
Data quality —

Part 65:

**Data quality management: Process
measurement questionnaire**

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 184, *Automation systems and integration*, Subcommittee SC 4, *Industrial data*.

A list of all parts in the ISO 8000 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

The ability to create, collect, store, maintain, transfer, process and present data to support business processes in a timely and cost effective manner requires both an understanding of the characteristics of the data that determine its quality, and an ability to measure, manage and report on data quality.

ISO 8000 defines characteristics that can be tested by any organization in the data supply chain to objectively determine conformance of the data to ISO 8000.

ISO 8000 provides frameworks for improving data quality for specific kinds of data. The frameworks can be used independently or in conjunction with quality management systems.

ISO 8000 covers industrial data quality characteristics throughout the product life cycle from conception to disposal. ISO 8000 addresses specific kinds of data including, but not limited to, master data, transaction data, and product data.

This document establishes a simple measurement method, based on the high-level reference processes of ISO 8000-61. Evaluating the data quality management implementation of an organization. Each question has been derived from the outcomes of every process in ISO 8000-61.

[Annex A](#) contains an identifier that unambiguously identifies this document in an open information system.

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Data quality —

Part 65:

Data quality management: Process measurement questionnaire

1 Scope

This document specifies a questionnaire to audit the performance of the processes specified by the process reference model in ISO 8000-61.

NOTE 1 This questionnaire is applicable to all types of business process, technology, information system, data and data processing. This questionnaire can be used as part of a continuous improvement process.

The following are within the scope of this document:

- guiding principles for generating questions from the process outcomes specified by ISO 8000-61;
- one or more questions for each outcome of every process in ISO 8000-61;
- a measurement method based on a simple indicator and measurement scale for each question;
- guidance on how to present the results generated by the questionnaire.

NOTE 2 The questions and corresponding indicators in this document conform to the requirements of ISO 8000-63.

The following is outside the scope of this document:

- defining how the questions relate to models of organizational process maturity.

NOTE 3 Such models define an overall scale by which to understand the degree to which an organization is performing effectively and efficiently.

EXAMPLE ISO 8000-62 and ISO 8000-64 ¹⁾specify how to use maturity models with ISO 8000-61.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8000-2, *Data quality — Part 2: Vocabulary*

ISO 8000-61, *Data quality — Part 61: Data quality management: Process reference model*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8000-2 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>

1) Under preparation.

— IEC Electropedia: available at <http://www.electropedia.org/>

4 Data quality management

The processes for data quality management specified by ISO 8000-61 shall be followed. This document specifies a process measurement questionnaire based on those processes (see [Figure 1](#)).

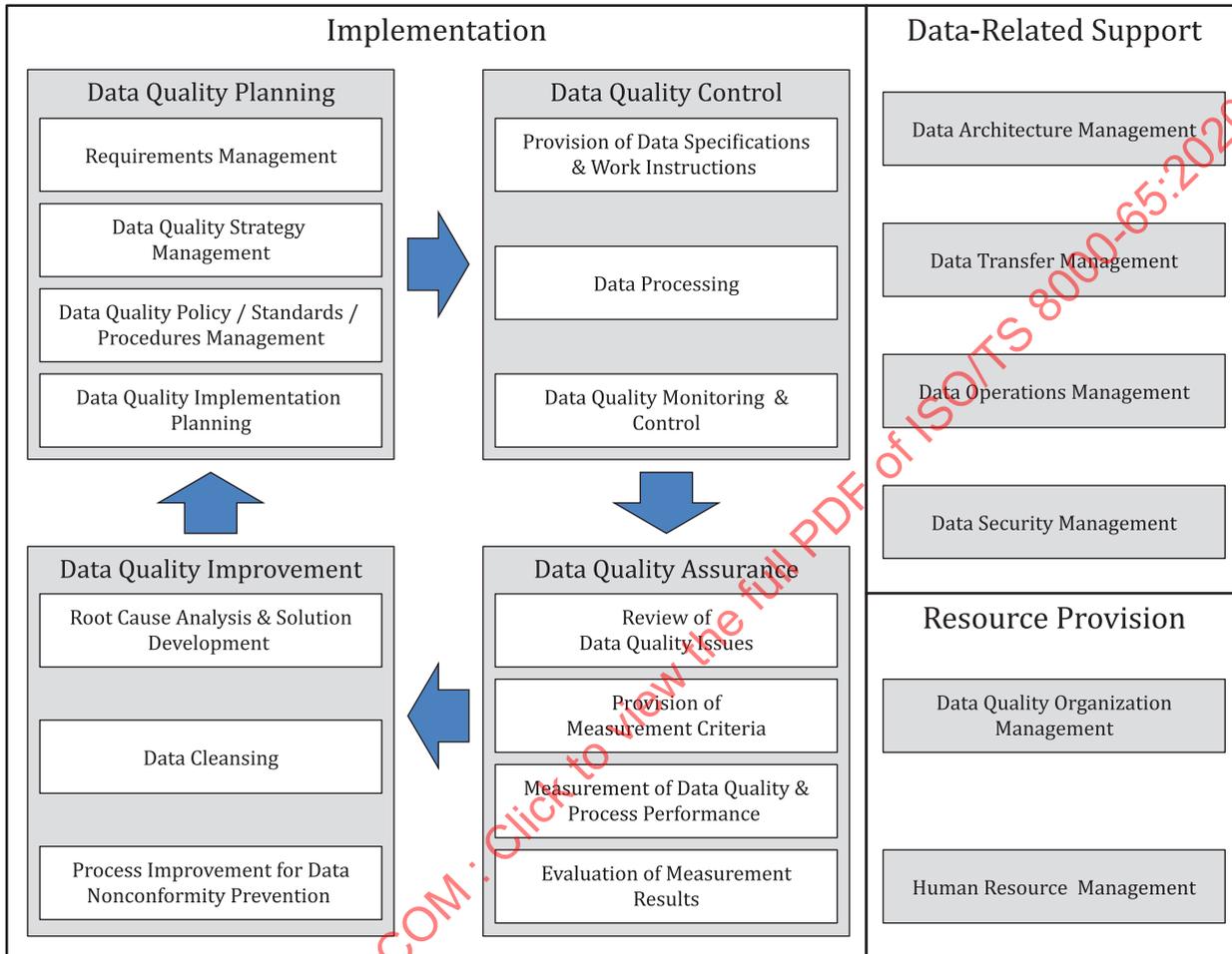


Figure 1 — Data quality management as specified by ISO 8000-61

5 Process measurement questionnaire

5.1 Questionnaire overview

5.1.1 Questionnaire structure

For each of the ISO 8000-61 processes and associated outcomes, the questionnaire provides a set of questions. These questions enable an initial high-level assessment of the maturity of the data quality management processes that have been implemented by an organization.

