MLS_j = \frac{\sum_{i=1}^{I} q_{i \mid j}}{I}$$

Where:

- MLS (Maturity Level Score) denotes the data quality score for a single Maturity Level.
- j denotes an index representing the j^{th} Maturity Level.

- $q_{i \mid j}$ denotes the i^{th} check result for the respective Maturity Level j:

$$q_i \begin{cases} 1, if\ check\ is\ "PASS" \\ 0, if\ check\ is\ "FAIL" \end{cases}$$

- I denotes the total number of passed and failed Data Quality Check results for the given Maturity Level. Data Quality Checks with result “NOT APPLICABLE” are not considered.

Based on the Maturity Level Score (MLS), the Total Data Quality Score is calculated as follows:

$$TDQS = \sum_{j=1}^{J} W_j \times MLS_j$$

Where:

- $TDQS$ denotes the Total Data Quality Score.
- j denotes an index representing the j^{th} Maturity Level.
- J denotes the total number of Maturity Levels.
- W_j denotes the weight for each respective Maturity Level. The weights may take the following values:

$$W_j \begin{cases} 0.16\ for\ Maturity\ Level\ 1 \\ 0.34\ for\ Maturity\ Level\ 2 \\ 0.50\ for\ Maturity\ Level\ 3 \end{cases}$$

- MLS_j denotes the Maturity Level score for each respective Maturity Level derived from the first equation.

The largest weights in the weight matrix W_j are assigned to Maturity Level 3, followed by Maturity Level 2. Therefore, Data Quality Checks that are assigned to one of these Maturity Levels have a larger influence on the Total Data Quality Score than Data Quality Checks assigned to Maturity Level 1.

2.2 Total Data Quality Score for Quality Criteria

The Total Data Quality Score for Quality Criteria is defined analogously to the method described in the previous chapter. First, the respective check results are filtered based on the Quality Criterion. Afterward, the two-step approach described in the previous paragraph is applied. The weights for each Maturity Level are adjusted depending on the existence of Data Quality Checks for a given Maturity Level. If for a given Quality Criterion not all Maturity Levels are covered by at least one Data Quality Check, the weights are proportionally transformed. These transformed weights are rounded to two decimal places.

Example: If Maturity Level 3 is missing, the following equation to calculate the adjusted weight for Maturity Level 1 is carried out: $W_{ML1} = \frac{W_{ML1}}{1-W_{ML3}}$.

The below table showcases all possible scenarios and the respective adjusted weights for the current definition of Maturity Levels:

Possible combinations	Weights
ML1; ML2; ML3	$W_{ML1} = 0.16$; $W_{ML2} = 0.34$; $W_{ML3} = 0.5$
ML1; ML2	$W_{ML1} = 0.32$; $W_{ML2} = 0.68$
ML1; ML3	$W_{ML1} = 0.24$; $W_{ML3} = 0.76$
ML2; ML3	$W_{ML2} = 0.4$; $W_{ML3} = 0.6$
ML1	$W_{ML1} = 1$
ML2	$W_{ML2} = 1$
ML3	$W_{ML3} = 1$

Example 1:

The Quality Criterion "Validity" consists of 15 checks. Eight checks belong to Maturity Level 1, seven checks belong to Maturity Level 2 and zero checks belong to Maturity Level 3. Hence, the adjusted weights $W_{ML1} = 0.32$ and $W_{ML2} = 0.68$ are applicable for the given Quality Criterion.

Example 2:

The Quality Criterion "Completeness" consists of three checks. All three checks belong to Maturity Level 2. Zero checks belong to Maturity Level 1 or Maturity Level 3. Hence, the adjusted weight $W_{ML2} = 1$ is applicable for the given Quality Criterion.

Example 3:

The Quality Criterion "Consistency" consists of 21 checks. 16 checks belong to Maturity Level 1, two checks belong to Maturity Level 2 and three checks belong to Maturity Level 3. Hence, the unaltered weights $W_{ML1} = 0.16$, $W_{ML2} = 0.34$ and $W_{ML3} = 0.5$ are applicable for the given Quality Criterion.

3 Report Components

Each section of the Data Quality Report focuses on different aspects. It is ensured that each parameter is displayed in relation to previous reporting periods. If in the previous reporting period the respective value was “0”, the difference compared to the previous reporting period is displayed as “(-)”. The same applies for new LEI Issuers for which no data exists for the previous reporting period.

