

COMMISSION IMPLEMENTING REGULATION (EU) 2021/2224**of 16 November 2021****laying down the details of the automated data quality control mechanisms and procedures, the common data quality indicators and the minimum quality standards for storage of data, pursuant to Article 37(4) of Regulation (EU) 2019/818 of the European Parliament and of the Council**

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EU) 2019/818 of the European Parliament and of the Council of 20 May 2019 on establishing a framework for interoperability between EU information systems in the field of police and judicial cooperation, asylum and migration and amending Regulations (EU) 2018/1726, (EU) 2018/1862 and (EU) 2019/816 ⁽¹⁾, and in particular Article 37(4) thereof,

Whereas:

- (1) Regulation (EU) 2019/818, together with Regulation (EU) 2019/817 of the European Parliament and of the Council ⁽²⁾ establishes a framework to ensure interoperability between the EU information systems in the field of borders, visa, police and judicial cooperation, asylum and migration.
- (2) In order to improve data quality and harmonise the quality requirements, it is necessary to lay down the details of the automated data quality control mechanisms and procedures, the common data quality indicators and the minimum quality standards for the data entered and stored in the underlying EU information systems, the shared biometric matching service and the common identity repository.
- (3) Those measures should be implemented and assessed by the European Union Agency for the Operational Management of Large-Scale IT Systems in the Area of Freedom, Security and Justice (eu-LISA) taking into consideration the specific provisions laid down for each EU information system and the interoperability component. To perform these tasks, eu-LISA should be advised by experts from the Commission, the Member States and the Union agencies using the EU information systems and interoperability components.
- (4) Data quality control mechanisms and procedures should determine the compliance of the input data with the blocking and soft rules applicable to the underlying EU information systems, the shared biometric matching service and the common identity repository. eu-LISA should be responsible for ensuring that the data quality rules remain appropriate for achieving the objectives of the EU information systems and the interoperability components.
- (5) For each quality control indicator, eu-LISA should determine and assess the appropriateness of the minimum quality standard indispensable to store the data in the EU information systems and the interoperability components. Data quality standards should enable the automatic identification of apparently incorrect or inconsistent data submissions, so that the originating Member State is able to verify the data and carry out any necessary remedial action.

⁽¹⁾ OJ L 135, 22.5.2019, p. 85.

⁽²⁾ Regulation (EU) 2019/817 of the European Parliament and of the Council of 20 May 2019 on establishing a framework for interoperability between EU information systems in the field of borders and visa and amending Regulations (EC) No 767/2008, (EU) 2016/399, (EU) 2017/2226, (EU) 2018/1240, (EU) 2018/1726 and (EU) 2018/1861 of the European Parliament and of the Council and Council Decisions 2004/512/EC and 2008/633/JHA (OJ L 135, 22.5.2019, p. 27).

- (6) The data cleaning and issue detection mechanisms should be established in order to regularly check the validity and compliance of the data stored in the underlying EU information systems and the interoperability components with the data quality standards.
- (7) eu-LISA should ensure a central monitoring capacity for data quality and for producing reports on data quality on a regular basis to the Member States. These reports should be produced by the central repository for reporting and statistics in accordance with Article 39(1) of Regulation (EU) 2019/818 and the rules laid down in the Commission Delegated Regulation 2021/2222 ⁽³⁾.
- (8) Given that Regulation (EU) 2019/818 builds upon the Schengen *acquis*, in accordance with Article 4 of Protocol No 22 on the Position of Denmark, annexed to the Treaty on European Union and to the Treaty on the Functioning of the European Union, Denmark notified the implementation of Regulation (EU) 2019/818 in its national law. It is therefore bound by this Regulation.
- (9) This Regulation constitutes a development of the provisions of the Schengen *acquis* in which Ireland does not take part ⁽⁴⁾. Ireland is therefore not taking part in the adoption of this Regulation and is not bound by it or subject to its application.
- (10) As regards Iceland and Norway, this Regulation constitutes a development of the provisions of the Schengen *acquis* within the meaning of the Agreement concluded by the Council of the European Union and the Republic of Iceland and the Kingdom of Norway concerning the association of those two States with the implementation, application and development of the Schengen *acquis* ⁽⁵⁾, which fall within the area referred to in Article 1, point A of Council Decision 1999/437/EC ⁽⁶⁾.
- (11) As regards Switzerland, this Regulation constitutes a development of the provisions of the Schengen *acquis* within the meaning of the Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen *acquis* ⁽⁷⁾, which fall within the area referred to in Article 1, point A of Decision 1999/437/EC, read in conjunction with Article 3 of Council Decision 2008/146/EC ⁽⁸⁾.
- (12) As regards Liechtenstein, this Regulation constitutes a development of the provisions of the Schengen *acquis* within the meaning of the Protocol between the European Union, the European Community, the Swiss Confederation and the Principality of Liechtenstein on the accession of the Principality of Liechtenstein to the Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen *acquis* ⁽⁹⁾ which fall within the area referred to in Article 1, point A of Decision 1999/437/EC read in conjunction with Article 3 of Council Decision 2011/350/EU ⁽¹⁰⁾.

