QUALITY MANAGEMENT

Quality Management

Chapter 08

8.1 Introduction

8.1.1 Overview

This chapter discusses quality management for a national statistical office (NSO), including general quality management principles, the development and administration of a statistical quality assurance framework, definition and implementation of quality monitoring and evaluation, user surveys, the labelling of official statistics, the quality certification of the NSO, and the relationship of quality management to other strategic initiatives, such as risk management.

Quality management is essential in building the value of official statistics and a key element in increasing user confidence. NSOs should have institutional arrangements that ensure compilation of high quality, objective and independent statistics that are not influenced by any interest. As stated in the *ECE's Recommendations for Promoting, Measuring and Communicating the Value of Official Statistics* (🔗), the unique value of official statistics lies in the rigorous quality criteria and professional ethics of statistical production in accordance with the Fundamental Principles of Official Statistics (🔗). The benefits of official statistics compared to data from other sources flow from the application of these principles.

A **quality management framework** takes, as its initial starting point, the mission, vision, values and strategic objectives of an NSO. Its basic objective is to build quality into all processes within the organization that are pertinent to its core business of producing statistics. As this requires a significant investment of resources, such a framework has to be justified in terms of benefits it brings, which may be articulated as follows.

- It provides a basis for creating and maintaining a culture of quality within the organization and, more generally, within the national statistical system (NSS).

- It is focused on users and their needs and thus calls for regular review of changes in society and among stakeholders that may affect the work of the organization.

- It provides a systematic mechanism for ongoing identification of quality problems and possible actions for their resolution, whether by incremental improvement or re-engineering.

- It supports a continuous review of processes and quality improvement actions.

- It stimulates staff participation, engagement and interaction throughout the organization and the NSS.

- It documents guidelines, processes and tools for assuring quality and for training statisticians.

- It draws attention to synergies and interconnections within the organization and helps to integrate processes, systems and tools.

- It gives greater transparency to the processes by which quality is assured and reinforces the image of the organization as a credible provider of good quality statistics.

- It is the mechanism for the promotion of quality assurance across the NSS.

- It is the mechanism for the exchange of ideas on quality management with international statistical organizations.

More generally, a quality management framework is a mechanism by which an NSO can ensure that, given the resources at its disposal, the value of the statistics it produces is optimised. As further stated in the *Recommendations for Promoting, Measuring and Communicating the Value of Official Statistics* (🔗) referenced above:

- *"Producers of official statistics are by no means the sole supplier of information. The world is awash with data. There is a growing confusion between official statistics and less reliable data. This may give more weight to opinions and impressions. Official statistics need to stand out as a trustworthy source of information. This is also crucial for persuading respondents about the importance of replying to statistical surveys…"*

- *"Demand for statistics is rapidly growing. An increasingly globalized and interconnected world creates new needs for accurate information about economies and societies…"*

A quality management framework is the mechanism by which an NSO can ensure that it recognises such opportunities and challenges as they arise and can respond to them.

8.1.2 Terminology

It is important to establish a common understanding of the terminology as quality-related terms tend to be used with a variety of meanings. For example, consider **quality management framework**, **quality management system**, **quality assurance framework**, and **data quality assessment framework**. Are these all the same thing? If they differ, how do they differ? The following paragraphs define the key terms used in the chapter. The starting point is the ISO 9000:2015 Quality Management System (🔗) standard (further described in *Chapter 8.2 — Generic quality management systems and other relevant standards*). The definitions are then specialised to the specific context of NSOs, drawing heavily on the United Nations National Quality Assurance Frameworks Manual for Official Statistics (UN NQAF Manual) (🔗), which is elaborated in *Chapter 8.3 — Quality assurance frameworks, guidelines, and tools*.

Quality: degree to which a set of inherent characteristics of an object fulfils requirements.

This rather succinct, even opaque, definition from ISO 9000:2015 is widely used. **Inherent** means **existing** in the object, as opposed to **assigned** (like a price). The **object** may be anything that is perceivable or conceivable. Specifically, in the context of an NSO, the object may be a **statistical output**, the **statistical process** that produced it, the **institutional environment** housing the process, or the **whole statistical system**.

> A simpler characterisation of quality is fit for use or fit for purpose.

It is users' needs that define output quality. Different users may have different needs that must be balanced against each other to provide the quality concept with concrete content. Over the past 20 years, NSOs have arrived at the consensus that quality is multidimensional and that there is no single measure of quality. Thus, the definition of output quality is operationalized by specifying a set of dimensions that characterize it, typically **relevance, accuracy and reliability, timeliness and punctuality**; **accessibility and clarity**; and **coherence and comparability**, as further discussed in *Chapter 8.3 — Quality assurance frameworks, guidelines, and tools*.

- **Quality management**: coordinated activities to direct and control an organization with regard to quality. Quality management includes establishing quality policies and objectives, and processes to achieve these objectives through quality planning, quality assurance, quality control, and quality improvement.

- **Quality management system**: a set of interrelated or interacting elements of an organization to establish quality policies and quality objectives, and processes to achieve those objectives. In the context of an NSO, a quality management system is more commonly referred to as a quality management framework, or simply a quality framework.

- **Generic quality management system**: a quality management system model or standard that can be applied to any type of organization. Examples are the ISO 9001:2015 Quality Management System - Requirements (🔗) and the European Foundation for Quality Management (EFQM) Excellence Model (🔗), both of which are further described in *Chapter 8.2 — Generic quality management systems and other relevant standards*.

- **Quality management principles**: a comprehensive set of principles on which a quality management system is based. The most widely used articulation of quality management principles is included in the ISO 9000:2015 and accompanying documents In the context of NSOs, and in this chapter, a distinction is made between general quality

management principles, which are associated with an organization as a whole, and statistical quality principles, which are associated with the core statistical infrastructure and processes.
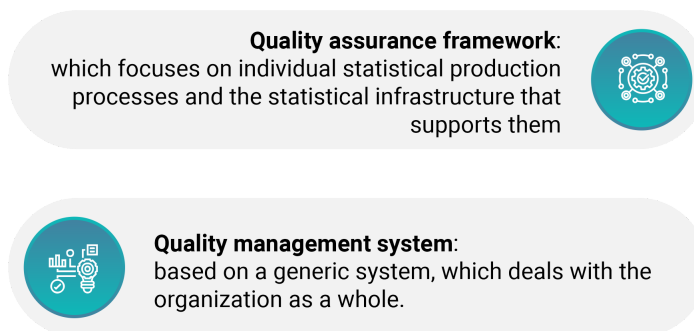
- **Quality assurance**: the part of quality management focused on providing confidence that needs or expectations regarding quality will be met. Quality assurance provides an organization's guarantee that the product and service it offers meet accepted quality standards. In the context of an NSO, it comprises a planned and systematic pattern of actions necessary to provide confidence that a product, and the process that produces it, conform to established requirements. It is achieved by identifying statistical quality principles, by applying them to the core statistical infrastructure, processes, and outputs, and to the institutional environment and whole statistical system within which they are embedded, and by measuring the extent of their achievement.

- **Quality assurance framework**: the procedures and systems that support quality assurance within an organization. The term quality assurance framework is used in the context of NSOs to mean the part of the quality management framework that provides confidence that the stated needs or expectations of users are being met. It is based on the definition of quality, the statistical quality principles, and the methods and tools that are used to ensure the principles are implemented. A quality assurance framework together with the procedures for application of general quality management principles constitute a quality management framework.

- **Quality assessment**: the part of quality assurance that focuses on assessing the extent to which quality requirements have been fulfilled. In the context of NSOs, quality assessment, quality evaluation, and quality review are regarded as synonyms and for brevity are referred to simply as evaluation, the term used in the Generic Statistical Business Process Model (GSBPM).

8.1.3 Developing a quality management framework

In line with the definitions above, development of a quality management framework involves consideration of two elements.

The first and most significant element is a **quality assurance** framework that specifically addresses the core business of the NSO. Many countries have developed their own individual **national** quality assurance framework (NQAF), often making use of an already existing generic quality assurance framework or taking advantage of NQAFs of other countries.

The second element is focused on implementing **general quality management principles** for the organization as a whole. It concentrates on promoting a culture that ensures quality. It can be based on a generic quality management system, which may then be used as the basis for quality certification of the organization. Alternatively, it can be achieved simply by supplementing the NQAF with general quality management principles. Most NSOs choose this latter approach and define a single quality management framework embracing both elements, typically still referring to it as a **quality assurance framework**. A few NSOs choose to separate the elements and introduce two parallel systems:

Quality assurance framework:
which focuses on individual statistical production processes and the statistical infrastructure that supports them

Quality management system:
based on a generic system, which deals with the organization as a whole.

- **a quality assurance framework**, which focuses on individual statistical production processes and the statistical infrastructure that supports them; and

- **a quality management system**, based on a generic system, which deals with the organization as a whole.

If an NSO makes the latter choice, it is typically because it wants the discipline of seeking certification for the entire organization based on an international or supranational quality management system standard such as ISO 9001 or the EFQM Excellence Model.

8.2 Generic quality management systems and other relevant standards

This section summarises the generic quality management systems that an NSO should consider in formulating its quality management approach, whether it builds general quality management principles into its quality assurance framework or makes use of a separate generic quality management system. The chapter also references some standards that are closely related to quality management and should be considered, in particular standards associated with **risk management** and **metadata management**.

8.2.1 ISO 9000 family of quality standards

The International Organization for Standardization (ISO) is the most prolific source of international standards, including quality-related standards, in the world.

> Particular prominence is given in this document to the ISO 9000 family of quality standards as they articulate general quality management principles and provide the basis for quality certification.

The members of the family are.

- ISO 9000:2015 Quality management systems – Fundamentals and vocabulary (🔗);

- ISO 9001:2015 Quality management systems – Requirements (🔗);

- ISO 9004:2018 Quality management – Quality of an organization - Guidance to achieve sustained success (🔗).

They form a family in the following sense: ISO:9001 and ISO 9004 each depend upon ISO 9000 for underlying quality principles and vocabulary; jointly ISO 9000 and ISO 9001 constitute a general quality management system (although actual certification is in terms of ISO 9001); and implementation of ISO 9004 typically follows ISO 9001.

The standards have to be purchased from ISO. However, ISO 9000:2015 is accompanied by two explanatory documents, both of which are freely available, namely the ISO 9000 Glossary and Quality Management Principles (🔗).

As the standards are expressed in generic terms and not always easy to understand, ISO 9000:2015 Plain English Definitions (🔗), written by Praxiom, is another useful supporting document.

ISO 9000: 2015 Quality management systems – Fundamentals and vocabulary

ISO 9000:2015 (🔗) provides the fundamental concepts, principles and vocabulary used for the family of quality standards. It is the starting point for the definition of quality-related terms in *Chapter 8.1.3 — Developing a quality management framework*. It defines and describes seven **quality management** principles as follows.

Principle 1 – Customer focus: Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations.

Principle 2 – Leadership: Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives.

Principle 3 – Engagement of people: People at all levels are the essence of an organization, and their full involvement enables their abilities to be used for the organization's benefit.