Each question addresses a particular organizational capability (see [Table 1](#)). These capabilities deliver the totality of the operational effect of the organization.

When the organization analyses the results from using the questionnaire, the organizational capabilities are a useful way in which to present the results and provide evidence as to which capabilities are most in need of improvement.

Table 1 — Organizational capabilities

Organizational capability	Description
Data exchange	Moving data between different systems, either internally or with an external organization.
Data exploitation	Delivering value to the organization from data.
Good practice deployment	Adopting processes and supporting elements that have been proven by other organizations to be effective and efficient.
Human resource management	Appointing and supporting the right people to meet the needs of the organization.
Health and safety executive and risk management	Ensuring the organization mitigates threats and exploits opportunities in respect of health, safety and the environment.
Knowledge and skills	Exploiting opportunities to improve the capability of people to perform the responsibilities of their allocated roles.
Legal management	Managing the implications of legislation on the activities of the organization.
Partner and contract management	Establishing and monitoring effective relationships with other organizations.
Performance improvement	Monitoring performance and identifying opportunities to become more effective or more efficient.
Standardization and computerization	Implementing consistent processes that include appropriate automation to remove repetitive activities for human operators.
Leadership and strategy set-up	Establishing the overall framework within which the organization understands the direction and targets for achieving collective success.

5.1.2 Guiding principles for generating questions

The ISO 8000-61 outcomes are used to generate questions for the questionnaire.

5.1.3 Indicators and measurement scale

The measurement scale for each question is “Yes” or “No”.

When the answer to a question is “Yes”, proof of the answer is necessary.

When the proof is provided by referencing an existing document, the following supporting data is necessary:

- document number;
- document title;
- document version.

This data provides a baseline for future assessments.

5.1.4 Questionnaire content

The questionnaire addresses each of the following higher-level processes from ISO 8000-61:

- data quality planning (see [5.2](#));
- data quality control (see [5.3](#));
- data quality assurance (see [5.4](#));
- data quality improvement (see [5.5](#));
- data-related support (see [5.6](#));

- resource provision (see 5.7).

5.2 Data quality planning

5.2.1 Requirements management

The purpose of requirements management is to establish the basis for creating or for refining a data quality strategy that aligns with the needs and expectations of stakeholders.

The outcomes of requirements management are as follows and are the basis for the questions about requirements management (see Table 2).

- The needs and expectations of stakeholders with respect to data are collected.
- The needs and expectations are refined into data requirements.

NOTE This refinement can include structuring and classifying requirements to improve understanding of the interdependencies of those requirements.

- Requirements are analysed to determine their feasibility in terms of technology, cost, manpower, and schedule.
- Requirements are prioritized and approved.
- The needs of different parts of the organization are balanced and an agreed common set of requirements is achieved.

Table 2 — Questions about requirements management

Organizational capability	Question	Example of proof
Data exchange	Do you collect and classify data requirements from stakeholders or business partners?	Existence of a data requirements report
Data exploitation	Do you prioritize and validate data requirements with stakeholders?	Existence of a document signed by the stakeholders

NOTE Annex B collates all the questions of the questionnaire in a single table.

5.2.2 Data quality strategy management

The purpose of data quality strategy management is to establish the long-term goals for data quality across the organization, and short-term objectives to achieve those goals.

The outcomes of data quality strategy management are as follows and are the basis for the questions about data quality strategy management (see Table 3).

- Top management is committed to the improvement of data quality to agreed levels at the organizational level.
- A data quality strategy is created, describing the vision, long-term goals, an implementation roadmap and short-term objectives, which are defined in terms of quantitative outcomes.
- A framework is created for establishing and reviewing the data quality strategy.
- Results are evaluated to determine the performance of the data quality strategy, leading to the strategy being updated as necessary.
- The data quality strategy is communicated throughout the organization.

Table 3 — Questions about data quality strategy management

Organizational capability	Question	Example of proof
Leadership and strategy set-up	Do you commit top management to the continual improvement of data quality?	Existence of a data quality chapter in the quality manual or Existence of committees with top management on data quality or Existence of a Chief Data Officer and/or a data quality sponsor in top management
Leadership and strategy set-up	Did you create a data quality strategy, describing the vision, long-term goals, an implementation roadmap and short-term objectives, which are defined in terms of quantitative outcomes? Do you communicate the data quality strategy throughout the organization?	Document distributed and applied with respect to data quality strategy
Good practice deployment	Are you using a framework for establishing and reviewing the data quality strategy?	Existence of a framework
Leadership and strategy set-up	Do you evaluate results to determine the performance of the data quality strategy?	Existence of a process performance report
Leadership and strategy set-up	Do you update the strategy according to those results through consultation with stakeholders?	Existence of process performance method and an improvement cycle
Data exploitation	In the organization, are there indicators that can be used to measure the impact of data quality on delivering the mission of the organization?	Existence of impact measurement indicators for data quality management

5.2.3 Data quality policy/standards/procedures management

The purpose of data quality policy/standards/procedures management is to capture rules that apply to performing the processes data quality control, data quality assurance, data quality improvement, data-related support and resource provision consistently across the organization.

The outcomes of data quality policy/standards/procedures management are as follows and are the basis for the questions about data quality policy/standards/procedures management (see [Table 4](#)).

- Policies are defined in terms of fundamental intentions and rules that guide the organization as to which actions are appropriate and which are inappropriate in performing data quality management.
- Standards are defined to support data quality management.

NOTE These standards include those covering formats for expressing data requirements, measurement methods, how to sustain data quality when changing supporting technology, and the infrastructure of computer hardware and software systems.

- Procedures are defined to specify in detail how the organization performs data quality management.
- Policies, standards and procedures are communicated throughout the organization, covering the consistent application to data quality management.

Table 4 — Questions about data quality policy/standards/procedures management

Organizational capability	Question	Example of proof
Standardization and computerization	Are appropriate policies for data quality specified, published, known and applied? Are these policies coherent with the data quality strategy?	Existence of a document with fundamental intentions and rules for data quality management in the organization
Standardization and computerization	Are applicable standards specified, known and applied?	Existence of a list of standards with which to conform
Standardization and computerization	Are procedures related to data quality specified, published, known and applied?	Existence of business process model for data quality management

5.2.4 Data quality implementation planning

The purpose of data quality implementation planning is to identify the resources and sequencing by which to perform the processes data quality control, data quality assurance, data quality improvement, data-related support and resource provision across the organization.