⁽³⁾ Commission Delegated Regulation 2021/2222 of 30 September 2021 supplementing Regulation (EU) 2019/818 of the European Parliament and of the Council with detailed rules on the operation of the central repository for reporting and statistics. (See page 1 of this Official Journal).

⁽⁴⁾ This Regulation falls outside the scope of the measures provided for in Council Decision 2002/192/EC of 28 February 2002 concerning Ireland's request to take part in some of the provisions of the Schengen *acquis* (OJ L 64, 7.3.2002, p. 20).

⁽⁵⁾ OJ L 176, 10.7.1999, p. 36.

⁽⁶⁾ Council Decision 1999/437/EC of 17 May 1999 on certain arrangements for the application of the Agreement concluded by the Council of the European Union and the Republic of Iceland and the Kingdom of Norway concerning the association of those two States with the implementation, application and development of the Schengen *acquis* (OJ L 176, 10.7.1999, p. 31).

⁽⁷⁾ OJ L 53, 27.2.2008, p. 52.

⁽⁸⁾ Council Decision 2008/146/EC of 28 January 2008 on the conclusion, on behalf of the European Community, of the Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen *acquis* (OJ L 53, 27.2.2008, p. 1).

⁽⁹⁾ OJ L 160, 18.6.2011, p. 21.

⁽¹⁰⁾ Council Decision 2011/350/EU of 7 March 2011 on the conclusion, on behalf of the European Union, of the Protocol between the European Union, the European Community, the Swiss Confederation and the Principality of Liechtenstein on the accession of the Principality of Liechtenstein to the Agreement between the European Union, the European Community and the Swiss Confederation on the Swiss Confederation's association with the implementation, application and development of the Schengen *acquis*, relating to the abolition of checks at internal borders and movement of persons (OJ L 160, 18.6.2011, p. 19).

- (13) As regards Cyprus, Bulgaria and Romania and Croatia, this Regulation constitutes an act building upon, or otherwise relating to, the Schengen *acquis* within, respectively, the meaning of Article 3(1) of the 2003 Act of Accession, Article 4(1) of the 2005 Act of Accession and Article 4(1) of the 2011 Act of Accession.
- (14) The European Data Protection Supervisor was consulted in accordance with Article 42(1) of Regulation (EU) 2018/1725 of the European Parliament and of the Council ⁽¹⁾ and delivered an opinion on 30 April 2021.
- (15) The measures provided for in this Regulation are in accordance with the opinion of the Interoperability Committee,

HAS ADOPTED THIS REGULATION:

Article 1

Scope and subject matter

1. This Regulation lays down the details of the automated data quality control mechanisms and procedures on the data stored in the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818.
2. This Regulation also lays down details concerning the common data quality indicators and the minimum quality standards for storage of data, in particular regarding biometric data, in the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818.
3. The measures referred to in paragraphs 2 and 3 are without prejudice to any specific provisions concerning data quality related to the EU information systems laid down in Union law.
4. This Regulation applies to the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818.