Principle 4 – Process approach: A desired result is achieved more efficiently when activities and related resources are managed as a process.

Principle 5 – Improvement: Improvement of the organization's overall performance should be a permanent objective of the organization.

Principle 6 – Evidence-based decision making: Effective decisions are based on the analysis of data and information.

Principle 7 – Relationship management: An organization and its external providers (suppliers, contractors, service providers) are interdependent, and a mutually beneficial relationship enhances the ability of both to create value.

ISO Quality Management Principles (🔗) provides the rational, key benefits and action items for each of the seven principles. Many NSOs have been influenced by this expression of general quality management principles, also referred to as total quality management (TQM).

ISO 9001: 2015 Quality management systems – Requirements

ISO 9001:2015 (🔗) specifies requirements for a quality management system when an organization (a) needs to demonstrate its ability to consistently provide products and services that meet customer and applicable statutory and regulatory requirements, and (b) aims to enhance customer satisfaction through the effective application of the system, including

processes for improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

The standard incorporates the notions of the **plan-do-check-act (PDCA) cycle** and the **process-based approach** (see quality management principle four above). It also aligns with risk-based thinking. It comprises the ten sections of which the first three provide context and the following seven provide the basis for audit and certification.

- **Context**: Scope, Normative references, Terms and definitions;

- **Audit and Certification**: Context of the organization, Leadership, Planning, Support, Operation, Performance evaluation, and Continual improvement.

Several NSOs have adopted ISO 9001 as a quality management system and applied for ISO 9001 certification. They include the Statistical Office of the Slovak Republic, Statistics Lithuania, the Philippine Statistical Authority, and the Palestine Bureau of Statistics.

ISO 9004: 2018 Quality management - Quality of an organization - Guidance to achieve sustained success

ISO 9004:2018 (🔗) gives guidelines for enhancing an organization's ability to achieve sustained success, consistent with the quality management principles in ISO 9000:2015. It provides a self-assessment tool to review the extent to which an organization has adopted the concepts articulated in the standard. It is not a certification standard. It does not appear to have been greatly adopted by NSOs.

8.2.2 ISO 10004: 2018 Quality management – Customer satisfaction

ISO 10004:2018 (⌗) provides guidance in defining and implementing processes to monitor and measure customer satisfaction.

It is not a certification standard. It is focused on just one aspect of quality management, namely, customer satisfaction. It has potential for application within NSOs, where customers are more commonly referred to as users.

8.2.3 ISO 20252: 2012 Market, opinion and social research – Vocabulary and service requirements

ISO 20252:2012 establishes terms and definitions and service requirements for organizations and professionals conducting market, opinion and social research. It covers the management and delivery of research, data management, analysis, document retention, security, recruitment and the effectiveness of the quality system. It is a certification standard.

The standard is evidently quite closely tuned to the core business of NGOs and thus, in principle at least, is of potential use in developing a quality management framework. However, no NSO has reported adopting it or using it for certification.

8.2.4 ISO 31000:2018 Risk Management

Risk is a necessary part of doing business, and, in a world where enormous amounts of data are being processed at increasingly rapid rates, identifying and mitigating risks is a challenge for an NSO. As previously mentioned, ISO 9001 is aligned with risk-based thinking. Thus, ISO 31000 (⌗) is included here to draw attention to its utility in building a quality management framework.

ISO 31000 is an open, principles-based standard, not a basis for certification. It recommends risk management as a part of an organization's structure, objectives, strategy, processes, and activities. It provides guidance for organizations in developing a risk management strategy to identify and mitigate risks. It places emphasis on the involvement of senior management and the integration of risk management into the organization. Its overarching goal is to develop a risk management culture where employees and stakeholders are aware of the importance of monitoring and managing risk. It recommends having a policy that assigns authority, responsibility and accountability for risk management at the appropriate levels within the organization and that ensures the necessary resources are allocated.

It is becoming increasingly clear from the above description that risk management and quality management should be harmonised and developed in tandem, if not actually merged. The notion of quality gates discussed in *Chapter 8.5.6 — Monitoring quality and applying quality gates* is an application of risk management.

8.2.5 European Foundation for Quality Management (EFQM) Excellence Model

The EFQM Excellence Model (⌗) refers to eight fundamental concepts of excellence, which lay the foundation for achieving sustainable excellence in any organization. They are:

- Succeeding through the talent of people;
- Sustaining outstanding results;
- Adding values for customers;
- Creating a sustainable future;
- Developing organizational capacity;
- Harnessing creativity and innovation;
- Leading with vision, inspiration and integrity;
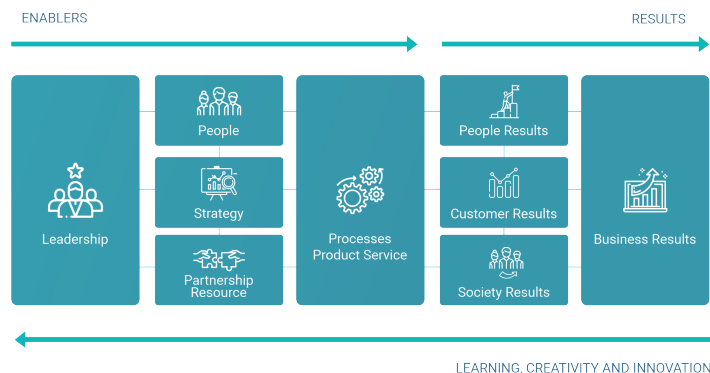
- Managing with agility.

These fundamental concepts are entirely equivalent to the ISO 9000 quality management principles. They are an alternative expression of the principles.

The Excellence Model provides a basis for certification using nine criteria, five of which are **enablers** (covering what an organization does and how it does it) and four of which are **results** (covering what an organization achieves).

- The enabler criteria are: Leadership; People; Strategy; Partnerships and Resources: and Processes, Products and Services.

- The results criteria are: People results; Customer results; Society results; and Business results.

Each criterion is supported by a number of **criterion parts**, which describe what can be seen in excellent organizations and which are further divided into **guidance points**. The Excellence Model is well known to NSOs in Europe.

8.2.6 Lean, Six Sigma, and Lean-Six Sigma

Lean, Six Sigma, and Lean-Six Sigma are not proprietary products like the ISO 9000 quality family or the EFQM Excellence Model. They are approaches to quality and performance management. They are used in national statistical offices in Ireland, the Netherlands and Scandinavian countries.

Lean - concepts and coverage

Lean is about minimizing cost, cycle time, and waste, and maximizing value. At the kernel of Lean is systems thinking that the value of a system or process is more than the value of its individual components; that value is affected not only by individual activities but also by the way these activities work together.

Though Lean is focused on efficiency rather than quality, it is relevant here as quality management includes efficiency considerations. Specifically, inefficient use of resources results in fewer resources available for quality assurance.

Six Sigma – concepts and coverage

Six Sigma is a business management strategy. A Six Sigma process is one in which a very high proportion of the products manufactured are free of defects. A Six Sigma project follows a defined sequence of steps and has quantified targets, which can be financial (like cost reduction) or driven by customer requirements. Six Sigma seeks to improve the quality of process outputs by identifying and removing the causes of defects (interpreted as errors in the case of an NSO) and minimizing process variability. It involves the use of quality management related methods and the creation of a team of people within the organization who are experts in these methods.

Lean Six Sigma - concepts and coverage

Lean and Six Sigma are complementary and are combined in Lean Six Sigma, which has been an acknowledged certification standard since 2004. Over the past decade, it has been further improved by incorporating new ideas and tools. Further details are available in *A Brief Introduction to Lean, Six Sigma and Lean Six Sigma* (🔗).

8.2.7 Balanced Scorecard

The Balanced Scorecard is a strategic planning and management approach that is used extensively in business and industry, government, and non-profit organizations worldwide, including NSOs:

- to build a consensus regarding the organization's vision and strategies;

- to align business activities, the vision and strategy;

- to improve internal and external communications;

- monitor organizational performance against strategic goals (the scorecard).

  Whilst the Balanced Scorecard has broader goals than quality management and cannot be considered a quality management system, it is closely related.

Quality management builds on organizational mission, vision and strategies. It includes improvement in communications with users and providers, and strategic goals often include quality goals.

Further details are available in *Total Quality Management and Balanced Scorecard, A Comparative Analysis* (🔗).

8.3 Quality assurance frameworks, guidelines, and tools

Chapters 8.3.1 – 8.3.3 describe generic quality assurance frameworks, quality guidelines and other quality tools developed by international and supranational statistical organizations for use by NSOs.

- **Chapter 8.3.1** summarises the generic UN National Quality Assurance Framework (NQAF), which is a core feature of the UN Quality Assurance Frameworks Manual for Official Statistics developed under the guidance of the UN Statistical Division.

- **Chapter 8.3.2** summarises the quality-related standards and tools developed within the European Statistical System (ESS).

- **Chapter 8.3.3** includes quality standards and codes of statistical practice developed by other international and supranational organizations, including the IMF and the UN statistical commissions.

- **Chapter 8.4** describes some specific quality assurance frameworks, guidelines and tools that have been developed by individual NSOs. Obviously, not all NSO quality frameworks and tools can be included. Those described are ones that are well documented, that are readily accessible via the Internet, and that can be seen as representing good practice.

8.3.1 United Nations National Quality Assurance Frameworks Manual

8.3.1.1 Objectives, structure and content

The *United Nations National Quality Assurance Frameworks Manual for Official Statistics (UN NQAF Manual)* (🔗), including recommendations, framework and implementation guidance, was adopted by the UNSC in 2019. It is directed at assuring the quality of official statistics throughout an entire NSS. It builds on and replaces the generic *United Nations National Quality Assurance Framework* (UN-NQAF) template and guidelines adopted by the UNSC in 2012.

> The Manual is the single most useful guidance document for an NSO that does not have a quality assurance framework and would like to develop one, or for an NSO that wants to revise and improve its framework.

It does not aim to replace existing statistical quality assurance frameworks and guidelines. Producers of official statistics that are already fully engaged in quality assurance in accordance with existing quality frameworks may view the Manual as a reference that supports what they are already doing, and as a source of information on the application of quality assurance in different situations.

There has been a significant uptake of ideas from the NQAF by developed and developing NSOs alike, including, for example, Lithuania, Poland, Palestine and Jamaica.

The structure of the Manual is shown in Figure 8.