3.1 Key Metrics

The key metrics component consists of three subcomponents:

- Average Total Data Quality Score (please see 3.1.1)
- LEI Issuers Reaching Maturity Level 2 (please see 3.1.2 and 3.1.3)
- Average Days to Close a Challenge (please see 3.1.4)

Figure 1: Screenshot Key Metrics

All three statistics summarize other components of the report. The green and red arrows indicate whether the change compared to the previous reporting period is positive or negative. A positive trend regarding the Total Data Quality Score and the number of LEI Issuers Reaching Maturity Level 2 is equitable to an increase of these values, while for the Average Days to Close a Challenge, a positive trend is equitable to a decreasing value. The yellow circle indicates that no change occurred compared to the previous reporting period.

3.1.1 Average Total Data Quality Score (TDQS) [Global & LEI Issuer Report]

The Average Total Data Quality Score component displays the average of the Total Data Quality Score for the given reporting period:

$$\overline{TDQS} = \frac{\sum_{d=1}^{D} TDQS_d}{D}$$

Where:

- $\overline{TDQS}$ denotes the Average Total Data Quality Score.
- $TDQS_d$ denotes the TDQS on the d^{th} day.
- D denotes the total number of days within the given time period.

The comparative figure is calculated as absolute change to the previous month.

3.1.2 LEI Issuers Reaching Maturity Level 2 [Global Report]

The Global Data Quality Report shows the share of LEI Issuers reaching Maturity Level 2 in the given period. The comparative figure is calculated as the absolute change to the previous month. For further details on the calculation method please see 3.5.

3.1.3 Days, LEI Issuer Reaching Maturity Level 2 [LEI Issuer Report]

The LEI Issuer Data Quality Report shows the percentage of days on which the respective LEI Issuer reached Maturity Level 2 throughout the reporting period. The comparative figure is calculated as the absolute change to the previous month. For further details on the calculation method please see 3.4.

3.1.4 Average Days to Close a Challenge [Global & LEI Issuer Report]

The average days to close a challenge is taken from the “Challenges” section in the statistics table. For details on the calculation methods please see 3.10.4.

3.2 Maturity Level Trend [LEI Issuer Report]

This component is only present on the LEI Issuer Reports and replaces the summary text of the Global Report.

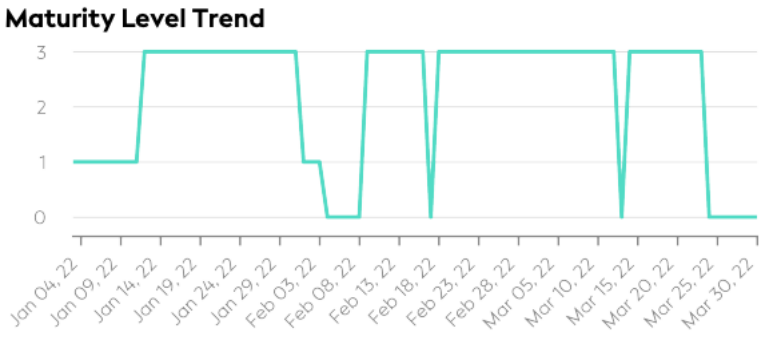

Figure 2: Maturity Level Trend

The Maturity Level Trend visualizes the daily achieved Maturity Level for the respective LEI Issuer for the current and the two previous reporting periods. The achieved Maturity Level is determined by the Data Quality Check failure with the lowest assigned Maturity Level. The Maturity Level (ML) is defined for each day as follows:

$$ML_d \begin{cases} 0, if\ at\ least\ one\ ML1\ Check\ Failure\ occurred \\ 1, if\ no\ ML1\ Check\ Failure\ occurred, and\ at\ least\ one\ ML2\ Check\ Failure\ occurred \\ 2, if\ no\ ML1\ and\ no\ ML2\ Check\ Failure\ occurred, and\ at\ least\ one\ ML3\ Check\ Failure\ occurred \\ 3, if\ no\ Data\ Quality\ Check\ Failure\ occurred \end{cases}$$

Where ML_d denotes the Maturity Level for a given day.

Example 1:

An LEI issuer has three Check Failures for a given day. All three check results belong to checks assigned to Maturity Level 2. Hence, the LEI Issuer reaches Maturity Level 1 on that day.