Article 2

Definitions

For the purposes of this Regulation, the following definitions apply:

- (a) 'input data' means data, subject to data quality checks for the purpose of being stored in a EU information system or interoperability component referred to in Article 37(1) of Regulation (EU) 2019/818;
- (b) 'data cleaning mechanism' means a mechanism carrying out checks in order to ensure the scheduled erasure of data stored in a EU information system or interoperability component in accordance with Union law;
- (c) 'issue detection mechanism' means a mechanism carrying out checks in order to identify data that does not meet the data quality rules or standards;

⁽¹⁾ Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data, and repealing Regulation (EC) No 45/2001 and Decision No 1247/2002/EC (OJ L 295, 21.11.2018, p. 39).

- (d) 'blocking rules' means rules or a set of rules that measure the degree to which input data is compliant with defined data requirements conditioning their storage or use or both. They also include data quality rules governing each EU information system that must be complied with before data can be entered in the system. Input data not complying with a blocking rule will be rejected from being entered and stored in the EU information system and interoperability component;
- (e) 'soft rules' means rules or a set of rules that measure the degree to which the input data is compliant with the defined data requirements conditioning its relevance or optimal use or both. Soft rules shall not prevent the entry and storage of non-compliant input data. They also include data quality rules governing each EU information system that should be complied with before data can be entered in the system. Input data not complying with a soft rule shall be entered into the EU information system or interoperability component with a data quality issue flag, notification or warning message.

Article 3

Automated data quality control mechanisms and procedures

1. Automated quality checks shall be conducted on the data entered and stored in the shared biometric matching service and the common identity repository in accordance with the rules laid down in Article 4.
2. Automated quality checks shall be conducted on the data entered and stored in the EU information systems referred to in Article 37(1) of Regulation (EU) 2019/818 in accordance with the rules governing data quality control mechanisms in those systems.
3. Data quality control mechanisms shall be triggered in accordance with the rules governing data quality in those EU information systems and interoperability components.
4. In order to determine compliance of input data with the blocking or soft rules applying to them, the data quality control mechanisms referred to in paragraph 3 shall comply with Section 1 of the Annex to this Regulation.
5. If the input data is to be entered into the EU information system or interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818, the data quality control mechanisms shall assess the extent to which the data complies with each data quality indicator by applying the data quality standard of each indicator. As a result of that assessment, the data quality control mechanisms shall assign to the input data a data quality classification pursuant to the process laid down in Sections 2 and 3 of the Annex to this Regulation.
6. The common data quality indicators shall be the following: completeness, accuracy, timeliness, uniqueness and consistency.
7. eu-LISA shall implement the data quality standards for each indicator pursuant to the procedures laid down in Article 5.
8. Data cleaning and issue detection mechanisms shall regularly check the validity and the data quality compliance of the data stored in the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818, in accordance with Section 4 of the Annex to this Regulation.

Article 4

Automated data quality control mechanisms for data entered and stored

1. To enhance data quality, automated data quality control mechanisms shall be set up to support the entering and storage of data complying with data quality requirements in the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818. The data shall be entered and stored in accordance with the rules governing data quality in those EU information systems or interoperability components.

2. For the purpose of the entry of data by the duly authorised staff in the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818, the automated quality control mechanisms shall verify the common quality indicators referred to in Section 2 of the Annex to this Regulation.

3. Data quality control mechanisms shall allow the application of blocking rules and soft rules in accordance with Article 3(4) governing data quality in the EU Information Systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818.

Article 5

Procedures governing the data quality control indicators, standards and mechanisms

1. eu-LISA shall be responsible for ensuring that the data quality rules are appropriate for achieving the objectives of the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818.

2. eu-LISA shall also be responsible for implementing the minimum quality standards for storage of biometric data in the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818.

3. For the purposes of paragraphs 1 and 2 of this Article, eu-LISA shall take into consideration the specific needs of each EU information system and interoperability component referred to in Article 37(1) of Regulation (EU) 2019/818 and shall be assisted and advised by experts from the Commission, the Member States and the Union agencies using those EU information systems and interoperability components.