Part	Chapter	Title
Introduction	Chapter 1	Contents of the Manual
Recommendations	Chapter 2	Recommendations on quality assurance for official statistics - relating quality assurance to the Fundamental Principles of Official Statistics
UN-NQAF	Chapter 3	United Nations National Quality Assurance Framework: principles and requirements
	Chapter 4	Assessment tools and risk management
	Chapter 5	Development and implementation of a national quality assurance framework
Implementation	Chapter 6	Implementation of quality assurance within the NSS
	Chapter 7	Quality assurance for statistics compiled from different data sources
	Chapter 8	Quality assurance for data and statistics on SDG indicators
Global System & References	Chapter 9	Quality assurance in the global statistical system
UN NQAF Elements	Annex	Detailed list of elements to be assured

Fig. 8.1: Structure of the UN NQAF Manual for Official Statistics

8.3.1.2 UN NQAF principles, requirements and elements

Chapter 3 of the Manual presents 19 **UN NQAF principles, and the requirements** for their implementation, organized in **four levels**, as indicated below. Each requirement is complemented in the annex to the Manual by a detailed list of elements to be assured.
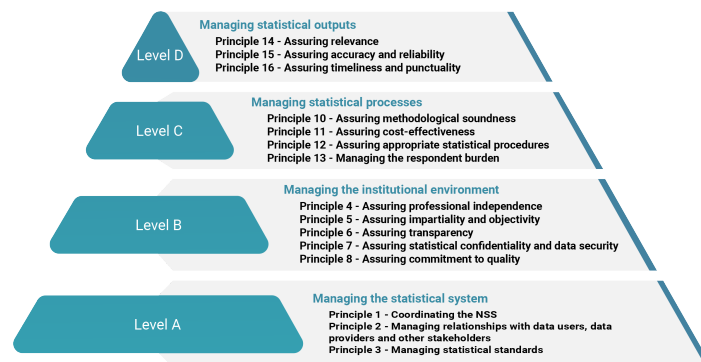
- **Level A: Managing the statistical system**: Coordination of the NSS and managing relations with all stakeholders is a precondition for the quality and efficient production of official statistics. Ensuring the use of common statistical standards throughout the system is an important aspect of this management.

  – **Principle 1 - Coordinating the NSS**: coordination of the work of the members of the NSS is essential for improving and maintaining the quality of official statistics.

  – **Principle 2 - Managing relationships with data users, data providers and other stakeholders**: the statistical agencies should build and sustain good relationships with all their key stakeholders, including users, data providers, funding agencies, senior government officials, relevant community organizations, academia and the media. The statistical agencies should have access to all data necessary to satisfy the information needs of society in an effective and efficient way.

  – **Principle 3 - Managing statistical standards**: standards refer to the full set of statistical concepts, definitions, classifications and models, methods and procedures used to achieve the harmonised treatment within and across processes and across time and space. The use of standards promotes the consistency and efficiency of statistical systems at all levels.

- **Level B: Managing the institutional environment:** The quality of the institutional environment affects the quality of the processes it embraces and the outputs they produce.

  – **Principle 4 - Assuring professional independence:** NSOs should develop, produce and disseminate statistics without any political or other interference or pressure from other government agencies or policy, regulatory or administrative departments and bodies, the private sector or any other persons or entities. Such professional independence and freedom from inappropriate influence ensure the credibility of official statistics. This applies to the national statistical office and to other producers of official statistics.

  – **Principle 5 - Assuring impartiality and objectivity**: statistical agencies should develop, produce and disseminate statistics respecting scientific independence and in a way that is professional, impartial and unbiased, and in which all users are treated equitably.

  – **Principle 6 - Assuring transparency**: NSOs' policies and management practices, and the terms and conditions under which their statistics are developed, produced and disseminated and, if applicable, subsequently revised (including the legal basis and purposes for which the data are required), are documented and available to users, respondents, owners of source data and the public.

  – **Principle 7 - Assuring statistical confidentiality and data security**: NSOs should guarantee that the privacy of data providers (persons, households, enterprises and other data providers) will be protected and that the information they provide will be kept confidential, will not be able to be accessed by unauthorized internal or external users and will be used for statistical purposes only.

- **Principle 8 - Assuring commitment to quality**: NSOs should be dedicated to assuring quality in their work, and systematically and regularly identify strengths and weaknesses to continuously improve the process and product quality.

- **Principle 9 - Assuring adequacy of resources**: the financial, human, and technological resources available to NSOs should be adequate both in magnitude and quality, and sufficient to meet their needs regarding the development, production and dissemination of statistics.

- **Level C: Managing statistical processes**: International standards, guidelines and good practices are fully observed in the statistical processes the NSO uses to develop, produce and disseminate official statistics. The credibility of the statistics is enhanced by a reputation for good management and efficiency.

  - **Principle 10 - Assuring methodological soundness**: in developing and producing statistics, NSOs should use sound statistical methodologies based on internationally agreed standards, guidelines or best practices.

  - **Principle 11 - Assuring cost-effectiveness**: NSOs should assure that resources are effectively and efficiently used. They should be able to explain to what extent set objectives were attained, that the results were achieved at a reasonable cost and are consistent with the principal purposes of the statistics.

  - **Principle 12 - Assuring appropriate statistical procedures**: effective and efficient statistical procedures, underpin quality and should be implemented throughout the statistical production chain.

  - **Principle 13 - Managing the respondent burden**: individuals, households or businesses that provide the data upon which statistical products are based are fundamental contributors to the quality of outputs. The requirement to collect data should be balanced against production costs and the burden placed on respondents. Mechanisms to maintain good relationships with providers of data and to proactively manage the respondent burden are essential to improving quality.

- **Level D: Managing statistical outputs**: Statistics serve the needs of national governments, research institutions, businesses, the general public and the international community.

  - **Principle 14 - Assuring relevance**: statistical information should meet the current and/or emerging needs and expectations of its users. Without relevance, there is no quality. However, relevance is subjective and depends upon the varying needs of users. The NSOs challenge is to weigh and balance the conflicting needs of current and potential users to produce statistics that satisfy the most important and highest priority needs within the given resource constraints.

  - **Principle 15 - Assuring accuracy and reliability**: NSOs should develop, produce and disseminate statistics that accurately and reliably portray reality. The accuracy of statistical information reflects the degree to which the information correctly describes the phenomena it was designed to measure, namely, the degree of closeness of estimates to true values.

  - **Principle 16 - Assuring timeliness and punctuality**: NSOs should minimize the delays in making statistics available. Timeliness refers to how quickly after the reference date or the end of the reference period, the outputs are made available to users. Punctuality refers to whether outputs are delivered on the promised, advertised or announced dates.

  - **Principle 17 - Assuring accessibility and clarity**: NSOs should ensure that the statistics they develop, produce and disseminate can be found and obtained without difficulty, are presented clearly and in such a way that they can be understood, and are available and accessible to all users on an impartial and equal basis in various convenient formats in line with open data standards. Provision should be made for allowing access to microdata for research purposes, in accordance with an established policy that ensures statistical confidentiality.

  - **Principle 18 - Assuring coherence and comparability**: NSOs should develop, produce and disseminate statistics that are consistent, meaning it should be possible to combine and make joint use of related data, including data from different sources. Furthermore, statistics should be comparable over time and between areas.

– **Principle 19 - Managing metadata**: NSOs should provide information covering the underlying concepts and definitions of the data collected and statistics produced, the variables and classifications used, the methodology of data collection and processing, and indications of the quality of the statistical information—in general, sufficient information to enable the user to understand all of the attributes of the statistics, including their limitations.

8.3.1.3 NQAF implementation

Chapters 4 to 8 of the UN NQAF Manual deal with all aspects of implementation.

- **Chapter 4** lists the various tools and instruments for quality assessment, including a section on risk management;

- **Chapter 5** is concerned with the development and implementation of an NQAF at an NSO or another statistical organization;

- **Chapter 6** discusses the role of NSS-wide bodies in the implementation of an NQAF throughout the NSS;

- **Chapter 7** approaches quality assurance from the perspective of the data source being used, which is particularly pertinent in the discussion of new data sources; and

- **Chapter 8** introduces quality assurance for statisticians involved in the compilation of SDG indicators.

8.3.1.4 Quality assurance in the global system

Chapter 9 of the UN NQAF Manual provides reference materials for statisticians who are interested in the links between quality assurance at the national and global level.

It discusses collaboration within the global statistical system in assuring data quality at the global level, taking into consideration the need for international comparability of data, especially in the context of the compilation of the indicators for monitoring progress towards national, regional and global goals and targets of the 2030 Agenda for Sustainable Development.

8.3.2 European Statistical System – quality management standards, guidelines and tools

The European Statistical System (ESS) comprises the NSOs of 27 European Union (EU) Member States, four EFTA countries, and Eurostat.

The ESS is a prolific source of quality-related regulations, standards, guidelines and tools, as summarised in the following sections.

For an NSO in an EU Member State or EFTA country, these documents are the natural starting point and basis for developing a quality assurance framework.

European legislation and regulations relating to quality

The Amended Regulation (EC) No 223/2009 on European Statistics (🔗) includes two articles on quality:

- **Article 11**: The ES CoP shall aim at ensuring public trust in European statistics by establishing how European statistics are to be developed, produced and disseminated in conformity with the statistical principles as set out in Article 2(1) and best international statistical practice. The CoP shall be reviewed and updated as necessary by the ESS Committee.

- **Article 12**: To guarantee the quality of results, European statistics shall be developed, produced and disseminated on the basis of uniform standards and harmonised methods. In this respect, the following quality criteria shall apply: i) relevance, ii) accuracy, iii) timeliness, iv) punctuality, v) accessibility and clarity, vi) comparability, and vii) coherence.

Specific quality requirements, such as target values and minimum standards for the statistical production, may be laid down in sectoral legislation.

The Member States shall provide the Commission (Eurostat) with reports on the quality of the data transmitted. The Commission (Eurostat) shall assess the quality of data transmitted and shall prepare and publish reports on the quality of European statistics.

The Inventory of regulations in the field of statistics containing provisions on quality and quality reporting (2023) (🔗) comprises a list of domain-specific regulations, each of which contains a quality management reference or references. The list is currently being updated.

European Statistics Code of Practice (ES CoP)

The ES CoP has been, arguably, the most influential statistical quality-related document in the last 20 years.
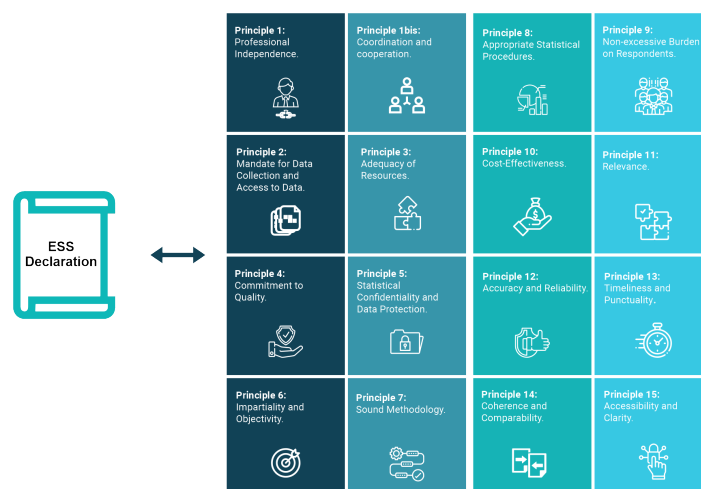
It was most recently updated in November 2017. It is the cornerstone of ESS quality management. It is a self-regulatory instrument. It includes the ESS Quality Declaration and 16 statistical quality principles.