The outcomes of data quality implementation planning are as follows and are the basis for the questions about data quality implementation planning (see [Table 5](#)).

- A scope and target are defined for data quality in accordance with the data quality objectives.
- Implementation plans are established in detail.
- Manpower, financial and technology resources are allocated and managed to ensure successful execution of the implementation plans.
- Roles, responsibilities and authorities are allocated and controlled to cover all aspects of data quality management.

NOTE ISO 8000-150²⁾ provides detail on roles and responsibilities that contribute to effective and efficient data quality management.

- Progress is monitored against implementation plans to achieve improved data quality.
- Performance results are evaluated to report to top management on the effectiveness of the implementation plans, with those plans being updated as necessary based on the results.

Table 5 — Questions about data quality implementation planning

Organizational capability	Question	Example of proof
Good practice deployment	Do you have an implementation roadmap of your data quality processes?	Existence of implementation roadmap as a Gantt chart
Leadership and strategy set-up	Do you monitor and update your progress against implementations plans?	Improvement measures using the initial roadmap
Leadership and strategy set-up	Do you have a master data integration strategy for the organization?	Existence of a strategy document on data integration

2) Under preparation.

5.3 Data quality control

5.3.1 Provision of data specifications and work instructions

The purpose of provision of data specifications and work instructions is to establish the basis on which to perform data processing and data quality monitoring and control, taking account of the outcomes of the data quality planning, the data-related support and the resource provision processes.

The outcomes of provision of data specifications and work instructions are as follows and are the basis for the questions about provision of data specifications and work instructions (see [Table 6](#)).

- Data specifications are defined to describe the required characteristics of data for data processing and data quality monitoring and control.
- Work instructions are defined to specify the approach to data processing.
- Work instructions are defined to specify the approach to data quality monitoring and control.

NOTE Work instructions for data quality monitoring and control include methods to measure data nonconformities and process performance.

Table 6 — Questions about provision of data specifications and work instructions

Organizational capability	Question	Example of proof
Partner and contract management	Do you define your data specifications for all providers or partners?	Existence of documented data specifications or the names of used standards
Good practice deployment	Do you define your work instructions to specify the approach to data processing for data users or operators? NOTE Work instructions are lists of actions.	Existence of up-to-date work instructions

5.3.2 Data processing

The purpose of data processing is, by following applicable work instructions, to deliver data that meet requirements in the corresponding data specification.

The outcomes of data processing are as follows and are the basis for the questions about data processing (see [Table 7](#)).

- Data processing has conformed to the applicable work instructions.

NOTE 1 Data processing is an integral part of many different types of process across the organization.

- Data meets the applicable data specification.
- Records are kept of all data processing activity, whether performed by people or by software applications.

NOTE 2 Data logging takes place to a degree that is appropriate to the benefit achieved for the associated processing cost.

Table 7 — Questions about data processing

Organizational capability	Question	Example of proof
Legal	Do you keep a log of all data operations performed by data users or applications?	Existence of a data operations log

5.3.3 Data quality monitoring and control

The purpose of data quality monitoring and control is, by following applicable work instructions, to identify and respond when data processing fails to deliver data that meet the requirements in the corresponding data specification.

The outcomes of data quality monitoring and control are as follows and are the basis for the questions about data quality monitoring and control (see [Table 8](#)).

- Risks are identified and quantified against the applicable data specifications, covering the corresponding impacts on the organization or other stakeholders.
- Priorities are identified with respect to monitoring and controlling of risks.
- Records are kept for comparing performance with planned results for processes monitored with respect to identified risks.

NOTE The comparison of performance can take place at intervals or continuously.

- End users are notified when planned results are not achieved for processes, seeking those users to follow data specifications and work instructions more effectively in implementing and maintaining the processes.
- Data nonconformities are identified, classified and corrected.
- Records are kept of actions taken to address data nonconformities.
- Stakeholders are notified of actions taken to address data nonconformities.
- Guidelines, rules and procedures are refined and applied to prevent recurrence of data nonconformities.

Table 8 — Questions about data quality monitoring and control

Organizational capability	Question	Example of proof
Health and safety executive and risk management	Do you identify, quantify and prioritize risks against data specifications?	Existence of a risk assessment report
Data exploitation	Can you measure the impact of data quality issues in terms of turnover or reduced operational capability?	Existence of a business impact report
Performance improvement	Do you identify, analyse, and validate data nonconformities? Do you list their recurrence?	Existence of list of nonconformities, associated corrections and any recurrences
Legal	Do you keep logs of actions taken to address data nonconformities?	Existence of a log explaining actions
Performance improvement	Do you refine and apply guidelines, rules and procedures to prevent recurrence of data nonconformities?	Update of data quality business process model

5.4 Data quality assurance

5.4.1 Review of data quality issues

The purpose of review of data quality issues is to identify the starting point for deciding to measure data quality levels and process performance with the potential to generate opportunities to improve data quality.

The outcomes of review of data quality issues are as follows and are the basis for the questions about review of data quality issues (see [Table 9](#)).

- Data quality assurance is initiated in response to issues arising as a result of data quality planning or data quality control.

NOTE Various types of issue are possible, including unresolved data nonconformities, indications of the recurrence of particular types of nonconformity, stakeholders indicating their expectations have not been met, and reports of possible problems with data requirements or the methods for conformance testing of data.

- A set of related data nonconformities is identified as triggering the need for appropriate measurement of data quality levels and process performance as part of data quality assurance.

Table 9 — Questions about review of data quality issues

Organizational capability	Question	Example of proof
Good practice deployment	Do you review data quality issues?	Issues have been assigned and considered by the right people

5.4.2 Provision of measurement criteria

The purpose of provision of measurement criteria is to establish the basis on which to perform measurement of data quality and process performance with respect to the set of data nonconformities output by the review of data quality issues process.

The outcomes of provision of measurement criteria are as follows and are the basis for the questions about provision of measurement criteria (see [Table 10](#)).

- A scope is defined for the data and processes to be the subject of measuring.
- Measurement scale are defined relating to the characteristics of data and the performance of the processes.
- Measurement methods are defined by which to determine values for the identified measurement scale.