4. The following data quality control procedures shall apply:

- (a) eu-LISA shall implement the data quality standards for each data quality indicator in accordance with Section 2 of the Annex to this Regulation;
- (b) values shall be assigned to the standards separately for each of the data quality indicators referred to in Article 3(6). For each indicator, the standards may assign different values depending on the category of data;
- (c) when so required and after the issuance of the regular data quality reports in accordance with Article 6, eu-LISA shall assess the appropriateness of the values and the standards and amend them to the extent to which they are no longer appropriate;
- (d) when so required and after the issuance of the regular data quality reports in accordance with Article 6, eu-LISA shall assess the appropriateness of the data quality control mechanisms allowing for the application of blocking and soft rules and amend them where relevant;
- (e) with a view of amending the data quality standards and their values, and to taking any decision on the data quality control mechanisms pursuant to points (c) and (d) of this paragraph, eu-LISA shall consult the Advisory Groups for each of the EU information systems and interoperability components referred to in Article 37(1) of Regulation (EU) 2019/818.

5. eu-LISA shall base itself on the assessment of the functioning of the data quality control mechanisms with a view to amending the values of the data quality standards and to taking any decision on the data quality control mechanisms.

Article 6

Reports on automated data quality control mechanisms and procedures and common data quality indicators pursuant to Article 37(3) of Regulation (EU) 2019/818

1. Reports referred to in Article 37(3) of Regulation (EU) 2019/818 shall be produced by the central repository for reporting and statistics pursuant to Article 39(1) of Regulation (EU) 2019/818 and the rules laid down in the Delegated Regulation 2021/2222.

2. Reports shall not include personal data and contain at least the following information metrics on the quality of data, extracted via a tool or set of tools developed for these purposes:

- (a) for alphanumeric and biometric data assessed against blocking rules and soft rules, compliance with data quality indicators:
 - (1) completeness (%);
 - (2) accuracy (%);
 - (3) uniqueness (%);
 - (4) timeliness (%);
 - (5) consistency of data (%);
- (b) completeness of application files (%);
- (c) compliance of data with the 'good quality' classification (%);
- (d) compliance of data with the 'low quality' classification (%);
- (e) results of the data cleaning mechanism;
- (f) results of the issue detection mechanism;
- (g) data fields that cause frequent quality issues;
- (h) top 10 issues list for each of the categories referred to in points (a) to (g);
- (i) the Member States concerned by the top 10 quality issues.

3. eu-LISA shall develop a central monitoring capacity for data quality and for producing the reports referred to in this Article on a weekly basis.

Article 7

Entry into force

This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in the Member States in accordance with the Treaties.

Done at Brussels, 16 November 2021

For the Commission
The President
Ursula VON DER LEYEN

ANNEX

SECTION 1

Automated data quality control mechanism for data to be entered

Data entered into the EU information systems and interoperability components will be subject to automated data quality control mechanisms based on blocking and soft rules as defined in Article 2. These are the rules established in the EU information systems and interoperability components which determine whether the entry and storage of input data shall be allowed or rejected. The blocking and soft rules are established based on the following parameters: length, format, type, conformity to quality standards, semantics, repetition and syntax.

SECTION 2

General considerations on the common data quality indicators and minimum quality standards for data to be entered

The input data subject to the quality verification process shall be assessed against the data quality rules defined in each EU information system and interoperability component, as set out in Section 1. If the rules applying to the input data do not prevent entry and storage, the data quality control mechanisms shall measure the quality of the input data by using the data quality indicators applying to them.

The data quality control mechanisms shall measure the quality of input data according to each relevant indicator. The data quality control mechanisms shall take into account a weighing coefficient to calculate the relative weight of each indicator on the overall quality of the input data.

To that effect, the data quality control mechanisms shall be adapted to apply to a single collection of data within a record, or to a database.

After applying the weighing coefficient to the input data, the data quality control mechanisms shall produce an input data profile containing the results of the application of the indicator standards, for example numerical values evaluating the quality of the input data under each indicator.

Table 1 lists the minimum set of data quality indicators, for example indicators that shall always apply to input data, in accordance with the rules applied by each EU information system and interoperability component. Such indicators are the following: completeness, accuracy, consistency, timeliness, uniqueness.