- **ESS Quality Declaration**: "The European Statistical System is a partnership in which Eurostat and the national statistical authorities of each EU Member State and EFTA country cooperate. Together, our mission is to provide independent, high-quality statistical information at European, national and regional levels and to make this information available to everyone for decision-making, research and debate…

    We operate under a strict legal regime supplemented by a robust, world-class and self-regulatory quality framework, the backbone of which is the European Statistics Code of Practice. Our compliance with the Code of Practice is periodically assessed by means of review mechanisms and strict follow-up of the improvement actions identified.

    We see quality as the basis of our competitive advantage in a world experiencing a growing trend of instant information which often lacks the necessary proof of quality…

    We are committed to statistical excellence by systematically identifying our strengths and weaknesses, as well as related risks which we duly take into account by the continuous development of our common quality framework…"

- **ES CoP Principles**: The 16 ES CoP principles, reproduced below, are closely related to the 19 UN NQAF principles. Some are essentially identical. Collectively they cover the same ground. This is not at all surprising as the initial (2012) version of the UN NQAF drew on the ES CoP (2011), and neither set of principles has been greatly changed in subsequent revisions.

    The 16 principles are organized into three groups, covering the **a) institutional environment**, **b) statistical processes**, and **c) statistical output**. These groups are closely related to the four levels of the UN NQAF, the main difference being that the ES CoP institutional environment group includes the UN NQAF statistical system and institutional environment levels.

Each ES CoP principle is exemplified by **indicators** of best practices and standards (not included here) that provide guidance and reference material for reviewing ES CoP implementation.

- **Institutional Environment**
- Principle 1: Professional Independence
- Principle 1bis: Coordination and cooperation
- Principle 2: Mandate for Data Collection and Access to Data
- Principle 3: Adequacy of Resources
- Principle 4: Commitment to Quality
- Principle 5: Statistical Confidentiality and Data Protection
- Principle 6: Impartiality and Objectivity
- **Statistical Processes**
- Principle 7: Sound Methodology
- Principle 8: Appropriate Statistical Procedures
- Principle 9: Non-excessive Burden on Respondents
- Principle 10: Cost-Effectiveness
- **Statistical Output**
- Principle 11: Relevance.
- Principle 12: Accuracy and Reliability
- Principle 13: Timeliness and Punctuality
- Principle 14: Coherence and Comparability
- Principle 15: Accessibility and Clarity

For EU Member States and EFTA countries, the ES CoP is the cornerstone of the quality assurance framework. It may be used without change, or it may be incorporated in modified form, in a national statistical code of practice, as, for example, by the NSOs of the UK, Ireland and Hungary.

Quality Assurance Framework of the European Statistical System

The *ESS quality assurance framework* (🔗) accompanies and complements the ES CoP. It identifies possible activities, methods and tools that provide guidance and evidence for the implementation of the ES CoP.

European Central Bank - Statistics Quality Framework

The *European Central Bank Statistics Quality Framework* (ECB SQF) was developed in 2008. It is compatible with the ES CoP. It sets out the main quality principles and elements guiding the production of ECB statistics. It is a statement of intent, not a standard. However, most elements are fully reflected in current practices.

The quality assurance procedures included in the ECB SQF cover programming activities and development of new statistics, confidentiality protection, data collection, compilation and statistical analysis, data accessibility and dissemination policy, monitoring and reporting, and monitoring and reinforcing the satisfaction of key stakeholders.

ESS Handbook for Quality and Metadata Reporting

The latest version of the ESS Handbook for Quality and Metadata Reports (EHQMR) was disseminated in 2020. It superseded the ESS Handbook for Quality Reports, 2014 and the Single Integrated Metadata Structure and its Technical Manual, 2014 (🔗).

The EHQMR is based on the Single Integrated Metadata Structure (SIMS) v 2.0, which provides definitions and reporting guidelines for all ESS quality and reference metadata concepts. SIMS includes a two-component reporting structure:

- the Euro-SDMX Metadata Structure (ESMS) for user reports; and
- the ESS Standard for Quality Reports Structure (ESQRS) for quality reports.

SIMS streamlines and harmonises metadata and quality reporting in the ESS. It minimises the reporting burden on NSOs by facilitating **once for all purposes** reporting, whereby the concepts covered in both quality and user reports are reported upon only once. It facilitates storage of all reports in a single database.

The EHQMR incorporates the *ESS Quality and Performance Indicators* (🔗). These indicators are accompanied by guidelines which, for each indicator, give the definition, applicability, calculation formulae, target value, aggregation levels, interpretation, and references.

Other ESS Quality Management Tools

The *ESS Quality Glossary* (🔗), first published in 2003, covers many technical terms in ESS quality documentation, providing a short definition of each term and indicating the source of the definition. It was transferred to the Concepts and Definitions Database (CODED), where it is now available as a theme. Other glossaries containing quality-related terms are also available as themes in CODED, namely the *SDMX Glossary Version 1.0 (2016)* (🔗) and *General Statistical Terminology* (🔗).

The *Quality Guidelines for Multi-source Statistics* (🔗) provide practical support for the design and implementation of multisource statistics within a comprehensive quality framework. For each ES CoP output quality dimension, the guidelines are developed around three objectives:

- error prevention;
- monitoring/correction/adjustment of possible errors during the statistical production process; and
- assessment of the impact of the errors on the final estimates.

The Handbook on Data Quality - Assessment Methods and Tools (🔗) details the full range of methods for assessing process and output quality and the tools that support them. *The Handbook on improving quality by analysis of process variables* (🔗) describes a general approach and useful tools for identifying, measuring and analysing key variables associated with a statistical process. *The European Self-Assessment Checklist for Survey Managers* (DESAP) enables the conduct of quick but systematic and comprehensive quality assessments of a statistical process (survey, census or administrative process) and its outputs and identification of potential improvements. The documents are also available in electronic form: *Electronic DESAP-E checklist* (🔗) and *Electronic DESAP user guide* (🔗) and an abbreviated version is available as DESAP condensed (🔗).

8.3.3 Other internationally developed quality assurance frameworks

International Monetary Fund - Data Quality Assessment Framework

The International Monetary Fund (IMF) first developed its *Data Quality Assessment Framework* (DQAF) in 2001. Its aim is to complement the quality dimensions of the IMF Special Data Dissemination Standard (SDDS) and the Enhanced General Data Dissemination System (eGDDS) and to underpin the assessment of the quality of the data provided by countries as background for IMF Reports on the Observance of Standards and Codes (ROSC). The SDDS, its new version (SDDS Plus), and the eGDDS provide guidance to member countries on the provision and relevance of their economic and financial statistics.

> The DQAF is designed for use by IMF staff and NSOs in assessing the quality of specific types of national datasets.

It covers the national accounts, the consumer price index, the producer price index, government financial statistics, monetary statistics, the balance of payments and external debt. It has been very widely used by the IMF and by the NSOs with which the IMF has been involved in ROSC activities. It has also influenced quality assurance framework developments in other countries such as Italy, Netherlands and Finland.

It is a process-oriented quality assessment tool. It provides a structure for comparing existing practices against best practices using five dimensions of data quality: **integrity, methodological soundness, accuracy and reliability, service-ability and accessibility,** in addition to the so-called **prerequisites for data qualit**y. It identifies three to five elements of good practice for each dimension and several indicators for each element. Furthermore, in the form of a multilevel framework, it enables datasets to be assessed concretely and in detail through focal issues and key points. The first three levels of the framework (dimensions, elements and indicators) are generic, that is, applicable to all datasets, the lower levels are specific to each type of dataset.

The DQAF dimensions, elements and indicators are rather different from the quality dimensions and indicators in the UN NQAF and the ES CoP. Although mappings between the DQAF, ES CoP and UN NQAF dimensions and indicators have been prepared, an NSO cannot readily design a quality assurance framework incorporating both. In essence, it has to make a choice between a UN NQAF/ES CoP approach and a DQAF approach.

African Charter on Statistics

The African Charter on Statistics (🔗) was adopted in 2009 and entered into force in 2015. It presents six quality principles expressed in the form of 25 quality statements covering most of the quality principles in the ES CoP but reorganized and tailored to the African situation. The principles are:

- **Professional independence** – comprising scientific independence, impartiality, responsibility and transparency;

- **Quality** – comprising relevance, sustainability, data sources, accuracy and reliability, continuity, coherence and comparability, timeliness, topicality, African specificities, and awareness building;

- **Mandate for data collection and resources** – comprising mandate, resource adequacy and cost-effectiveness;

- **Dissemination** – comprising accessibility, dialogue with users, clarity and understanding, simultaneity, and correction;

- **Protection of individual data, information sources and respondents** – comprising confidentiality, giving assurances to data providers, use for statistical purposes, and rationality; and

- **Coordination and cooperation** – comprising coordination and cooperation.

ECLAC – Code of Good Practice in Statistics

The *Code of Good Practice in Statistics for Latin America and the Caribbean* (🔗) was developed with support from the Economic Commission for Latin America and the Caribbean (ECLAC) and Eurostat by a working group of ECLAC countries in 2011. It was modelled on the European Statistical Code of Practice (2008) and extended to include coordination of the NSS as a whole (as subsequently incorporated in the 2017 ES CoP).

Caribbean Community – Statistics Code of Practice

The Caribbean Community (CARICOM) developed its Statistics Code of Practice (🔗) with support from the European Union. It is based on the ES CoP and has 15 principles and 78 indicators.

ASEAN Community Statistical System Code of Practice

ASEAN Community Statistical System (ACSS) adopted its Code of Practice (🔗) in September 2012. It is modelled on the ES CoP (2008) but with fewer principles and indicators.

UNECE Quality Indicators for the Generic Statistical Business Process Model

As detailed in *Chapter 15.4.3 — Generic Statistical Business Process Model (GSBPM)*, the Generic Statistical Business Process Model (GSBPM v5.1) provides the standard template for describing surveys and administrative data collections in terms of 8 phases and 44 subprocesses. Quality Indicators for the GSBPM Version 2.0 - For Statistics derived from Surveys and Administrative Data Sources (🔗) provides a set of indicators to monitor the quality of the production processes for each phase.

United Nations Statistical Quality Assurance Framework

At its first meeting, the Committee for the chief statisticians of the United Nations System (CCS-UNS) decided that a generic quality assurance framework would be developed for use by United Nations agencies in managing their statistical

data. Several UN agencies already had a quality framework or a code of practice of some sort and, while these differed from one another, there was a high degree of overlap.

The resulting *United Nations Statistical Quality Assurance Framework* (UN SQAF) was developed by a UN Task Team and adopted by the CCS-UNS in March 2018. It is based on a broad concept of quality that incorporates institutional, process and output dimensions. It is not prescriptive. It provides a template and guidelines that can be adapted by a UN agency to suit its circumstances. It is expected that UN agencies without a quality framework will adapt this generic version to the situation of their agency.

Whilst the UN SQAF is designed for international statistical organizations, the ideas it incorporates are also informative for NSOs.