Example 2:

An LEI issuer has two Check Failures for a given day. One check result belongs to Maturity Level 3 check and one check result belongs to a Maturity Level 2 check. Hence, the LEI issuer reaches Maturity Level 1.

Example 3:

An LEI issuer has one Check Failure for a given day. The failing check belongs to Maturity Level 1. Hence, the LEI issuer does not reach any Maturity Level and the report exhibits Maturity Level 0.

3.3 Total Data Quality Score Trend [Global & LEI Issuer Report]

The Total Data Quality Score Trend shows the Total Data Quality Score for each day of the two previous and the current reporting period. On the LEI Issuer Report two lines are visible. The dotted line shows the global Total Data Quality Score, the light blue line provides the Total Data Quality Score of the respective LEI Issuer.

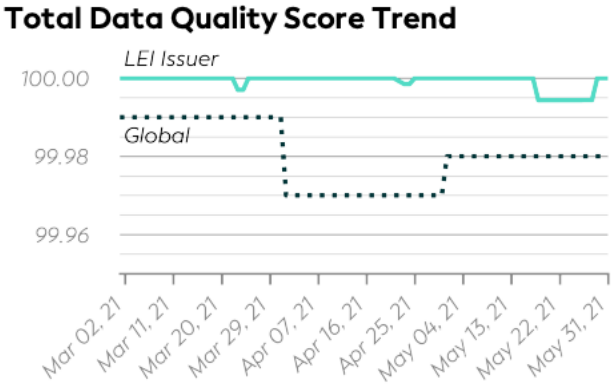

Figure 3: Total Data Quality Score Trend – LEI Issuer Report

Detailed information regarding the calculation of the Total Data Quality Score can be found in chapter 2.1.

3.4 Maturity Level Performance [LEI Issuer Report]

The Maturity Level Performance is calculated in two steps. The first step serves as input for the LEI Issuer Report, the second step serves as input for the Global Data Quality Report. The LEI Issuer Report displays the number of days an LEI Issuer has reached the respective Maturity Level. This parameter is displayed for the current reporting period as well as for the two previous reporting periods.

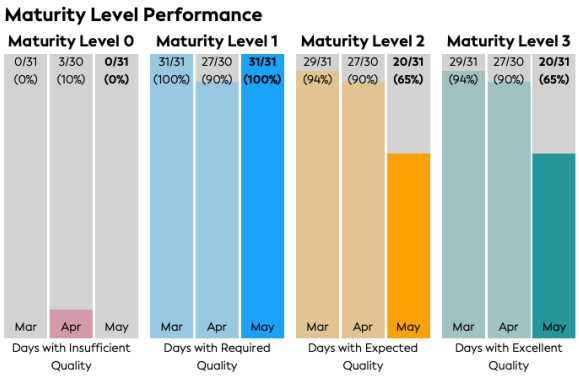

Figure 4: Maturity Level Performance – LEI Issuer Report

The Maturity Level (ML) is defined for each day as follows:

$$ML_d \begin{cases} 0, if\ at\ least\ one\ ML1\ Check\ Failure\ occurred \\ 1, if\ no\ ML1\ Check\ Failure\ occurred, and\ at\ least\ one\ ML2\ Check\ Failure\ occurred \\ 2, if\ no\ ML1\ and\ no\ ML2\ Check\ Failure\ occurred, and\ at\ least\ one\ ML3\ Check\ Failure\ occurred \\ 3, if\ no\ Data\ Quality\ Check\ Failure\ occurred \end{cases}$$

Where ML_d denotes the Maturity Level for a given day.

On the LEI Issuer Report the number of days a certain Maturity Level has been reached is shown. The number of days a given LEI issuer reaches a specific Maturity Level is defined as follows:

$$ML_{D\,|\,x} = \sum_{d=1}^{D} ML_{d\,|\,x}$$

Where:

- $ML_{D\,|\,x}$ denotes the number of days the respective Maturity Level has been reached within the time period of D days.
- $ML_{d\,|\,x}$ denotes whether the respective Maturity Level for the given day d has been reached.

- $ML_{d \mid x} \begin{cases} 0, if\ x\ does\ not\ equal\ the\ given\ Maturity\ Level \\ 1, if\ x\ equals\ the\ given\ Maturity\ Level \end{cases}$
- d denotes the index representing a single day.
- D denotes the total number of days in the given time period.