Table 10 — Questions about provision of measurement criteria

Organizational capability	Question	Example of proof
Good practice deployment	Do you set the basis (quality indicators) on which to perform measurement of data quality and process performance?	Existence of a data quality report framework

5.4.3 Measurement of data quality and process performance

The purpose of measurement of data quality and process performance is, in accordance with the outputs of the provision of measurement criteria process, to generate input for the evaluation of measurement results process.

The outcomes of measurement of data quality and process performance are as follows and are the basis for the questions about measurement of data quality and process performance (see [Table 11](#)).

- A plan is established by which to conduct measurement of data quality and process performance.
- Appropriate resources are deployed for the measurement.
- Values are measured for data quality and process performance.

Table 11 — Questions about measurement of data quality and process performance

Organizational capability	Question	Example of proof
Performance improvement	Do you measure data quality and process performance levels?	Existence of a data quality report
Good practice deployment	Across the organization, have you systemized measurement of data quality?	Description of the measurement procedure

5.4.4 Evaluation of measurement results

The purpose of evaluation of measurement results is to establish the priorities for performing data quality improvement.

The outcomes of evaluation of measurement results are as follows and are the basis for the questions about evaluation of measurement results (see [Table 12](#)).

- Measurement results are analysed to provide a quantitative perspective on identified data nonconformities.
- An impact is evaluated, indicating the effect of poor levels of data quality or poor process performance on the organization or other stakeholders.

Table 12 — Questions about evaluation of measurement results

Organizational capability	Question	Example of proof
Data exploitation	Do you analyse measurement results to evaluate the impact and to prioritize the necessary response?	Risk evaluation for each item (e.g. financial, health/safety/environmental)

5.5 Data quality improvement

5.5.1 Root cause analysis and solution development

The purpose of root cause analysis and solution development is to establish, in accordance with the data quality strategy and with the priorities identified by data quality assurance, the basis on which to perform data cleansing or process improvement for data nonconformity prevention.

The outcomes of root cause analysis and solution development are as follows and are the basis for the questions about root cause analysis and solution development (see [Table 13](#)).

- Root causes and associated impacts are analysed for each identified data quality issue, based on the results from the *data quality assurance* process and taking account of the data quality strategy.
- Solutions are proposed involving data cleansing and process improvements to prevent recurrence of identified root causes.
- The cost-effectiveness is analysed for each identified solution.
- The priority is determined for each identified solution.
- A plan is established to implement the identified solutions.

Table 13 — Questions about root cause analysis and solution development

Organizational capability	Question	Example of proof
Performance improvement	Do you analyse root causes and develop improvement solutions to eliminate them?	Root cause analysis and solutions with a feasibility or Evaluation using cost-benefit analysis

5.5.2 Data cleansing

The purpose of data cleansing is to ensure, in response to the results of root cause analysis and solution development, the organization can access data sets that contain no nonconformities capable of causing unacceptable disruption to the effectiveness and efficiency of decision making using those data.

The outcomes of data cleansing are as follows and are the basis for the questions about data cleansing (see [Table 14](#)).

- A detailed specification is developed for data cleansing to correct each identified data nonconformity.
NOTE Cleansing can involve both human interventions to correct data values and the use of automated tools to perform systematic actions on data sets.
- A schedule is developed and implemented in consultation with stakeholders to execute the required data cleansing.
- A record is kept of all corrections made to the data.
- Actions are developed to prevent the recurrence of actual or the occurrence of potential data nonconformities.

Table 14 — Questions about data cleansing

Organizational capability	Question	Example of proof
Good practice deployment	Do you correct data nonconformities and related data?	Detailed specification for data cleansing or Schedule validated with stakeholders or Log of all corrections made to the data
Performance improvement	Do you act to prevent their recurrence?	Positive trends in the data quality indicators

5.5.3 Process improvement for data nonconformity prevention

The purpose of process improvement for data nonconformity prevention is to transform processes, taking account of the results of root cause analysis and solution development, and to increase the extent to which the organization achieves a systematic and systemic approach to achieving data quality.

The outcomes of process improvement for data nonconformity prevention are as follows and are the basis for the questions about process improvement for data nonconformity prevention (see [Table 15](#)).

- Proposals are produced in detail for process improvements.

NOTE 1 The process improvements can be either improvements of existing processes or suggestions of planned future processes. The process that needs an improvement can be a constituent of the data quality management process, a data management process or any business process performed in the organization.

NOTE 2 Improvements of organization, people, architecture, hardware and software can be specified in the detailed proposals for process improvements.

- A schedule is agreed with stakeholders for implementation of the process improvements.
- The agreed schedule is carried out.
- The effectiveness is evaluated for the process improvements that are implemented.

NOTE 3 This evaluation takes place by measuring the extent to which data nonconformities are reduced compared to before implementation of the improvements.

- The efficiency is evaluated for the process improvements that are implemented.

NOTE 4 This evaluation takes place by measuring the extent to which the resources used are reduced compared to before implementation of the improvements.

Table 15 — Questions about process improvement for data nonconformity prevention

Organizational capability	Question	Example of proof
Performance improvement	Do you measure the efficiency of your processes?	Positive trends in the data quality indicators

5.6 Data-related support

5.6.1 Data architecture management

The purpose of data architecture management is to ensure data quality control, data quality assurance, data quality improvement, data transfer management and data operations management can re-use consistent structures and meanings for data across the organization.

The outcomes of data architecture management are as follows and are the basis for the questions about data architecture management (see [Table 16](#)).

- Data models are defined to share data among different software applications and different parts of the organization.
- Transport mechanisms are implemented for common data to enable data exchange and sharing.
- Data-related artefacts are created and maintained for common use across the organization.

NOTE These artefacts include master and reference data, naming rules for data, data modelling methods, database designs and data architectures. These artefacts can be based on existing, externally defined standards.

- The data architecture is extended as necessary to support new data requirements.

5.6.2 Data transfer management

The purpose of data transfer management is to support data quality control, data quality assurance and data quality improvement by ensuring the traceability of all data that flows within, into and out from the organization.

The outcomes of data transfer management are as follows and are the basis for the questions about data transfer management (see [Table 17](#)).

- Records are kept of all data transfers.

- The data is tracked to identify those transferred data sets that result in data nonconformities.
- Data transfer is monitored and controlled according to applicable data specifications and work instructions.

