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Session 1: Quality assessment

Matthias Reister, Chief
Development Data Section
Statistics Division, Development Data and Outreach Branch
United Nations Department of Economic and Social Affairs
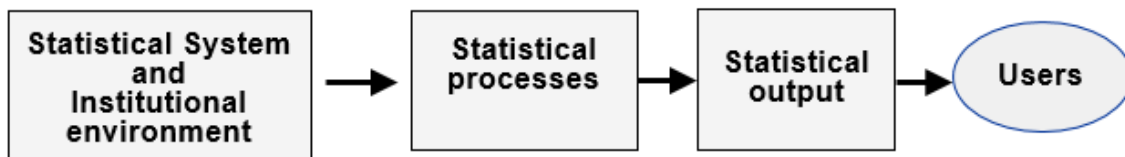

Definition of quality in Statistics

Quality = "Fitness for use"

Degree to which a set of inherent characteristics fulfils requirements

Definition: Statistical quality frameworks

Quality frameworks provide a coherent and holistic system of quality management

Quality management framework of UN NQAF

Statistical quality frameworks
Quality management framework of UN NQAF

[NQAF 1] Coordinating the national statistical system
[NQAF 2] Managing relationships with data users and data providers
[NQAF 3] Managing statistical standards
[NQAF 4] Assuring professional independence
[NQAF 5] Assuring impartiality and objectivity
[NQAF 6] Assuring transparency
[NQAF 7] Assuring statistical confidentiality and security
[NQAF 8] Assuring the quality commitment
[NQAF 9] Assuring adequacy of resources

[NQAF 10] Assuring methodological soundness
[NQAF 11] Assuring cost-effectiveness
[NQAF 12] Assuring soundness of implementation
[NQAF 13] Managing the respondent burden

[NQAF14] Assuring relevance
[NQAF15] Assuring accuracy and reliability
[NQAF16] Assuring timeliness and punctuality
[NQAF17] Assuring accessibility and clarity
[NQAF18] Assuring coherence and comparability
[NQAF19] Managing metadata

Definition: Quality assessment

- Data quality assessment is an important part of the overall quality management system of a statistical agency or unit.
    - However, its scope is limited to the statistical products and the processes leading to their production.

Quality assessment methods and tools

Methods and tools for quality assessment comprise:*

1. User surveys
2. Quality indicators
3. Measurement and analysis of process variables
4. Quality reports
5. Self-assessment and auditing (internal or external quality reviews), including peer reviews
6. Approaches labelling and certification
7. Risk management

An efficient and cost-effective use of the methods requires that they are used in combination with each other. E.g. quality reports could be the basis for audits and user feedback.

*See: Eurostat: Handbook on Data Quality Assessment Methods and Tools, available at: http://ec.europa.eu/eurostat/web/quality/quality-reporting

Quality assessment methods and tools

Different levels of quality assessment:

❑ Level 1: Quality indicators and process variables, quality reports and user surveys are considered as starting point for quality assessment.

❑ Level 2: Audits and self-assessment constitute a next step or level of quality assessment.

❑ Level 3: Labelling and certification constitute advanced practices quality assessment

The first step of quality assessment is to gain a clear understanding of the quality concepts that are applicable to statistical outputs and statistical processes.

Methods and tools: user surveys

- User feedback is a crucial element of the set of information that is needed for quality assessments.

- The statistical agency should regularly consult its users about their needs and perceptions of quality, take them into account in the quality assessment exercise, and follow up on them, for example through meetings with them (e.g. focus group discussions) or in a more formalized way by using user satisfaction surveys.

- Since the main objective of user surveys is normally to get information on the users' perceptions as a basis for improvement actions, the results of them provide valuable inputs to self-assessment and auditing activities.

- There are different groups of users of statistics and hence different types of user surveys that can be carried out, e.g. standardized questionnaires, qualitative interviews or web-based surveys, etc. and the choice will depend on the type of feedback required and on the resources available.