3.5 Maturity Level Performance [Global Report]

Based on the calculations conducted in the previous chapter for the LEI Issuer Report, the Maturity Level Performance of the Global Data Quality Report is calculated. The Global Data Quality Report showcases the number of LEI Issuers that have achieved the respective Maturity Levels on 75% of the days within the reporting period. This metric is shown for the current reporting period and the 2 previous periods.

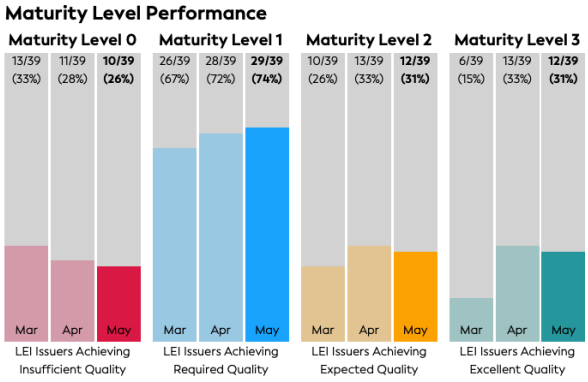

Figure 5: Maturity Level Performance – Global Report

To create the statistics shown in Figure 5 above, the daily result for each LEI Issuer is arranged in descending order. Based on the nearest-rank method, the Maturity Level is determined:

$$n = \left\lceil \frac{P}{100} \times D \right\rceil$$

Where:

- n denotes the index indicating the achieved Maturity Level in the descending ordered series.
- P denotes the 75-th percentile.
- D denotes the total number of days in the given time period.

Example 1:

An LEI Issuer reaches the following Maturity Levels in a ten-day period: 1 2 3 3 3 1 1 2 2 1. In the first step, the values are arranged in descending order: 3 3 3 2 2 2 1 **1** 1 1. Afterward, the index of the 75-th percentile is determined: $n = \left\lceil \frac{P}{100} \times D \right\rceil = \left\lceil \frac{75}{100} \times 10 \right\rceil = 7.5$. The value is then rounded to 8. The 8-th value in the ordered list of Maturity Levels equals 1 (highlighted in red color and bold above). Therefore, the Maturity Level for the given ten-day period is 1.

3.6 Top 5 Failing Checks [LEI Issuer Report]

The section Top 5 Failing Checks on the LEI Issuer Report displays the five Data Quality Checks with the highest number of check failures throughout the reporting period. Furthermore, the Maturity Level and Quality Criterion of the respective checks are shown. The table does not show the specific version of the affected Data Quality Checks to take into account the possibility of minor check updates during the reporting period. Therefore, "C000xxx:3.0.0" and "C000xxx:3.0.1" are both considered to be "C000xxx".

Top 5 Failing Checks

Check ID	Avg. Number of Check Failures	Maturity Level	Quality Criterion
C000291	5 (-37.50%)	Expected	Consistency
C000180	3 (-)	Expected	Uniqueness
C000243	<1 (-83.87%)	Expected	Completeness
C000245	<1 (-)	Required	Consistency
N/A	- (-)	-	-

Figure 6: Top 5 Failing Checks – LEI Issuer Report

The average number of check failures is defined as:

$$\overline{F_C} = \frac{\sum_{d=1}^{D} F_{C \mid d}}{D}$$

Where:

- $\overline{F_c}$ denotes the average number of Data Quality Check Failures for a given time period with D days for a given Data Quality Check C.
- D denotes the total number of days in the given time period.
- d denotes the index representing a single day.
- $F_{C \mid d}$ denotes the number of failed records for a given check C for a given day d.

The average number of Data Quality Check Failures is then rounded to the nearest integer. No rounding is applied if the average number of Data Quality Check Failures is smaller than 1. The percentual change per average number of check failures is calculated as the percentual change compared to the previous reporting period:

$$\mathrm{PC} = \frac{F_{C \mid t0} - F_{C \mid t-1}}{F_{C \mid t-1}} \times 100$$

Where:

- PC denotes percentual change between the two time periods $t0$ and $t-1$.
- $F_{C \mid t0}$ denotes the total number of Data Quality Check Failures for the given time period.
- $F_{C \mid t-1}$ denotes the total number of Data Quality Check Failures for the previous time period.