8.4 National quality assurance frameworks, guidelines, and tools

Several NSOs have developed and implemented their own quality assurance frameworks more or less from scratch. The benefit of starting with a clean sheet is the feeling of ownership. Others have taken advantage of the UN NQAF, the ES CoP, or the quality assurance frameworks of NSOs. This section outlines some national quality assurance frameworks, guidelines and tools that are well established and readily available on the Internet.

8.4.1 Statistics Canada's Quality Assurance Framework and Quality Guidelines

Statistics Canada's Quality Assurance Framework (🔗) was one of the first such frameworks introduced (2002). The most recent version (2017) serves as the highest-level governance tool for quality management at Statistics Canada. It gives an overview of the quality management and risk mitigation strategies used by the organization's program areas. It is used in conjunction with the organization's management practices, as described in its Quality Guidelines.

Statistics Canada's Quality Assurance Guidelines (🔗) (first published 1985, most recent version 2009) bring together guidelines and checklists on the many issues that need to be considered in the pursuit of quality objectives. The focus is on how to assure quality through effective and appropriate design or redesign of a statistical project or program from inception through to data evaluation, dissemination and documentation. The guidelines are useful to staff engaged in the planning and design of surveys and other statistical projects, as well as to those who evaluate and analyse the outputs of these projects.

Statistics Canada also publishes a *Compendium of Management Practices for Statistical Organizations from Statistics Canada's International Statistical Fellowship Program* (🔗). Chapter 7.5 focuses on quality management and is an excellent source of advice for developing NSOs.

8.4.2 Statistics Finland Quality Guidelines

Statistics Finland's *Quality Guidelines for Official Statistics (2nd edition, 2007)* (🔗) is intended for all who are interested in the functioning of statistical systems, as well as for the users and producers of statistics. As suggested by its title, it presents quality guidelines. In addition, it outlines the framework within which the field of statistics operates in Finland and describes the relevant legislation, as well as current best methods and recommendations. The aim of the document is to improve the usability of the skills and competence required in the designing and implementing of statistical systems by gathering the existing principles into common knowledge capital.

8.4.3 Australian Bureau of Statistics Data Quality Framework

The *ABS Data Quality Framework* (ABS DQF) provides the standards for assessing and reporting on the quality of statistical information. It is designed for use by a range of data users and providers in different settings, including government agencies, NSOs and independent research agencies. It improves a user's ability to determine whether a statistical product is fit for purpose and to interpret data. It can also assist in the development of statistical processes.

The ABS DQF is based on Statistics Canada's quality assurance framework and the ES CoP. It defines seven dimensions of quality, namely: institutional environment, relevance, timeliness, accuracy, coherence, interpretability and accessibility.

8.4.4 UK Office for National Statistics Quality Management Strategy and Framework

The *ONS Quality Management Strategy (last revised 2015)* (🔗) sets out the organizational commitment and approach to quality and quality goals. It helps to ensure that ONS meets its obligations under the UK Code of Practice for Official Statistics. It commits the organization to further develop a culture of quality to ensure that it:

- produces statistical outputs that meet user needs for quality;

- explains the quality of outputs to users by providing up to date metadata;

- improves the quality of outputs and processes through standardisation, continuous improvement and quality reviews.

The *ONS Statistical Quality Framework* (🔗) supports the Quality Management Strategy by setting out the initiatives and activities that support, improve and assure the quality of outputs. It describes the day-to-day activities that are in place at an organizational level for:

- **quality assurance** - anticipating and avoiding problems by walkthroughs of statistical outputs, providing guidance and training in quality assurance practices;

- **quality control** - responding to observed problems, using policies for describing how corrections and revisions are handled;

- **quality improvement** – undertaking improvements identified during methodological and quality reviews on a rotating basis; and

- **quality reporting** - informing users of the quality of our outputs.

8.4.5 South African Statistical Quality Assurance Framework

Statistics South Africa first developed its *South African Statistical Quality Assurance Framework* (SASQAF) in 2008 and revised it in 2010. It serves as a toolkit for the certification of statistical products as official, and the maintenance of the quality of the statistical products. It is primarily geared towards serving the needs of data producers and data assessors. However, it may be a useful tool for any agency concerned with data quality. Its formulation allows for easy integration with other national and international quality reporting tools.

It presents background information on the quality of statistics and the certification process applicable in South Africa. The eight quality dimensions are defined (nine including Prerequisites for Quality). They are based on the IMF's DQAF quality dimensions and the ES CoP output principles. Each quality dimension is supported by quality indicators, each of which is broken down into standards that need to be implemented to ensure conformance with the indicator. Associated with each standard is an assessment level expressed in the form of four mutually exclusive categories. Guidelines to meet standards are provided for each dimension.

8.4.6 Italian National Institute of Statistics Quality Guidelines

In 2012 Istat introduced its *Quality Guidelines for Statistical Processes* (⚲), which build on the ES CoP, also taking into account the IMF's Data Quality Assessment Framework, especially in relation to economic statistics and the National Accounts. Following the ES CoP output principles, the requirements for statistical outputs are:

- to be relevant with regard to users' information needs;

- to be accurate, that is to provide estimates or indicators that are as reliable as possible;

- to be timely in measuring the phenomena being observed;

- to be easily accessible and supported by metadata allowing for a full understanding of data; and

- to enable comparisons over time or among different sources.

The Guidelines aim at describing the principles to be followed when planning, running and assessing a statistical process, as well as at illustrating quality requirements of statistics. They are in two parts.

- The first part is dedicated to process quality and follows the phases of the statistical production process. For each phase, the principle or target to be achieved is stated, and it is accompanied by summary instructions or guidelines to be followed in order to accomplish it.

- The second part concerns product quality. It describes and explains the quality requirements but does not contain guidelines for measuring quality, which are found in the first part.

The Guidelines are addressed to survey managers responsible for statistical production. They provide benchmarks for assessing process and product quality (as well as the degree of compliance with other European and national standards) using self-assessment and internal statistical audit. In each case, quality assessment is based on ascertaining the degree of compliance of statistical processes and products with the Guidelines' principles and requirements.

8.4.7 Statistical Institute of Jamaica Quality Assurance Framework

The *Quality Assurance Framework of the Statistical Institute of Jamaica* (SQAF) is structured in accordance with the first four sections of the UN NQAF, comprising:

- **Quality context** – the circumstances and key issues driving the need for quality management, benefits and challenges, and relationships to other quality frameworks and code of practice.

- **Quality concepts** – comprising methodological soundness, integrity and eight data quality dimensions.

- **Quality assurance guidelines** – comprising 18 SQAF lines, generally following the UN NQAF lines but without coordination of the NSS or metadata management.

- **Quality assessment and reporting** – as in the UN NQAF.

8.4.8 Palestinian Central Bureau of Statistics Code of Practice

Through the *Code of Practice for Palestine's Official Statistics* (⚲) the Palestinian Central Bureau of Statistics (PCBS) seeks to develop nationwide statistical practices and strengthen confidence in the Palestinian Statistical System. The Code draws on the experiences of statistically developed countries. It touches upon legal framework, the areas covered by official statistics, the importance of utilizing data compiled by PCBS, the importance of the media in statistics, and the role of statistical units in ministries and government agencies in addition to the PCBS.

The Code discusses best practices for statistical work based on the Fundamental Principles of Official Statistics, including the relationship between the PCBS President and the statistical units at ministries and government agencies, the role of the Advisory Council for Official Statistics, and interpretation and implementation of the Code.

In line with the Code, the PCBS:

- applies the European Self-Assessment Checklist for Survey Managers (DESAP);

- received ISO-9001:2008 certification in 2010;

- received a Committed to Excellent certificate from EFQM in 2017; and

- prepared guidelines for a Palestinian NQAF based on the UN NQAF in 2018.

8.4.9 Philippine Statistics Authority Quality Management System

The Philippine Statistics Authority (PSA) *Quality Management System Manual* (QMS), disseminated in 2016, is based on the ISO 9001: Quality Management System - Requirements. It includes:

- PSA profile - mandate, vision, mission, and core values;

- PSA organizational structure and function descriptions (including the description of the Systems Quality Assurance Division);

- QMS scope, coverage and process map;

- Management process descriptions;

- Quality policy;

- Statistical planning, policies and standards development descriptions;

- Risk registry and action plan.

The QMS Manual demonstrates PSA's ability consistently to provide products and services that meet the needs of users and the applicable statutory and regulatory requirements. It identifies the processes needed for the quality management system, their interactions and the criteria and methods required to ensure effective operation and control.

It does not contain the sort of material typically found in a quality assurance framework focused on statistical operations, such as quality concepts, guidelines and evaluation procedures.

8.5 Designing and developing a quality management framework

An NSO has to develop a quality management framework appropriate to its unique situation as defined by the legislation that it enacts, its mission, vision, core values and strategic objectives, demands from users and stakeholders, criticisms regarding lack or relevance or timeliness or publication errors, and so on. However, although these may well vary from one country to another, there is no point in completely re-inventing the wheel in designing an appropriate framework. Rather than start from scratch, it is easier and more effective to select general quality management principles from those described in *Chapter 8.2 — Generic quality management systems and other relevant standards* and a quality assurance framework, guidelines and tools from those described in *Chapter 8.3 — Quality assurance frameworks, guidelines, and tools*, customise them as needed, and use them as the starting point for framework design and development or revision and implementation.

> The starting points for development are the existing quality framework (if any), the regional quality framework, and the UN NQAF Manual.

Of course, the NSO should also take advantage of quality tools, wherever developed. For example, an NSO in an EU Member State will inevitably base its framework on the ES CoP, the ESS Quality Assurance Framework and accompanying tools.

8.5.1 Organizational context

A prerequisite for a quality management framework is an understanding of the organizational context within which the framework will operate.

This includes the NSO vision, mission, core values, and strategic objectives. Assuming that these are aligned with the UN Fundamental Principles of Official Statistics, they are not to be questioned, but rather to be reviewed and understood as the base on which to build the quality management framework.

The next step is to identify the particular reasons for, and objectives of, quality management within the NSO and the benefits that are expected to be derived from it.

Many of these may be shared with other NSOs; some may be unique to the organization.

Published errors that caused embarrassment and potential damage to the credibility of the organization and its outputs may be a catalyst or large changes in resources may be the impetus for the shift towards managing quality in a more formalized and systematic way. Similarly, government-wide reform initiatives, changes in NSO management, NSO restructuring, or the need to comply with legislation or regulations are examples of other driving forces leading to a decision to embark upon the formulation of a quality assurance framework. Statistics Canada's first quality assurance framework arose from the need to provide evidence to an externally imposed government audit.

As noted in the UN NQAF Manual, the process of developing a quality management framework is typically best carried out by an NSO task force comprising experts from a variety of areas, for example: programme planning; survey design; survey operations; dissemination; infrastructure development and support.

The framework development process has intrinsic benefits of its own since it obliges staff from various disciplines to come together to confront and tackle quality issues, to think through the requirements, to agree upon priorities, and to evaluate the costs and benefits while keeping in mind that not everything can or should be undertaken.

8.5.2 Quality concepts

General quality management principles

Underpinning a quality management framework is a set of general quality management principles.