Table 1

List of minimum data quality indicators

<i>Indicator</i>	<i>Description</i>	<i>Main scope of applicability</i>	<i>Unit of measurement</i>
Completeness	Means the degree to which the input data has values for all the expected attributes and related requirements in a specific context of use. Measures whether all the mandatory data is provided and the database (or sectoral) listings meet the set demands.	Mandatory data fields (alphanumeric and biometric)	Data completeness rate: ratio of the number of data cells provided to the number of data cells required
Accuracy	Means the degree to which the input data represents closeness of estimates to the unknown true values. It can be either or both among data regarding one entity and across similar data for comparable entities	Alphanumeric and biometric data	Sampling error rates, unit non-response rate, item non-response rate, data capture error rates, etc.

Consistency	Means the degree to which the input data has attributes that are free from contradiction and are coherent with other data in a specific context of use. Measures the degree to which a set of data satisfies defined business rules applying to those data across them, means the absence of a conflict of data content. It can be either or both among data regarding one entity and across similar data for comparable entities.	Alphanumeric data	Percentage
Timeliness	Means the degree to which the input data is provided within a predefined date or time that condition the validity of the data or its context of use. Measures how up-to-date the data is, and whether the data required can be provided by the required time.	Alphanumeric and biometric data	Time lag -final: number of days from the last day of the reference to the day the input data is provided
Uniqueness	Means the degree to which the input data is not duplicated in the same EU information system or interoperability component.	Mandatory data fields (alphanumeric and biometric)	Percentage of data units which are not duplicated

The accuracy indicator for biometric data also includes resolution. Resolution measures the degree to which the input data contains the required amount of points or pixels by unit of length. Unit to display on screen pixel: *pi unit* for printing; *dot pi* for output systems. Pixel one or several bits (range of colours ex: 16 colours 4b, 256 8b, 16b 65k, 24b 16.5mio)

SECTION 3

Data Quality Classification

After the development of the input data profile, referred to in Section 2, the input data shall be assigned with a data quality classification. The following data quality classifications shall apply:

- (a) 'good quality' means the input data profile demonstrates the required compliance with the applicable data quality indicator;
- (b) 'low quality' means the input data profile does not demonstrate the required compliance with the applicable data quality indicators, in the case of a soft rule;
- (c) 'rejected' means the input data profile does not demonstrate the required compliance with the applicable data quality indicators in case of a blocking rule.

Where the input data is assigned with a 'good quality' classification, the data shall be stored into the system or component without any data quality alert.

Where the input data is assigned with a 'low quality' classification, the data shall be stored into the system or component and with a data quality alert. An alert shall indicate that the input data shall be rectified and the reason why the input data does not demonstrate the required compliance with the applicable data quality indicators. Where possible, the alert shall identify the data field(s) or the data content(s) or both affected by data quality issues and suggest the changes necessary for the input data to meet the 'good quality' classification.

SECTION 4

Data Quality Monitoring

Two types of mechanisms shall be used for the purposes of Article 3(8):

- (a) Data cleaning mechanisms. Such mechanisms shall carry out checks to identify data for which the remaining retention period is less than the time defined in the legislation governing the relevant EU information system or interoperability component. Data cleaning mechanisms shall inform the Member State of the scheduled erasure of the data and allow them to adopt, if necessary, the appropriate measures.
- (b) Issue detection mechanisms. Such mechanisms shall carry out checks to identify the data that no longer meet one or more data quality rules or standards related to data quality indicators. Such checks may return an alert or notification to the responsible authority of the Member State indicating the reason why the data no longer meets one or more data quality rules or standards. Where possible, the alert shall suggest the changes necessary for the input data to meet the new rules or standards. In no case the application of such checks shall lead to automated deletion of data stored in the EU information systems or interoperability components. When new data is being entered into an EU information system or interoperability component while the issue detection mechanisms are running, the issue detection mechanisms shall not apply to those data.

eu-LISA may decide that ad hoc issue detection mechanisms shall be carried out in the EU information system and in the interoperability components upon the revision of the data quality rules or standards.

eu-LISA may consult the Advisory Group for one of the EU information systems or the interoperability components on whether to carry out an ad hoc issue detection mechanisms in its corresponding EU information system or interoperability component to the extent necessary for the purposes of that EU information system or interoperability component.