Note: If $F_{C \mid t-1}$ equals zero, the equation is not solvable and "NA" is displayed on the report.

3.7 Top 5 Failing Checks [Global Report]

The section Top 5 Failing Checks on the Global Data Quality Report applies the same calculation method for the average number of check failures as the LEI Issuer Report, which is described in the previous chapter 3.6. In contrast to the LEI Issuer Report, the Global Data Quality Report highlights the number of LEI Issuers that are managing at least one of the LEI Records failing the affected Data Quality Checks. Furthermore, the LEI Issuer with the highest failure ratio per affected Data Quality Check is shown.

Top 5 Failing Checks

Check ID	Avg. Number of Check Failures	No. of LEI Issuers	LEI Issuers with Highest Failure Ratio
C000291	1,133 (-55.81%)	22	
C000243	748 (-42.77%)	23	
C000304	535 (+5.52%)	2	
C000289	393 (-36.92%)	10	
C000288	255 (-54.30%)	11	

Figure 7: Top 5 Failing Checks – Global Report

The LEI issuer with the highest failure rate per affected Data Quality Check is identified by calculating the ratio between the number of Data Quality Check Failures and the number of managed LEI Records:

$$I = \max\left\{ f(i): \frac{\sum_{d=1}^{D} F_{C \mid i \wedge d}}{\sum_{d=1}^{D} R_{i \wedge d}} \right\}$$

Where:

- I denotes the maximum failure ratio.
- $F_{C \mid i \wedge d}$ denotes the number of Check Failures for the given Data Quality Check for the given LEI issuer in the given time period.

- $R_{i \wedge d}$ denotes the total number of records for the given LEI issuer on the given day d.
- D denotes the total number of days in the given time period.
- d denotes the index representing a single day.

3.8 Data Quality World Map [Global & LEI Issuer Report]

The Data Quality World Map shows the Average Total Data Quality Score for each country throughout the reporting period. The country is determined by the LegalAddress/Country field.

Figure 8: Data Quality World Map

The Total Data Quality Score of each country is calculated as follows:

$$TDQS_c = \frac{\sum_{i=1}^{I} TDQS_{i \mid c}}{N_{i \mid c}}$$

Where:

- $TDQS_c$ denotes the Total Data Quality Score for a given country c.
- $TDQS_{i \mid c}$ denotes the Total Data Quality Score for a given LEI Issuer i in a given country c.
- $N_{i \mid c}$ denotes the number of LEI Issuers that issue LEIs for the given country. On the LEI Issuer Report this value equals 1.

3.9 Data Quality Criteria [Global & LEI issuer report]

The Data Quality Criteria table breaks down the results of GLEIF's Data Quality Checks by Quality Criteria. "(No. of Checks)" per Quality Criterion displays the number of Data Quality Checks that are been part of the corresponding Rule Setting with tag "Report". If all Data Quality Checks of a Quality Criterion are "NOT APPLICABLE", no trend line is shown. In that case "No. of Checks" indicates the number of existing checks for the Quality Criterion irrespective of the check result.

The Data Quality Score Trend shows the daily Total Data Quality Score for the given time period and the two previous time periods (blue line) as described in 2.2. On the Global Data Quality report, the grey horizontal line visualizes the Average Total Data Quality Score of the current and previous two reporting periods as displayed in the column “Avg. DQS”. On the LEI Issuer Report, the grey horizontal line shows the Average Total Data Quality Score of the respective LEI Issuer for each Quality Criterion. The calculation of the Average Total Data Quality Score $\overline{TDQS}$ is described in 3.1.1.

Data Quality Criteria

Quality Criterion (No. of Checks)	Data Quality Score (DQS) Trend (Mar - May)	Avg. DQS	Avg. Number of Check Failures
Accessibility (0)		-	- (-)
Accuracy (4)		99.99	<1 (<0.01%)
Completeness (5)		99.97	1,395 (0.01%)
Comprehensiveness (2)		99.99	5 (<0.01%)
Consistency (18)		99.97	1,306 (<0.01%)
Currency (1)		99.99	<1 (<0.01%)
Integrity (21)		99.99	5 (<0.01%)
Provenance (1)		99.99	66 (<0.01%)
Representation (2)		100.00	0 (0.00%)
Timeliness (0)		-	- (-)
Uniqueness (5)		99.82	374 (<0.01%)
Validity (12)		99.98	591 (<0.01%)

Figure 9: Data Quality Criteria

The “Average number of Check Failures” displays the average of check failures for the respective Quality Criterion. This is calculated as follows:

$$\overline{F_{QC}} = \frac{\sum_{d=1}^{D} F_{QC \mid d}}{D}$$

Where:

- $\overline{F_{QC}}$ denotes the average Check Failures for a given Quality Criterion QC within a given time period of D days.
- D denotes the total number of days in the given time period.
- d denotes the index representing a single day.
- $F_{QC \mid d}$ denotes the number of Check Failures for a given Quality Criterion QC for a given day d.