Table 16 — Questions about data architecture management

Organizational capability	Question	Example of proof
Data exchange	Do you define data models to exchange data among different applications and different parts of the organization?	Existence of data models
Good practice deployment	Do you have a dictionary that is accessible for everyone?	Existence of a data dictionary
Good practice deployment	Do you give the data life cycle when defining data?	Existence of a data model lifecycle or CRUD (Create, Read, Update and Delete) or SIPOC (Supplier, Input, Process, Output, Customer)
Standardization and computerization	Do you have common data modelling rules and tools across the organization?	Existence of a data modelling structure (rules and tools)
Standardization and computerization	Across the organization (or at project level when appropriate), is there a control process covering enrichment of a common data dictionary, and definition of the life cycles, when creating a new project or deleting an application?	Existence of a control process
Standardization and computerization	When data changes, have processes been implemented across the organization (or at project level when appropriate) to convert the data models concerned?	Existence of data models' conversion processes
Standardization and computerization	Are your data management tools (including extract/transform/load) connected to data dictionaries and data models?	Existence of data management tools connected to dictionaries and data models

Table 17 — Questions about data transfer management

Organizational capability	Question	Example of proof
Legal	Do you log, monitor and control data transfers?	Data transfer logs

5.6.3 Data operations management

The purpose of data operations management is to support data quality control, data quality assurance and data quality improvement by ensuring implementation technology is properly configured to sustain data integrity and availability throughout the data life cycle.

The outcomes of data operations management are as follows and are the basis for the questions about data operations management (see [Table 18](#)).

- Environments are implemented and controlled to support the processing of data.

NOTE 1 These environments include database management system software and database connectivity, ensuring effective and efficient processing of data across the organization.

- Data is prepared in standard data formats for exchange to and from software applications or external third-party sources.

EXAMPLE ISO 8000-110 provides detailed requirements on the exchange of characteristic data that are master data.

- Mechanisms are implemented for data backup and recovery to guarantee the recoverability of the data when necessary.
- Performance and reliability are ensured for all data operations.

NOTE 2 Performance and reliability are ensured by mechanisms including performance tuning, monitoring, and error reporting.

- Data technologies are installed and supported.

NOTE 3 These technologies include database management system software, data management utilities, data modelling tools, data quality analysis tools and data cleansing tools.

Table 18 — Questions about data operations management

Organizational capability	Question	Example of proof
Standardization and computerization	Do you exchange data in standard format with stakeholders and third parties?	Existence of a list of used standards to address data related topics
Standardization and computerization	Are there procedures for creation of master and reference data? If so, are those procedures implemented across the organization?	Documentation of these procedures: data formats, fields to complete in the database, etc.
Standardization and computerization	Across the organization, have processes been set up to manage master and reference data?	List of processes to check
Data exchange	Across the organization, do managed repositories feed the applications that use master and reference data?	Ratio of number of applications sharing the same reference data to number of applications having their own reference data
Data exchange	Is there a procedure enabling each new project to identify the repository with which to set up connections when needed?	Existence of the procedure

5.6.4 Data security management

The purpose of the data security management process is to support the other processes of data quality management by ensuring the confidentiality, integrity and availability of data across the organization.

The outcomes of data security management are as follows and are the basis for the questions about data security management (see [Table 19](#)).

- Policy, standards, controls and procedures are defined for data security.

NOTE Different types of data and the subject matter of that data can be of different degrees of sensitivity and require different levels of security.

- Usernames and passwords are managed to control computer system and software application access by users.
- Data access views and permissions are managed. These views are associated with individual usernames based on the roles and responsibilities of the corresponding user.
- Data access is monitored and logged to identify which users have accessed what data.
- Results are evaluated to determine the performance of implementing data security.

Table 19 — Questions about data security management

Organizational capability	Question	Example of proof
Good practice deployment	Do you set data security criteria?	Up-to-date policy, standards, controls and procedures for data security
Good practice deployment	Do you manage data access authorization?	List of data access privileges and responsibilities for users and list of data access by users
Good practice deployment	Do you audit data security?	Evaluation of the performance of data security and list of actions to improve confidentiality, integrity and availability of data

5.7 Resource provision

5.7.1 Data quality organization management

The purpose of the data quality organization management process is to support the other processes of data quality management by establishing appropriate structures for organizational units that execute, communicate and co-ordinate their responsibilities for data quality.

The outcomes of data quality organization management are as follows and are the basis for the questions about data quality organization management (see [Table 20](#)).

- Organizational units are implemented and managed with respect to resources, including manpower, cost, and technology, to support data quality management.
- Committees or team meetings are held to make decisions with respect to data quality.
- Data and documents are managed after being generated by the data quality management process.

Table 20 — Questions about data quality organization management

Organizational capability	Question	Example of proof
Leadership and strategy set-up	Are long-term data governance powers granted across the organization? (For example, unit, mission, Chief Data Officer, project, etc.)	Existence of data governance specific initiatives
Leadership and strategy set-up	Do you hold committees or team meetings to make decisions with respect to data quality?	Existence of meeting reports

5.7.2 Human resource management

The purpose of the human resource management process is to ensure the availability of suitably qualified personnel to perform the other processes of data quality management.

The outcomes of human resource management are as follows and are the basis for the questions about human resource management (see [Table 21](#)).

- Knowledge and skills are developed, acquired and provided to execute effective and efficient data quality management.
- Personnel are trained to develop, maintain or enhance knowledge and skills with respect to data quality management.

NOTE Through training, personnel across the organization can understand the importance of data quality, their roles and how their actions affect data quality.

- Personnel are recruited to provide the organization with suitable knowledge and skills to execute effective and efficient data quality management.
- Best practices are identified, shared, reused and enhanced to underpin data quality management throughout the organization.

Table 21 — Questions about human resource management

Organizational capability	Question	Example of proof
Human resource management	Do you develop, acquire, and provide knowledge and skills to execute effective and efficient data quality management?	Existence of a skills base for data quality management
Human resource management	Do you train personnel to develop, maintain or enhance and skills with respect to data quality management?	Existence of training courses
Human resource management	Do you recruit personnel to provide the organization with suitable knowledge and skills to execute effective and efficient data quality management?	Existence of Human resource policy
Human resource management	Do you allocate to an empowered team the roles, responsibilities and authorities to cover all aspects of data quality management?	Existence of control roles, responsibilities, authorities and entitled team

6 Details of the process measurement questionnaire

6.1 Measurement scale

An organization may use a measurement scale by which to assess the degree to which a process has been implemented (see [Table 22](#)).