Regarding a choice of such principles, there seems to be every reason to adopt one of the formulations associated with the generic quality management systems summarised in *Chapter 8.2 — Generic quality management systems and other relevant standards*. The ISO 9000 general quality management principles are probably the most common choice. However, an NSO in a European country may well opt for those associated with the EFQM Excellence Model, especially if that is the preferred option for other government agencies in the country.

Of course, an NSO can mix and match principles from two or more generic systems, or it can invent its own from scratch. There seems little point in doing this. Each of the various generic systems has been carefully thought through and is supported by implementation guidelines and a body of experience.

The major decision is whether to build general quality management principles into the quality assurance framework or to introduce a separate generic quality management system into the NSO. In essence, the answer depends upon whether the organization wants to seek quality certification. For example, it may be a government prerogative that all government agencies in the country seek quality certification.

- If the organization decides to seek certification, then it is imperative to have a quality management system based on standards that provides certification. It can be selected from amongst the options presented in *Chapter 8.2 — Generic quality management systems and other relevant standards*.

- If the organization decides that certification is not necessary, then it is preferable to design a quality assurance framework that includes general quality management principles rather than to have a separate quality management system.

Defining/adopting statistical quality principles and associated indicators

At the core of a quality management framework is the definition of quality and a set of statistical principles and corresponding elements/indicators.

Whilst an NSO may choose its own particular definition and set of principles, again, there is no great virtue in reinventing the wheel. The sets of principles outlined in *Chapter 8.3 — Quality assurance frameworks, guidelines, and tools* are a good starting point. In the absence of any particular reason to the contrary, there is a lot to be said for defining the quality principles in accordance with the principles in UN NQAF, or the ES CoP or other regional framework. These frameworks have very similar coverage.

If alignment with the IMF DQAF is important for an organization, then the DQAF can be used as it stands, or in a hybrid form with the ES CoP as, for example, in the case of Statistics South Africa's SASQAF, summarised in *Chapter 8.4.5 — South African Statistical Quality Assurance Framework*.

8.5.3 Instilling a quality culture

As noted in the UN NQAF Manual, quality assurance activities – monitoring, documenting, standardizing and reporting in particular – are time-consuming and labour intensive, with payoffs that are not immediately obvious.

Thus, staff reluctance to accept an increase in their workload associated with the introduction of a quality framework and no corresponding increase in resources to carry out their "regular" responsibilities has to be overcome. Furthermore, quality work has to be reviewed, maintained and enhanced over time, which requires a long-term commitment, not only from management and the quality team but from the staff at all levels. To obtain this commitment, the promotion and communication of the quality management features, benefits and requirements are necessary. This can be accomplished through sharing of information and training, both of which should be tailored to the various levels of staff. The NSO must publicise quality principles, explain how they are to be implemented and what the impacts are likely to be. Quality must become a core value, embedded in the culture of the organization.

The main tool is quality training. Development and implementation of a quality training programme is essential. It may well be in two parts.

- The first part focuses on general quality management principles and their application in the organization. Such training can readily be purchased from a reputable management consulting company. It is likely to be one of their standard offerings. Provided the company is supplied with appropriate documentation about the NSO, it will most likely be prepared to illustrate the application of the principles with concrete examples from the NSO itself.

- The second part focuses on statistical aspects of the quality management framework – the statistical quality assurance framework – incorporating the definition of quality, the statistical quality principles and the quality tools to support their implementation. Such training is specialised to NSOs and thus has to be developed in house or borrowed from another NSO or international statistical organization.

8.5.4 Developing guidelines on statistical quality

Quality guidelines are a vital aspect of a quality management framework. They provide quality-related practices and reference material that support the application of the statistical quality principles. The starting point for developing quality guidelines for an organization are the sets of quality principles, indicators/elements and guidelines that have already been developed. These include:

- The quality principles, requirements and elements in the *UN NQAF Manual*

- The quality principles, indicators and methods in the *ESS Quality Assurance Framework* (🔗), which accompanies the ES CoP

- The dimensions, elements and indicators in the *IMF's Data Quality Assessment Framework* (DQAF)

- The various country QAFs summarised in *Chapter 8.3 — Quality assurance frameworks, guidelines, and tools*, and available from the corresponding websites

In all cases, the guidelines must be tailored to the specific situation of the organization as they need to take into account the legislation, statistical infrastructure, skills and resources that are particular to the organization and the country in which it operates.

Quality guidelines may be **principle oriented, or process-oriented**, or a mixture, as further discussed in the following subsections.

Quality principle-oriented guidelines

Quality principle-oriented guidelines are organized around the quality principles. They provide advice, tools and reference documents for each of the indicators/elements associated with the principles. The ESS Quality Assurance Framework and the UN NQAF are examples.

> The virtue of a principle-orientation is that the guidelines can be very readily converted into a quality checklist (as further described below) that is aligned with the output quality principles that are the basis for a user quality report.

The disadvantage relative to process-oriented guidelines is that they are not so readily applicable to process design, development, production and evaluation.

Process-oriented guidelines

Process-oriented guidelines are organized around the phases of a generic statistical process, preferably as defined by the Generic Statistical Business Process Model (GSBPM v5.1). As statistical infrastructure and cross-cutting activities such as programme design, classification management and metadata management are not effectively covered by the GSBPM, the set of process phases has to be supplemented by groups of activities such as professional independence, transparency, coordination of the NSS, management of statistical standards and metadata management to provide a complete set of headings for the guidelines.

> The advantage of process-oriented guidelines is that they can be readily applied during process design, execution and evaluation. The disadvantage is that they do not so readily lead to quality evaluation from a user perspective as they do not align with the output quality principles.

Mixture of quality principle and process-oriented guidelines

Istat's Quality Guidelines for Statistical Processes (🔗) are an example of a mixture of quality principle and process-oriented guidelines. As noted in *Chapter 8.3 — Quality assurance frameworks, guidelines, and tools*, they are in two parts.

- The first part is dedicated to process quality and follows the phases of the statistical production process.

- The second part concerns output quality, with some output quality measures actually coming from the first part.

8.5.5 Quality monitoring and evaluation overview

It is important to have an overall strategy for quality monitoring and evaluation of statistical processes and their outputs to ensure that all aspects are covered. Note that in this context, **quality evaluation, quality review and quality assessment** are regarded as synonyms and for brevity are referred to simply as **evaluation**, as this is the term used in the GSBPM.

Evaluation is undertaken after a statistical process has been completed, in contrast to monitoring which is undertaken as the process takes place. Evaluation is much more in-depth than monitoring. It typically covers several cycles of a monthly or quarterly process, whereas monitoring takes place during the course of each cycle.

Six types of quality monitoring and evaluation of a process may be distinguished. They are:

1. monitoring of quality and performance indicators during each cycle of the process;

2. application of quality gates during each cycle of the process;

3. self-evaluation of the process, typically annually;

4. internal, peer-based evaluation of the process on a rotating or as-needed basis;

5. external evaluation of the process, on an as-needed basis;

6. labelling of process outputs as official statistics, once only, or with periodic renewal.

Figure 9 indicates how these types relate to one another and to the development, conduct and enhancement of a statistical process.
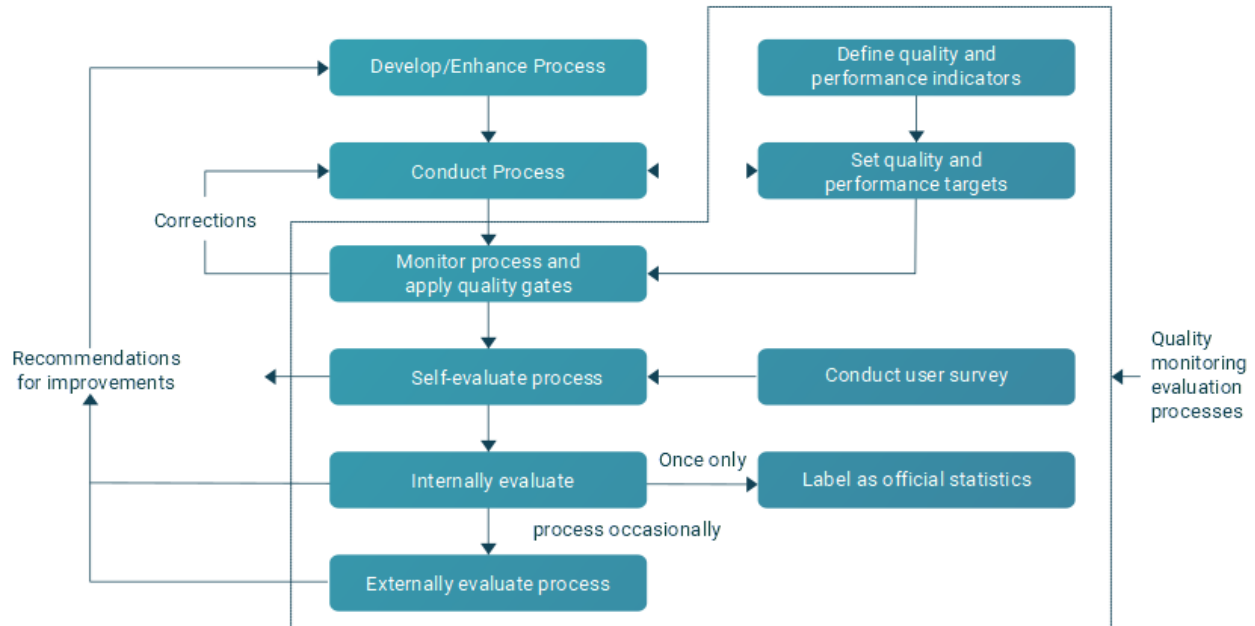

Fig. 8.2: Relationships of monitoring, evaluation and labelling

A slightly different perspective is presented in Figure 10, which shows Eurostat's approach to quality assurance. Monitoring and evaluation are represented by three layers. Layer 1 is at the level of the process manager. On the way from Layer 1 to Layer 3, information about process quality is increasingly summarised, making it more appropriate for senior managers and users.

In developing countries, resources may limit the scope of monitoring and evaluation of the elements in Layer 1.

8.5.6 Monitoring quality and applying quality gates

Quality and performance indicators

> The objectives of identifying and monitoring quality and performance indicators (sometimes referred to as **key performance indicators**) are to check ongoing operations as they take place in order to:

- monitor quality (i.e., effectiveness) with respect to target objectives, identify sources of operational errors and correct them; and

- monitor performance (i.e., efficiency) with respect to target objectives, identify sources of operational blockages and correct them.

Quality and performance indicators may relate to the statistical process or to its outputs. They should be very carefully chosen as their main purpose is to monitor the process in real-time. Too few quality and performance indicators, or the absence of quality and performance indicators covering key aspects of the process, results in ineffective monitoring. Too many quality and performance indicators, or ill-chosen ones, burden the process and waste resources.