3.10 Statistics [Global & LEI Issuer Report]

The statistics section provides a general overview of the underlying LEI reference data. All values in this table are based on the last day of the reporting period. For each parameter the percentual change compared to the previous reporting period is shown. LEI Records that are undergoing the transfer process on the last day of the reporting period are only counted once on the Global Report. For the LEI Issuer Report only LEI Records are considered that are not using RegistrationStatus PENDING_ARCHIVAL on the last day of the reporting period. For some of the metrics additional filters are applied as described in the upcoming chapters.

Please note that on the LEI Issuer Report the value for “LEI Issuer” is not included. By way of contrast, the value for “No. of days with CDF-compliant file uploads“ is not shown on the Global Data Quality Report.

Statistics

Totals	Values
Total LEI Records	1,876,831 (+1.01%)
Active Entities Managed	1,801,194 (-)
New Issued LEIs	18,826 (+0.44%)
Renewed LEIs	59,221 (-93.69%)
Lapsed LEIs	613,398 (> +1,000%)
Countries	226 (-0.44%)
LEI Issuers	39 (+/-0.00%)
LEIs with	**Values**
Parent Relationships	123,950 (-7.52%)
Complete Parent Information	1,684,752 (+2.74%)
Fund Relationships	- (-)
Marked Duplicates	**Values**
Total LEIs	4,838 (+0.54%)
Total LEIs in Percentage	<1% (-0.46%)
New Marked LEIs	26 (-36.59%)
Challenges	**Values**
New Challenges	349 (-14.67%)
Closed Challenges	372 (-1.85%)
Closed Challenges with Update	246 (+3.36%)
Avg. Days to Close a Challenge	3 (-11.74%)

Figure 10: Statistics – Global Report

3.10.1 Totals [Global & LEI Issuer Report]

This section contains fundamental statistics of the underlying reference data.

3.10.1.1 Total LEI Records [Global & LEI Issuer Report]

The Total LEI Records statistic describes the distinct count of LEI Records on the last day of the reporting period.

3.10.1.2 Active Entities Managed [Global & LEI Issuer Report]

The Active Entities Managed statistic describes the number of LEI Records having EntityStatus ACTIVE while not having RegistrationStatus DUPLICATE or ANNULLED.

3.10.1.3 New Issued LEIs [Global & LEI Issuer Report]

The New Issued LEIs statistic describes the number of LEI Records that have not existed in the Global LEI Index in the previous reporting period.

3.10.1.4 Renewed LEIs [Global & LEI Issuer Report]

The Renewed LEIs statistic describes the number of LEI Records whose NextRenewalDate is later compared to the previous reporting period. If the LEI Record did not exist in the previous reporting period yet, this LEI Record is not considered to be renewed and will be counted as “New Issued LEI” instead. On the LEI Issuer Reports, records that are transferred in from another LEI Issuer are counted as renewed LEIs if the NextRenewalDate in the current reporting period is larger compared to the previous reporting period and if both LEI Issuers have correctly followed the transfer protocol as described in GLEIF’s State Transition and Validation Rules for Common Data File formats.

3.10.1.5 Lapsed LEIs [Global & LEI Issuer Report]

The Lapsed LEIs statistic describes the number of LEIs with RegistrationStatus LAPSED.

3.10.1.6 Countries [Global & LEI Issuer Report]

The Countries statistic describes the number of countries in which at least one LEI Record with any RegistrationStatus except DUPLICATE and ANNULLED exists. The country in this statistic is determined by the LegalAddress/Country field.

3.10.1.7 LEI Issuer [Global Report]

The LEI Issuer statistic describes the number of LEI Issuers that uploaded at least one CDF compliant file within the given time period.