Methods and tools: quality indicators

- The second step of quality assessment is the development of quality indicators.
- Quality indicators are specific and measurable elements of statistical practice that can be used to characterize the quality of statistics. The quality indicators measure the quality of statistical products or processes from several aspects, and for example, can give an indication of both output (e.g. timeliness) and process quality (e.g. response rates).
- Quality indicators allow to describe and compare the quality of different statistics and over time.
- When quality indicators are used to inform users on the quality of statistics, it is recommended to include qualitative statements helping to interpret quality information and to summarize the main effects on the usability of the statistics.

Methods and tools: quality indicators

- *Process quality variables* give an indication of the quality of the process. Measurement of key process variables is the basis for process management and continuous quality improvement. Process variables are often used as proxies for data quality and as quality indicators
- A selection of key process variables will assume an important role in self-assessments and audits as well as in labelling and certification. The key process variables are the variables which have the largest effect on product characteristics. Examples include resources and time used, response rates and response burden and error rates (in editing).
- *Process descriptions* are qualitative presentations of the statistical agency's processes, which generally follow a standard structure.

Methods and tools: quality reports

- Communicating about the quality of a statistical process or product can be accomplished through the preparation of reports that review and explain the main characteristics of the process and its products to users to enable them to assess the quality of the product.

- Because of the multi-dimensional nature of quality, the quality reports typically examine and describe quality according to those components or dimensions the agency has used to define its products' fitness for purpose, e.g. relevance, accuracy, reliability, timeliness, punctuality, coherence, comparability, accessibility and clarity.

- While the main target group of a quality report is the users of the statistics, quality reports are also an important monitoring tool for producers and managers.

- In the optimal case, the quality reports are presented according to a standard reporting structure to facilitate comparability and are based on specific quality indicators

Methods and tools: Self-assessment and auditing

- Based on the information collected using the tools mentioned, the quality of the processes and products can be evaluated and eventually labelled.

- Evaluation can be done in the form of self-assessments, audits or peer reviews which are very powerful approaches that allow organizations to check and review their processes/products.

- It can be undertaken by internal or external experts and the timeframe can vary from days to months, depending on the scope, however the results are fairly identical – the identification of improvement opportunities in processes/products. These approaches constitute an important element of the Plan-Do-Check-Act (PDCA) cycle.

Methods and tools: Self-assessment

- Self-assessments are comprehensive, systematic and regular reviews of an organization's activities and results referenced against a model/framework.

- The choice of the self-assessment tool is a strategic decision and its scope should be clearly defined. For example, it could be applicable to the whole institutional environment or simply to the statistical production processes.

- Oftentimes, self-assessment checklists are developed to be used for systematic assessment of the quality of the statistical production processes.

Methods and tools: Quality audits

- A quality audit is a systematic, independent and documented process for obtaining quality evidence concerning the quality of a statistical process and evaluating it objectively to determine the extent to which policies, procedures and requirements on quality are fulfilled.

- In contrast to the self-assessments, audits are always carried out by a third party (internal or external to the organization).

- *Internal audits* are conducted with the purpose of reviewing the quality system in place (policies, standards, procedures and methods) and the internal objectives. They are led by a team of internal quality auditors who are not in charge of the process or product under review.

- *External audits* are conducted either by stakeholders or other parties that have an interest in the organization, by an external and independent auditing organization, or by a suitably-qualified expert.

Methods and tools: Peer review

- Peer reviews are a type of external audit which aims to assess a statistical process at a higher level, not to check conformity with requirements item by item from a detailed checklist. It is therefore often more informal and less structured than an external audit;

- Normally peer reviews do not address specific aspects of data quality, but broader organizational and strategic questions.

- They are typically systematic examinations and assessments of the performance of one organization by another, with the ultimate goal of helping the organization under review to comply with established standards and principles, improve its policy making and adopt best practices.

- The assessment is conducted on a non-adversarial basis, and relies heavily on mutual trust among the organization and assessors involved, as well as their shared confidence in the process. In Europe, there is a system with peer reviews of compliance with the European Statistics Code of Practice.

Methods and tools: Certification and labeling

- The results of the assessment/evaluation phase can then be compared to defined standards and requirements to help to enhance trust and credibility in official statistics. This is often referred to as the labelling or certification layer.

Methods and tools: Labeling

- Labelling of statistics conveys a message about the extent to which a set of quality standards is met and it can be attached to statistics or a provider/producer of statistics.