Table 22 — A measurement scale by which to represent implementation of a process

Ordinal value	Definition	Description	Degree of implementation
N	Not implemented	There is little or no evidence of achievement of implementation.	0 to ≤15 %
P	Partially implemented	There is some evidence of an approach to, and some implementation of, the process. Some aspects of implementation are potentially unpredictable.	>15 % to ≤50 %
L	Largely implemented	There is evidence of a systematic approach to, and significant implementation of, the process. Some weaknesses potentially exist in the process.	>50 % to ≤85 %
F	Fully implemented	There is evidence of a complete and systematic approach to, and full implementation of, the process. No significant weaknesses exist in the process.	>85 % to ≤100 %

6.2 Weighting of the questions

By default, each question has an equally weighting but an organization may choose to vary the weight of each question based on appropriate priorities.

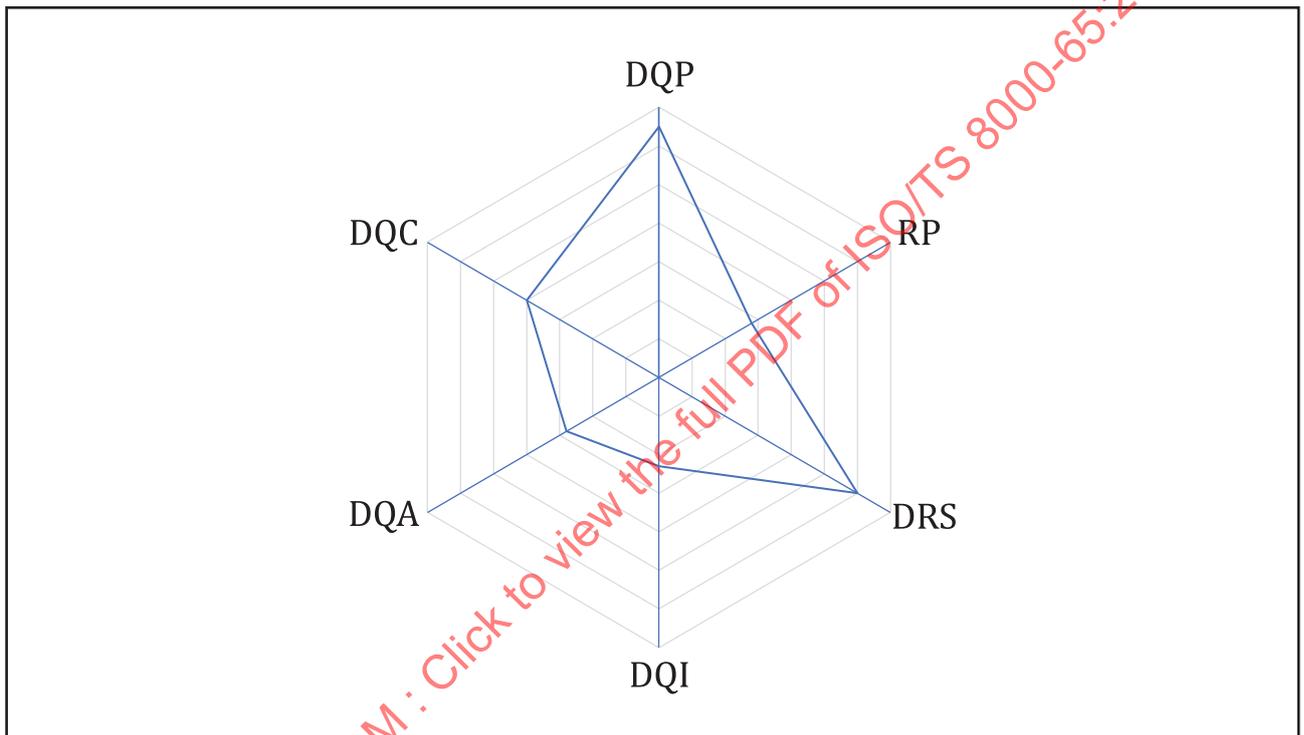
6.3 Visualizing the results

An organization can view the results of an assessment by summarizing against:

- the higher-level processes of ISO 8000-61 (see [Figure 2](#));
- organizational capability (see [Figure 3](#)).

7 Conformance

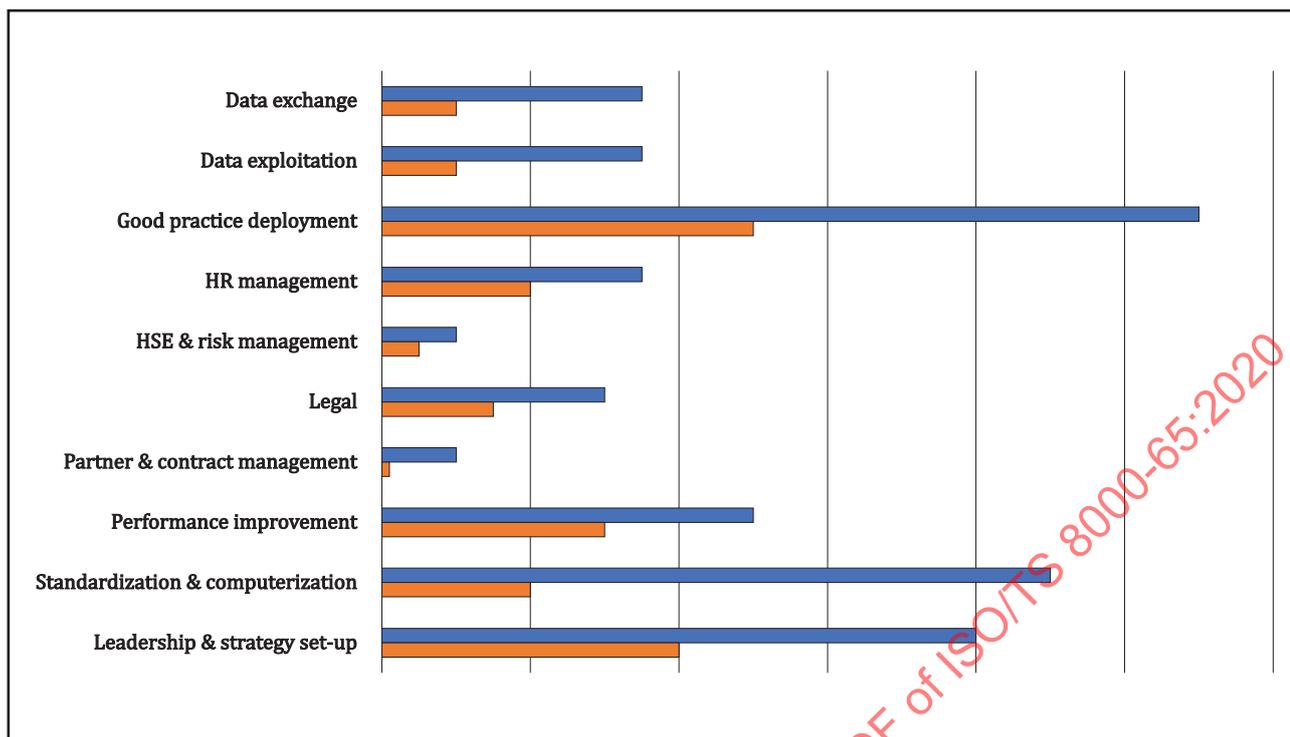
To conform to this document, an organization shall measure data quality management by recording the answers to the questions in [Clause 5](#).