The procedures involved in the development and use of quality and performance indicators are to:
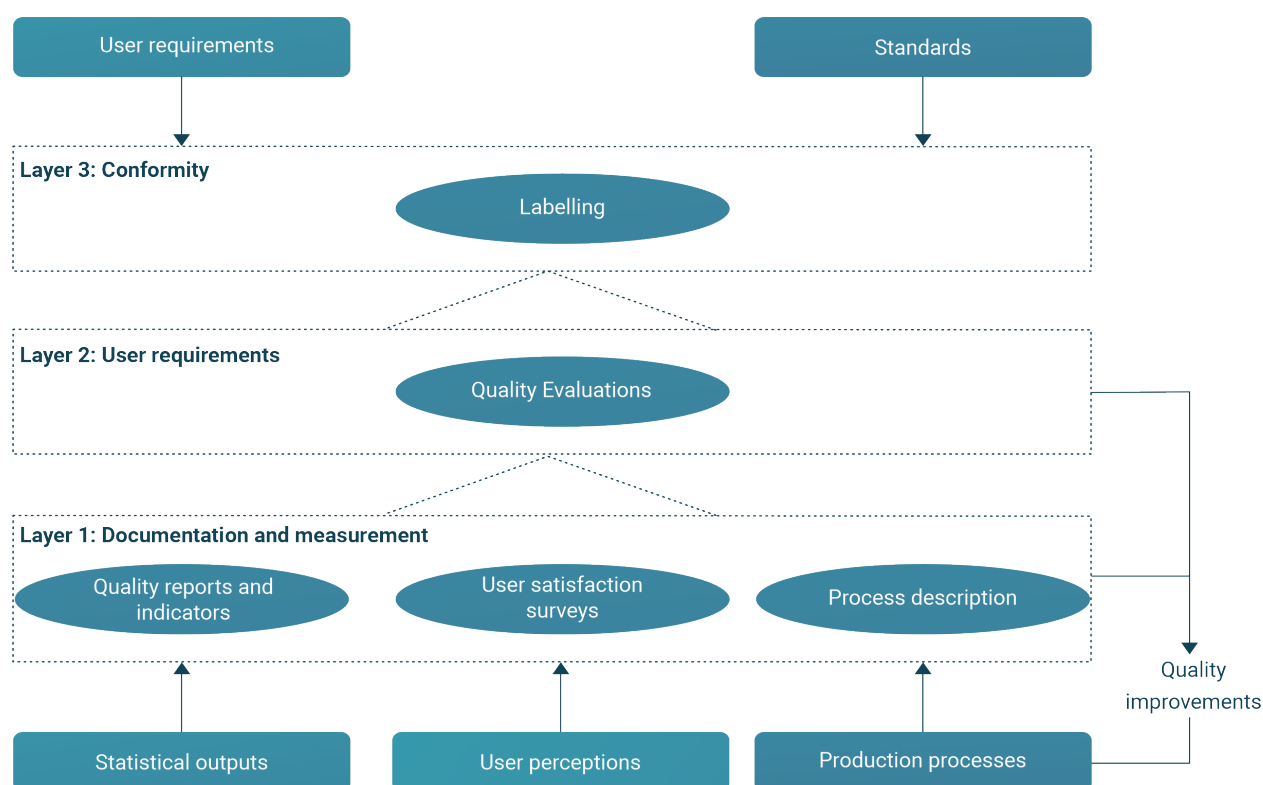
Fig. 8.3: ESS monitoring, evaluation and labelling

- define a suitable set of indicators based on a generic list;

- designate selected indicators as being key and set targets for each of these;

- monitor the values of quality and performance indicators and act on operational problems;

- analyse the values of key quality and performance indicators on a regular basis and compare the values with targets;

- take action to address operational problems thereby identified; and

- document structural problems, i.e., problems that cannot be solved at the operational level, and provide them as input to the next quality evaluation.

Examples of generic **quality indicators** are i) response rates by stratum; ii) sampling errors by stratum; iii) error rates during data capture and primary editing; iv) number of outliers detected during secondary editing/analysis; and v) the number of days after the reference period that data are published.

Examples of generic **performance indicators** are the average time required by a respondent to complete a questionnaire; the number of unsuccessful follow-up attempts, and the number of staff days required to complete editing.

The ESS maintains a standard set of Quality and Performance Indicators (🔗).

Quality Indicators for the GSBPM Version 2.0 (🔗) provides indicators to monitor the quality of the production processes for each phase.

Quality gates

The objectives of quality gates are to ensure significant errors are detected as soon as possible after they have occurred, for the underlying causes to be determined, for the errors to be corrected, and (in the case of a repeating process) for the process to be adjusted to prevent or reduce similar errors in the next cycle. They are, in essence, quality control.

Quality gates are placed at key points in the process. To identify appropriate key points, it is necessary to consider what can go wrong, when it can occur, what impact it can have, and how it can be detected. To facilitate detection, quality gates are typically placed at natural beginnings or endings of sub-processes within a process. For example, after sample selection, but before data collection. This is essentially risk management.

Problems uncovered by quality gates are addressed at the time that they are discovered. The action taken can vary from **stopping the process entirely** until the underlying problem is fixed to **delaying the process, to proceeding with caution**.

Examples of quality gates for a statistical production process are:

- data collection does not commence until the sample has been verified;

- data collection is not closed off until an acceptable response rate has been obtained;

- statistical tables and commentary are not released until they are verified and signed-off by the head or a deputy head of the organization.

Quality dashboard for senior management

The aim of a dashboard is to provide senior management with a monthly/quarterly review of ongoing statistical operations, thereby enabling:

- overall monitoring of quality and performance with respect to target objectives;

- identification of areas of generally poor quality or performance.

This encourages and facilitates decisions regarding short-term changes that are needed.

8.6 Evaluation of a statistical process and its outputs

Evaluation of a process and its outputs may be of several types, each of increasing complexity, with increasing demands on resources, as indicated in Figure 6 and described in the paragraphs below. However, **all types of evaluation should result in a quality report** detailing the findings, identifying quality and performance problems and making recommendations to senior management for quality and performance improvements that cannot be undertaken with the resources currently available to the process.

Abbreviated versions of evaluation reports may be made available to users. The *ESS Handbook on Quality and Metadata Reporting* (described in *Chapter 8.3.2 — European Statistical System – quality management standards, guidelines and tools*) indicates the quality and metadata that should be disseminated to users and outlines how they should be described.

8.6.1 Self-evaluation

> The objectives of self-evaluation are to help the manager and staff responsible for the process to assess its quality and the quality of its outputs, to identify structural weaknesses, and to propose quality improvements.

Self-evaluation is undertaken by the process manager and persons involved in the design and implementation of the process. Depending upon the process and the resources available, it may be conducted annually or biennially. It typically starts with the completion of a standard evaluation checklist that is cross-referenced to the quality principles and guidelines. During completion of the questionnaire, areas of concern that arise are further probed. A set of **improvement action items** is a primary output. These are typically divided into two groups: those that can be implemented immediately without additional resources; and those that require allocation of additional resources and that will be referred to senior management.

Supported self-evaluation is a form of self-evaluation in which a quality expert sits in on the self-evaluation process and helps guide it. This is the recommended approach for a first-time self-evaluation.

8.6.2 Internal peer-based evaluation

Experience has shown that self-evaluation has its limitations. Those responsible for a process may be too close to see some of its deficiencies or possibilities for improvement. This is the reason for a peer-based or external evaluation.

The objectives of the peer-based evaluation are similar to those for self-evaluation but with the understanding that the evaluation is more penetrating, and the target audience includes senior management.

> The procedures are also similar to self-evaluation but with the important distinction that the evaluation team contains members of staff having no connection to the process, the so-called peers, one of whom typically manages the evaluation.

The team is supported by the process manager and other experts involved in its design and implementation.

8.6.3 External evaluation

External evaluation initiated by the NSO

The need to conduct periodic external evaluations of processes and their outputs may be built into an organization's quality framework. Another trigger for external evaluation is significant criticism of its outputs by users or other stakeholders. In organizations that are receiving support from donors or partners, the need to evaluate the efficacy of a donor or partner intervention is also a common trigger.

The target of an external evaluation may be the process or a particular part of the process. The evaluation objectives are to provide the senior management and process manager with an objective view of the quality of the process or some part of it, and hence to identify structural weaknesses and to propose quality improvements for addressing them.

> The procedures are similar to internal peer-based evaluation but with the important distinction that the evaluation team is largely or entirely from outside the organization.

The team is provided with information by the process manager and other experts involved in its design and implementation.

Given that there may be a need to identify and make use of evaluators from outside the organization, it is useful to establish relationships with other NSOs in the NSS and in other countries with the aim of exchanging evaluation services.

External evaluation initiated by a regional organization

> An external evaluation may also arise in the context of a regional programme to check compliance with a regional quality standard, in which context it is often referred to as a **peer review**.

For example, external evaluations, termed peer reviews, form part of the *European Statistical System (ESS) strategy to monitor implementation of the ESCoP in the EU and EFTA Member States* (🔗), administered by Eurostat. The object of each review is to evaluate the compliance/alignment with the ESCoP in the Member State and to help the NSO and other producers of statistics comprising the NSS to further improve compliance. A first-round of peer reviews was carried out in 2006-2008 and a second-round 2013-2015. The third round of peer reviews is being prepared and will take place in 2021-2023. More details are provided in *Peer reviews in the European Statistical System* (🔗).

This type of peer review programme has been adopted by African countries, as described in *Peer reviews of national statistical institutes and national statistical systems in African countries* (🔗). The reviews are centred on compliance with the African Charter on Statistics, adopted in 2009, which provides a set of principles and standards for the functioning of African statistical systems.

8.6.4 User surveys and other user feedback

User surveys and other user feedback are not another type of evaluation, rather they are essential inputs to all types of evaluation, especially in relation to the relevance of outputs, and to obtain user perceptions of other aspects of quality.

A **user survey** is a survey that assesses the satisfaction and/or the perceptions of the users. As regards its coverage, the *UNECE's Recommendations for Promoting, Measuring and Communicating the Value of Official Statistics* (⦿) identify six groups of items:

1. **General satisfaction with products**: relevance, accessibility, access preferences and what characteristics of official statistics the user considers the most important.

2. **General satisfaction with user support**: level of current service and improvements to service.

3. **Design, communication and metadata**: general design of the official statistics website design of statistical warehouse, interpretability, navigation and visualization.

4. **Relevance, responsiveness and innovation**: how effectively official statistics inform the public debate on current issues; the importance of official statistics in helping to understand societal developments and use of new technologies, methods and data sources by the NSO.

5. **Awareness of brand and message**: level of trust in official statistics; understanding the mandate of the NSO; perceived presence or absence of political interference and overall satisfaction with the organization.

6. **Satisfaction with specific products and services**: knowledge, use and quality of a particular product and use of anonymized microdata.

Users are divided into groups according to their needs, as discussed in *Chapter 7 - Users and their Needs*. A user survey can be targeted to one or several groups, as appropriate.

A user survey can take different forms, for example, using mail-out – mail-back questionnaires, personal interviews or web-based surveys. The choice depends on the nature of the information being sought, and on the resources available.