- In the European Statistical System, labelling means compliance with the European Statistics Code of Practice.

- The attachment of a label needs a procedure to guarantee that the message is appropriate and true. The label as such may be brief, e.g. "official statistics", and in this case, it would need to be accompanied by explanations about its interpretation.

Methods and tools: Certification

- Certification is an activity which assesses whether a particular product, service, process or system (e.g. a quality management system) complies with requirements defined by an internationally recognized standard, or other formal criteria and hereby attaches a kind of "label" because the standard is internationally recognized as a guaranteed level of quality.

- It is conducted by an external independent certification body and the result of the successful certification is the certificate awarded to the organization by the certification body, such as the International Organization for Standardization.

- Certification to ISO Standards is an advanced method/tool of process quality management. It requires the documentation, quality reports, quality indicators, self-assessment and audit, as mentioned in this chapter. There are significant benefits but also costs associated with certification.

Methods and tools: Risk management

- Traditionally, RM has been applied within financial management, security and safety. Over recent years the scope of RM has been extended to modernisation and other development programmes and projects, and finally the production of statistics. Many NSOs have introduced or established risk management, and several are planning to do so.

- Risks are linked to objectives, and risk is defined as the product of the probability (or likelihood) of not achieving an objective and the effect of this. Objectives can be defined as compliance with the NQAF, or by for example avoiding serious errors.

- Risk and quality management frameworks are not alternatives, they are complementary and should not operate independently of each other. A coordinated approach is cost effective and facilitates management involvement and support.
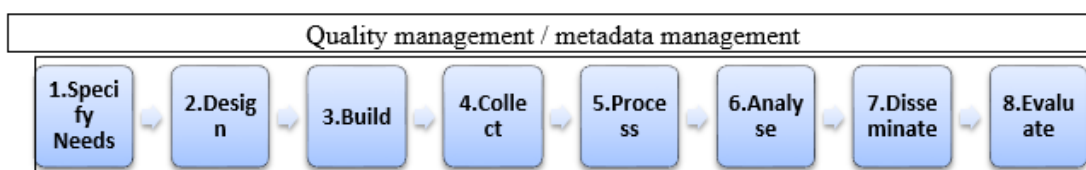
Relationship of quality management and assessment and GSBPM

- The improvement of data quality requires the improvement of statistical processes.

- The Generic Statistical Business Process Model (GSBPM) describes and defines the set of business processes needed to produce official statistics and hereby provides a framework for process quality documentation, assessment and improvement.

Generic Statistical Business Process Model (GSBPM) - The statistical production process and quality management

Quality management / metadata management							
1.Specify Needs	2.Design	3.Build	4.Collect	5.Process	6.Analyse	7.Disseminate	8.Evaluate

Relationship of quality management and assessment and GSBPM

- Quality management is defined in the GSBPM as over-arching process which includes quality assessment and control mechanisms. It recognizes the importance of evaluation and feedback throughout the statistical business process.

- Metadata management is recognized as another overarching process which closely linked to quality management.

Relationship of quality management and assessment and GAMSO

- GSBPM focuses on statistical production processes and does not cover statistical infrastructure and management and support functions. For these the Generic Activity Model for Statistical Organizations (GAMSO) (which incorporates GSBPM) provides coverage.

- GAMSO extends and complements the Generic Statistical Business Process Model (GSBPM) by adding additional activities needed to support statistical production (referred in GSBPM as over-arching processes). Hereby, GAMSO provides a broader context of corporate strategies, capabilities and support important for statistical quality management.

Why are GSBPM and GAMSO so useful for quality management for the SDGs?

- The GSBPM and GAMSO <u>establish a common language</u> when refereeing to statistical business processes and activities that take place within a typical statistical organization, which is very important for extending quality management and assurance to the entire national statistical system and additional providers of data and statistics.

- In particular, the GSBPM is intended to apply to all activities undertaken by producers of official statistics, which result in data outputs. It is designed to be independent of the data source, so it can be used for the description and quality assessment of processes based on surveys, censuses, administrative records, and other non-statistical or mixed sources.

THANK YOU