Key

DQP	Data quality planning	DQI	Data quality improvement
DQC	Data quality control	DRS	Data-related support
DQA	Data quality assurance	RP	Resource provision

Figure 2 — An example of reporting assessment results by higher-level process of ISO 8000-61



Key

- target
- actual

NOTE The target value for each capability indicates the organizational priority for that capability.

Figure 3 — An example of reporting assessment results by organizational capability

Annex A (informative)

Information object registration

A.1 Document identification

To provide for unambiguous identification of an information object in an open system, the object identifier

```
{ iso standard 8000 part(065) version(1) }
```

is assigned to this document. The meaning of this value is defined in ISO/IEC 8824-1, and is described in ISO 10303-1.

A.2 Data quality process measurement questionnaire identification

To provide for unambiguous identification of an information object in an open system, the object identifier

```
{ iso standard 8000 part(065) version(1) object(4) data-quality-  
  process-measurement-questionnaire (1) }
```

is assigned to the data quality process measurement questionnaire in this document. The meaning of this value is defined in ISO/IEC 8824-1, and is described in ISO 10303-1.

Annex B (informative)

The collated questions of the process measurement questionnaire

This annex contains the following tables that collect together the questions of the questionnaire:

- all questions in the questionnaire (see [Table B.1](#));
- all questions for the organizational capability of data exchange (see [Table B.2](#));
- all questions for the organizational capability of data exploitation (see [Table B.3](#));
- all questions for the organizational capability of good practice deployment (see [Table B.4](#));
- all questions for the organizational capability of human resource management (see [Table B.5](#));
- all questions for the organizational capability of health and safety executive and risk management (see [Table B.6](#));
- all questions for the organizational capability of legal management (see [Table B.7](#));
- all questions for the organizational capability of partner and contract management (see [Table B.8](#));
- all questions for the organizational capability of performance improvement (see [Table B.9](#));
- all questions for the organizational capability of standardization and computerization (see [Table B.10](#));
- all questions for the organizational capability of leadership and strategy set-up (see [Table B.11](#)).

NOTE [Table B.1](#) is available as an electronic insert at <https://standards.iso.org/iso/ts/8000/-65/ed-1/en/>.

Table B.1 — All questions in the questionnaire

Higher-level process	Process	Organizational capability	Question	Example of proof
Data quality planning	Requirements management	Data exchange	Do you collect and classify data requirements from stakeholders or business partners?	Existence of a data requirements report
Data quality planning	Requirements management	Data exploitation	Do you prioritize and validate data requirements with stakeholders?	Existence of a document signed by the stakeholders
Data quality planning	Data quality strategy management	Leadership and strategy set-up	Do you commit top management to the continual improvement of data quality?	Existence of a data quality chapter in the quality manual or Existence of committees with top management on data quality or Existence of a Chief Data Officer and/or a data quality sponsor in top management
Data quality planning	Data quality strategy management	Leadership and strategy set-up	Did you create a data quality strategy, describing the vision, long-term goals, an implementation roadmap and short-term objectives, which are defined in terms of quantitative outcomes? Do you communicate the data quality strategy throughout the organization?	Document distributed and applied with respect to data quality strategy

Table B.1 (continued)

Higher-level process	Process	Organizational capability	Question	Example of proof
Data quality planning	Data quality strategy management	Good practice deployment	Are you using a framework for establishing and reviewing the data quality strategy?	Existence of a framework
Data quality planning	Data quality strategy management	Leadership and strategy set-up	Do you evaluate results to determine the performance of the data quality strategy?	Existence of a process performance report
Data quality planning	Data quality strategy management	Leadership and strategy set-up	Do you update the strategy according to those results through consultation with stakeholders?	Existence of process performance method and an improvement cycle
Data quality planning	Data quality strategy management	Data exploitation	In the organization, are there indicators that can be used to measure the impact of data quality on delivering the mission of the organization?	Existence of impact measurement indicators for data quality management
Data quality planning	Data quality policy/standards/procedures management	Standardization and computerization	Are appropriate policies for data quality specified, published, known and applied? Are these policies coherent with the data quality strategy?	Existence of a document with fundamental intentions and rules for data quality management in the organization
Data quality planning	Data quality policy/standards/procedures management	Standardization and computerization	Are applicable standards specified, known and applied?	Existence of a list of standards with which to conform
Data quality planning	Data quality policy/standards/procedures management	Standardization and computerization	Are procedures related to data quality specified, published, known and applied?	Existence of business process model for data quality management
Data quality planning	Data quality implementation planning	Good practice deployment	Do you have an implementation roadmap of your data quality processes?	Existence of implementation roadmap as a Gantt chart
Data quality planning	Data quality implementation planning	Leadership and strategy set-up	Do you monitor and update your progress against implementations plans?	Improvement measures using the initial roadmap
Data quality planning	Data quality implementation planning	Leadership and strategy set-up	Do you have a master data integration strategy for the organization?	Existence of a strategy document on data integration

Table B.1 (continued)