3.10.2 Relationship Information [Global & LEI Issuer Report]

For each LEI Record the LEI Issuers are expected to provide information regarding the direct and ultimate parent of a legal entity. This information can either be provided by reporting relationship records or by including reporting exceptions. This section monitors the usage of such relationship information.

3.10.2.1 LEIs with Relationships [Global & LEI Issuer Report]

The LEIs with Relationships statistic describes the number of LEI Records for which at least one parent entity is reported by a relationship record. Only relationship records with RegistrationStatus PUBLISHED or LAPSED are taken into account. Furthermore, this metric only considers relationship records of type IS_DIRECTLY_CONSOLIDATED_BY, IS_ULTIMATELY_CONSOLIDATED_BY and IS_INTERNATIONAL_BRANCH_OF. Reporting exceptions are not considered.

3.10.2.2 LEIs with Complete Parent Information [Global & LEI issuer report]

The LEIs with Complete Parent Information statistic describes the number of LEI Records that report a complete set of parent information. The below table shows the level 2 information that is considered to be complete for non-branch LEI Records. Only relationships with RegistrationStatus LAPSED or PUBLISHED are considered.

Direct Parent	Ultimate Parent
Relationship record	Relationship record
Relationship record	Reporting exception
Reporting exception	Relationship record
Reporting exception	Reporting exception

In case the LEI Record has EntityCategory BRANCH, only one relationship of type IS_INTERNATIONAL_BRANCH_OF with RegistrationStatus PUBLISHED or LAPSED must be present so that the LEI Record is considered to have complete parent information.

3.10.3 Marked Duplicates [Global & LEI Issuer Report]

Each LEI Record must be unique. If a duplicate LEI Record is identified, this record is marked with RegistrationStatus DUPLICATE and is retained in the Global LEI Index. This section highlights the identification and prevalence of such duplicate records.

3.10.3.1 Total LEIs [Global & LEI Issuer Report]

The Total LEIs statistic in this section describes the number of LEI Records with RegistrationStatus DUPLICATE.

3.10.3.2 Total LEIs in Percentage [Global & LEI Issuer Report]

On the Global Report, the Total LEIs in Percentage statistic describes the number of LEI Records with RegistrationStatus DUPLICATE divided by the number of total LEI Records on the last day of the report. On the LEI Issuer Report, the number of LEIs with RegistrationStatus DUPLICATE is divided by the number of LEIs managed by the respective LEI Issuer.

3.10.3.3 New Marked LEIs [Global & LEI Issuer Report]

The New Marked LEIs statistic describes the increase of LEI Records with RegistrationStatus DUPLICATE compared to the last day of the previous reporting period.

3.10.4 Challenges [Global & LEI Issuer Report]

GLEIF's challenge facility enables all interested parties to challenge the reference data of any LEI Record. This section displays the current status of these challenges.

3.10.4.1 New Challenges [Global & LEI Issuer Report]

The New Challenges statistic describes the number of new challenges that have been created throughout the reporting period via GLEIF's challenge facility.

3.10.4.2 Closed Challenges [Global & LEI Issuer Report]

The Closed Challenges statistic describes the number of challenges that have been closed throughout the reporting period. The percentual change is calculated in comparison to the result of the previous time period.

3.10.4.3 Closed Challenges with Update [Global & LEI issuer report]

The Closed Challenges with Update statistic describes the number of challenges that have been closed throughout the reporting period, and, based on the assessment by the respective LEI Issuer, resulted in an update of the entity information of the challenged LEI Record.

3.10.4.4 Avg. Days to Close a Challenge [Global & LEI issuer report]

The Avg. Days to Close a Challenge statistic describes the average number of days it took to close a challenge. All challenges that have been closed during the reporting period are in scope for this metric. The number of days is calculated as the difference between the opening and the closing day. Challenges closed within one day are counted as 0. If the total average is smaller than 1 "<1" is displayed.

3.10.5 Files [LEI Issuer Report]

Every LEI Issuer is required to upload at least one CDF-compliant file for each type (LEI-CDF, RR-CDF, RepEx). This section displays the LEI Issuers' upload behavior for these files.

3.10.5.1 No. of Days with CDF-Compliant File Uploads

The No. of Days with CDF-Compliant File Uploads statistic describes the number of days on which the LEI Issuer has successfully uploaded at least one CDF-compliant file for each file type.