The ISO 10004:2018 Quality management – Customer satisfaction (⦿) standard provides further ideas, and the UNECE's Recommendation cited above include a generic user survey.

Other sources of user feedback include sector committees set up by the organization and comprising experts in the various subject matter areas, and focus groups convened to address particular issues.

8.6.5 Labelling

The labelling of a statistical output follows from and depends upon a favourable evaluation. It is intended to convey a general message to users about its quality. This is important in a world of multiple suppliers. It is a means of distinguishing official statistics from other sources (see also *Chapter 3.5 — Certification and branding of official statistics*). It enhances the visibility and credibility of the output. The label may be brief, for example, **official statistics, or experimental statistics**. It should always be accompanied by an explanation of its meaning.

A label can also be given to an NSO as a whole, reflecting its capacity to produce high-quality statistics, as demonstrated, for example, by certification in terms of a generic quality management systems standard.

8.7 Quality evaluation and certification of NSOs

8.7.1 Quality Evaluation

Quality evaluation may be conducted for organizations as a whole, not just individual statistical processes and their outputs.

Typically, such an evaluation is conducted with reference to a code of practice or similar standard. A good example is the programme of *Peer reviews in the European statistical System* (🔗) with the immediate aim of determining the degree of compliance to the ES CoP and the ultimate objective of enhancing the integrity, independence and accountability of the NSOs that make up the ESS. A first round of peer reviews was carried out in 2006-2008; a second round was launched in 2013 and completed in 2016.

8.7.2 Certification

Quality certification applies to an NSO as a whole and refers to conformance with an internationally recognised standard or other formal criteria, typically a generic quality management system, such as the ISO:9001, or the EFQM Excellence Model, or Lean Six Sigma. It is awarded by an independent external body that specialises in certification.

As previously noted, the decision of whether or not to seek quality certification depends upon the particular circumstances of the organization. It may want the discipline of seeking certification primarily as a means of inducing a culture of quality. It may be expected to seek certification as part of a government-wide quality initiative.

Due to the general nature of the quality management standard on which certification is based, it is almost certain that the activities, tools and document associated with certification will not, by themselves meet the detailed needs associated with quality assurance at the statistical process level. Thus, an accompanying and complementary quality assurance framework is necessary.

8.8 Relationships with other organizational policies, strategies, and frameworks

As noted in the UN NQAF Manual, a quality management framework is one of several policies, strategies, and frameworks that are likely to be in place in an NSO. These other mechanisms are likely to have a much less direct but still significant effect on quality management. In any case, for effective planning and functioning of the organization as a whole, all such mechanisms should be harmonised. A quality management framework is most effective when it has been built into the organizational structure in such a way that quality practices and procedures are integral parts of other mechanisms.

Thus, the formulation of a quality management framework requires an in-depth and thorough review of these other mechanisms. The following paragraphs outline some of the mechanisms that should be considered.

8.8.1 Top management meetings

Every NSO is likely to have weekly or fortnightly meetings of top management at which key decisions regarding ongoing operations are made. It is important that quality management has a voice at such meetings. This can be achieved by ensuring that one member of the top management is the "quality champion" and/or that there is a quality committee that can expect access to the meetings on a regular, say quarterly, basis to review the quality dashboard and any significant quality problems and proposals for improvement, and that can obtain immediate access to the next meeting in the event of a major quality issue that must be addressed immediately.

8.8.2 Multi-annual planning process

Every NSO is likely to conduct periodic discussions of the multi-annual plan, covering the extent of its achievements, and its extension to future years. It is important that quality management is included herein, to ensure that consideration is given to quality improvements that have been identified and need an injection of resources. Further, resources should be set aside to support the quality team in promoting a culture of quality and in developing quality tools.

This can also be achieved by ensuring that one member of the top management is the "quality champion" and/or that there is a quality committee that can expect access to the multi-annual discussions.

8.8.3 Performance management/audit

Performance management typically includes quality goals. Quality management typically includes performance management goals. Thus, it is vital to ensure that, if a performance management/audit programme exists, it should be coordinated with the quality management framework to avoid any inconsistency in messages or overlap in activities.

For example, program management can take advantage of the outputs of quality monitoring and evaluation. Conversely, evaluation of statistical process quality may be conducted jointly with performance management. For example, in 2006, Statistics Canada commenced evaluation of statistical processes, on average about five processes per year. The activity contributed to a growing awareness of quality assurance and a shift in attitude from fear of exposing weaknesses to a more constructive view of risk identification and mitigation. By 2014, the organization had reached a point where it did not need such a labour-intensive mechanism. Thus, it discontinued the evaluation process on the grounds that the measurement of program performance and delivery gave sufficient oversight into quality.

8.8.4 Risk management

Risk is defined as the **effect of uncertainty**, where an **effect** is a deviation from what is expected, whether positive or negative, and **uncertainty** is the state of deficiency of information related to the likelihood or consequences of an event. Risk is often expressed as a combination of the consequences of an event and the associated likelihood of occurrence.

Risk management is the identification, evaluation, and prioritization of risks accompanied by coordinated and economical application of resources to minimize, monitor, and control the probability or impact of events with negative consequences. Many NSOs have a risk management framework. While it traditionally focuses on financial management, security and safety, risk management can be applied to statistical production. Quality gates are a particular example.

As noted in *Chapter 8.2.4 — ISO 31000:2018 Risk Management*, risk management and quality management are closely related. Quality practices are easier to understand and their value easier to recognise when they are framed in terms of the risks they mitigate. Quality indicators can be inverted to become risks. Quality management and risk management are both more likely to succeed when they are coordinated and jointly incorporated in day-to-day activities. They should not be independently developed and actioned.

8.8.5 Metadata management

> Quality and performance indicators are metadata. Quality evaluation depends on metadata. Quality reports are metadata.

Thus, quality management and metadata management are closely related and should be harmonised. Quality related metadata should be maintained in accordance with organizational metadata management policies and make use of organizational metadata management tools. Conversely, metadata management facilities should address quality management needs, for example, for storage of, and ready access to quality and performance indicators and quality reports.

For example, Eurostat published the 2020 version of the *ESS Handbook for Quality and Metadata Reports* (EHQMR). It combines and supersedes the *ESS Handbook for Quality Reports, 2014* and the *Single Integrated Metadata Structure and*

its Technical Manual, 2014 (🔗), as was discussed in *Chapter 8.3.2 — European Statistical System – quality management standards, guidelines and tools*.

As stated in the *UN NQAF Manual*, metadata management can be facilitated and guided by the use of standard models such as the GSBPM and the Generic Statistical Information Model (GSIM) The GSIM is a reference framework of internationally agreed definitions, attributes and relationships that describe the information objects used in the production of official statistics. It covers all the information objects used in phases of a statistical process and is consistent with Common Metadata Framework, Part A (🔗), which identifies 16 core principles of statistical metadata management applying the design and implementation of a statistical metadata system. Further details of metadata management are provided in *Chapter 14.3 — Managing statistical data and metadata*.

8.8.6 Human resource management

Quality management needs should be considered in human resource management, in particular, the needs for recruitment and training of staff for a quality unit, the training of methodology and survey staff in the use of quality guidelines and tools, and the training of all staff in quality management principles.

8.9 Implementing a quality management framework

8.9.1 Appoint a quality management team and manager

In an organization with a quality culture, quality is everyone's responsibility. However, in order to sustain the culture and to provide the tools to support it, there is a need for a dedicated quality management team. The functions of the team include:

- continually promoting a culture of quality, keeping everyone, senior managers and statisticians alike, on their toes;
- developing, promoting and supporting the implementation of the QF;
- providing incentives to follow quality guidelines and monitoring their use;
- organizing and administering quality training;
- developing or obtaining quality tools and making them readily available;
- checking that quality gates are working as they should;
- ensuring ongoing quality evaluation on a rotating and as-needed basis;
- investigating serious errors in published outputs;
- draw attention to quality gaps and potential quality gaps; and
- following up on proposed quality improvements.

The functions of the quality manager are to lead the team and to liaise with senior management.

In large NSOs, the quality team may be a dedicated quality unit. In smaller organizations, there may be no quality unit per se, and the quality team may comprise one or more staff belonging to a unit with other core functions (often a methodology unit) that has been assigned responsibility for quality. In very small organizations, the team may comprise a single person nominated to handle quality, possibly on a part-time basis.

8.9.2 Identify quality management framework committee/champion

To ensure that senior management is kept fully aware of quality initiatives, responds to quality concerns and dedicates resources to quality improvements, it is vital that the NSO has a high-level **quality committee** or, at the very least, a **quality champion**, amongst the top managers. Without such support from the highest-level decision-making committee in the NSO, quality concerns and initiatives are likely to take second place to more urgent but less important matters.

8.9.3 Establish a quality training programme

Set up a quality training programme for NSO staff as the first step in introducing a quality management framework. The programme should cover general quality principles, statistical quality principles and quality tools.

Subsequently, the programme should be extended to other national producers of statistics.

8.9.4 Establish quality monitoring and evaluation programme

Set up a programme for rotating evaluation of statistical production and infrastructure processes and for review and revision of quality and performance indicators and targets, and quality gates.

8.9.5 Establish NSS coordinating bodies

It is imperative to be prepared to address NSS-wide quality issues. This requires an inter-organizational advisory board (or equivalent), sectoral committees, and other cross-agency bodies to:

- prepare a national strategic plan for the development of statistics;

- monitor survey design and coordinate data collection;

- discuss and address common quality issues;

- approve the adoption of common standards and methods; and

- ensure adherence to regional and international quality principles.

- An example is the Statistical Clearing House (SCH), which was operated by the Australian Bureau of Statistics (ABS) from 1997 to 2017. Its goal was to promote good survey practice and to minimise respondent burden by requiring the clearance of any business survey that was conducted by or on behalf of the Australian Government and that approached more than 50 businesses. It involved assessing methodology and survey materials. In its final years, the SCH was receiving submissions from around 150 surveys per year. It was reducing respondent burden by some 4000 hours per annum as well as improving the quality of the statistics for the surveys reviewed.

- Another example is the Philippine Statistics Authority's Statistical Survey Review and Clearance System (🔗).

8.10 Relevance to other producers of official statistics

In the process of undertaking its coordination role, an NSO should consider how its quality management framework and supporting quality procedures and tools can best be adapted to other producers of official statistics. For example, the NSO may develop and promote a version of its quality guidelines for the entire NSS, especially tailored to organizations producing statistics based on administrative data.

Other producers of official statistics are statistical units located within government organizations that do not have statistics as their core function, for example, the central bank, or the department of education. For an organization of the first type, all the information provided in *Chapter 8 - Quality Management* is relevant with the exception of NSS coordination, which is the responsibility of the NSO. The organization should consider, and draw on, what the NSO uses as a quality

assurance framework, including the application of general quality management principles, statistical principles, quality guidelines, monitoring and evaluation. As part of the NSS, the organization should adopt a similar approach, tailored as needed to its own particular situation, for example, simplified to reflect its smaller size relative to the NSO.