Higher-level process	Process	Organizational capability	Question	Example of proof
Data quality control	Provision of data specifications and work instructions	Partner and contract management	Do you define your data specifications for all providers or partners?	Existence of documented data specifications or the names of used standards
Data quality control	Provision of data specifications and work instructions	Good practice deployment	Do you define your work instructions to specify the approach to data processing for data users or operators? NOTE Work instructions are lists of actions.	Existence of up-to-date work instructions
Data quality control	Data processing	Legal	Do you keep a log of all data operations performed by data users or applications?	Existence of a data operations log
Data quality control	Data quality monitoring and control	Health and safety executive and risk management	Do you identify, quantify and prioritize risks against data specifications?	Existence of a risk assessment report
Data quality control	Data quality monitoring and control	Data exploitation	Can you measure the impact of data quality issues in terms of turnover or reduced operational capability?	Existence of a business impact report
Data quality control	Data quality monitoring and control	Performance improvement	Do you identify, analyse, and validate data nonconformities? Do you list their recurrence?	Existence of list of nonconformities, associated corrections and any recurrences
Data quality control	Data quality monitoring and control	Legal	Do you keep logs of actions taken to address data nonconformities?	Existence of a log explaining actions
Data quality control	Data quality monitoring and control	Performance improvement	Do you refine and apply guidelines, rules and procedures to prevent recurrence of data nonconformities?	Update of data quality business process model
Data quality assurance	Review of data quality issues	Good practice deployment	Do you review data quality issues?	Issues have been assigned and considered by the right people
Data quality assurance	Provision of measurement criteria	Good practice deployment	Do you set the basis (quality indicators) on which to perform measurement of data quality and process performance?	Existence of a data quality report framework
Data quality assurance	Measurement of data quality and process performance	Performance improvement	Do you measure data quality and process performance levels?	Existence of a data quality report
Data quality assurance	Measurement of data quality and process performance	Good practice deployment	Across the organization, have you systemized measurement of data quality?	Description of the measurement procedure
Data quality assurance	Evaluation of measurement results	Data exploitation	Do you analyse measurement results to evaluate the impact and to prioritize the necessary response?	Risk evaluation for each item (e.g. financial, health/safety/environmental)

Table B.1 (continued)

Higher-level process	Process	Organizational capability	Question	Example of proof
Data quality improvement	Root cause analysis and solution development	Performance improvement	Do you analyse root causes and develop improvement solutions to eliminate them?	Root cause analysis and solutions with a feasibility or Evaluation using cost-benefit analysis
Data quality improvement	Data cleansing	Good practice deployment	Do you correct data nonconformities and related data?	Detailed specification for data cleansing or Schedule validated with stakeholders or Log of all corrections made to the data
Data quality improvement	Data cleansing	Performance improvement	Do you act to prevent their recurrence?	Positive trends in the data quality indicators
Data quality improvement	Process improvement for data nonconformity prevention	Performance improvement	Do you measure the efficiency of your processes?	Positive trends in the data quality indicators
Data-related support	Data architecture management	Data exchange	Do you define data models to exchange data among different applications and different parts of the organization?	Existence of data models
Data-related support	Data architecture management	Good practice deployment	Do you have a dictionary that is accessible for everyone?	Existence of a data dictionary
Data-related support	Data architecture management	Good practice deployment	Do you give the data life cycle when defining data?	Existence of a data model lifecycle or CRUD (Create, Read, Update and Delete) or SIPOC (Supplier, Input, Process, Output, Customer)
Data-related support	Data architecture management	Standardization and computerization	Do you have common data modelling rules and tools across the organization?	Existence of a data modelling structure (rules and tools)
Data-related support	Data architecture management	Standardization and computerization	Across the organization (or at project level when appropriate), is there a control process covering enrichment of a common data dictionary, and definition of the life cycles, when creating a new project or deleting an application?	Existence of a control process

Table B.1 (continued)

Higher-level process	Process	Organizational capability	Question	Example of proof
Data-related support	Data architecture management	Standardization and computerization	When data changes, have processes been implemented across the organization (or at project level when appropriate) to convert the data models concerned?	Existence of data models' conversion processes
Data-related support	Data architecture management	Standardization and computerization	Are your data management tools (including extract/transform/load) connected to data dictionaries and data models?	Existence of data management tools connected to dictionaries and data models
Data-related support	Data transfer management	Legal	Do you log, monitor and control data transfers?	Data transfer logs
Data-related support	Data operations management	Standardization and computerization	Do you exchange data in standard format with stakeholders and third parties?	Existence of a list of used standards to address data related topics
Data-related support	Data operations management	Standardization and computerization	Are there procedures for creation of master and reference data? If so, are those procedures implemented across the organization?	Documentation of these procedures: data formats, fields to complete in the database, etc.
Data-related support	Data operations management	Standardization and computerization	Across the organization, have processes been set up to manage master and reference data?	List of processes to check
Data-related support	Data operations management	Data exchange	Across the organization, do managed repositories feed the applications that use master and reference data?	Ratio of number of applications sharing the same reference data to number of applications having their own reference data
Data-related support	Data operations management	Data exchange	Is there a procedure enabling each new project to identify the repository with which to set up connections when needed?	Existence of the procedure
Data-related support	Data security management	Good practice deployment	Do you set data security criteria?	Up-to-date policy, standards, controls and procedures for data security
Data-related support	Data security management	Good practice deployment	Do you manage data access authorization?	List of data access privileges and responsibilities for users and list of data access by users

Table B.1 (continued)

Higher-level process	Process	Organizational capability	Question	Example of proof
Data-related support	Data security management	Good practice deployment	Do you audit data security?	Evaluation of the performance of data security and list of actions to improve confidentiality, integrity and availability of data
Resource provision	Data quality organization management	Leadership and strategy set-up	Are long-term data governance powers granted across the organization? (For example, unit, mission, Chief Data Officer, project, etc.)	Existence of data governance specific initiatives
Resource provision	Data quality organization management	Leadership and strategy set-up	Do you hold committees or team meetings to make decisions with respect to data quality?	Existence of meeting reports
Resource provision	Human resource management	Human resource management	Do you develop, acquire, and provide knowledge and skills to execute effective and efficient data quality management?	Existence of a skills base for data quality management
Resource provision	Human resource management	Human resource management	Do you train personnel to develop, maintain or enhance and skills with respect to data quality management?	Existence of training courses
Resource provision	Human resource management	Human resource management	Do you recruit personnel to provide the organization with suitable knowledge and skills to execute effective and efficient data quality management?	Existence of human resource policy
Resource provision	Human resource management	Human resource management	Do you allocate to an empowered team the roles, responsibilities and authorities to cover all aspects of data quality management?	Existence of control roles, responsibilities, authorities and entitled team

Table B.2 — All questions for the organizational capability of data exchange

Higher-level process	Process	Question	Example of proof
Data quality planning	Requirements management	Do you collect and classify data requirements from stakeholders or business partners?	Existence of a data requirements report
Data-related support	Data architecture management	Do you define data models to exchange data among different applications and different parts of the organization?	Existence of data models
Data-related support	Data operations management	Across the organization, do managed repositories feed the applications that use master and reference data?	Ratio of number of applications sharing the same reference data to number of applications having their own reference data