Istat Quality Management System

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Quality commitment and organisation supporting quality activities

Istat is highly committed to quality and Istat quality management system is developed in agreement with the European Statistical System Common Quality Framework and the principles of the ES Code of Practice, as reported in the Istat website[1].

Istat has not formally adopted a specific quality management model, like Total Quality Management, but its approach to quality is based on most of the core values of such models, such as commitment of leadership, process orientation, continuous improvement, staff involvement, etc.

The commitment on quality of Istat have been recently renovated by the top management. In September 2020 the Quality Committee has been reconstituted (a first Quality Committee was in charge from 2010 to 2016) and a Quality Manager has been formally appointed. The Coordinator of the Quality Committee is the Director of Methodologies. The Quality Committee has the mandate to oversee and coordinate all the activities dealing with quality across the institute. The Quality Manager with the support of the Quality Committee developed a proposal for a new quality policy for statistical production that has been approved by Istat top management in October 2021 and it is currently being implemented. After the approval, the quality policy have been released on the intranet to make it available to the staff and on the quality section of Istat website as well.

The Quality manager is also the responsible of the initiative "Methods and tool for quality and documentation of statistical processes and products" (referred as "quality team" in the next), within the "Methods, Quality and Metadata" Division of the Methodological Directorate, that is in charge of coordinating the implementation of the quality policy and of developing methods and tools for assessing the quality of statistical processes and products.

Istat approach to quality management

Quality management has a long tradition at Istat. It roots back to the '90s, when Istat adopted a systematic approach in order to ensure quality to statistical products, processes and services offered to the community.

Istat quality management system is essentially based on a set of tools and methods for the documentation, monitoring and assessment of the quality of statistical processes and products, jointly working for quality assurance and improvement. The reference framework is the DatQAM map[2], recently resumed in the UN NQAF Manual[3], and it is represented in figure 1.

The new quality policy is built upon the existing approach, it proposes a set of actions to renovate the tools and methods taking into account the innovations due to modernisation process that Istat started in 2016. Indeed, in 2016-2020 Istat carried out a modernisation process that implied great changes in the statistical production. The Integrated System of Statistical Registers (ISSR) has been built: it consists in a number of coherent registers to produce several types of statistical outputs. Each ISSR register is obtained by integrating sources of different typology, mainly administrative data, but also survey results or other registers, such as to create new processes that can vary a lot in complexity. In addition, new data sources started to be exploited. Furthermore, the stove pipe organisation of statistical processes has been overcome through the centralisation of some relevant functions, like Data collection and Methodologies.

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[1] https://www.istat.it/en/organisation-and-activity/institutional-activities/quality-commitment
[2] Eurostat (2007) Handbook Data Quality Assessment Methods and Tools
https://ec.europa.eu/eurostat/ramon/statmanuals/files/Handbook_on_data_qual_assess_tools.pdf
[3] UN (2019) United Nations National Quality Assurance Frameworks Manual for Official Statistics
https://unstats.un.org/unsd/methodology/dataquality/un-nqaf-manual/

Figure 1 Quality tools and methods and quality assessment
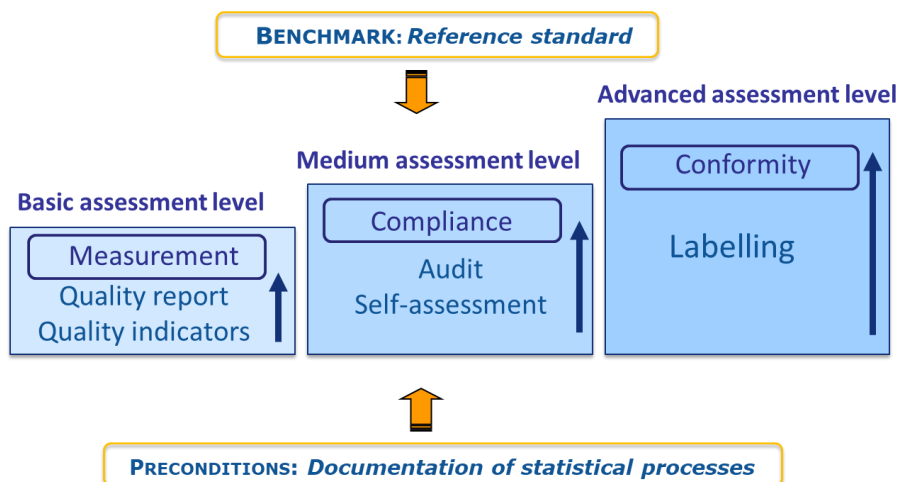
As will be described in the next sections, starting with information systems for the documentation of statistical processes and proceeding step by step towards more advanced levels of assessment, Istat is reaching the conformity level for its "traditional" processes (e.g. surveys) while it is building a similar infrastructure for innovative processes (e.g. multisource process or Trusted Smart Statistics).

Information systems for quality documentation and quality indicators

Istat has always recognised a high value to the documentation of statistical processes, developing the SIDI-SIQual system in the beginning of 2000s, as a precursor of the Generic Statistical Business Process Model[4] (GSBPM), to which the SIDI-SIQual model can be mapped.

SIDI-SIQual is the official information system for documenting quality and reference metadata of the Istat statistical production processes (surveys and secondary studies). The system describes the production process and its features, with particular reference to quality issues: information content; data sources, survey phases and subprocesses; actions to prevent, monitor and evaluate sampling and non-sampling errors, dissemination products. The documentation in SIDI-SIQual is also accompanied by several process and product oriented quality indicators, allowing the monitoring of the quality and performance of Istat statistical processes.

The system is composed by SIDI that is the management system where the metadata and quality indicators are entered, available internally after authentication, and SIQual, that is the consultation system for the information entered in SIDI. SIQual system has 2 versions: one for external users (https://siqual.istat.it), one for internal users. The internal version of the system includes standard quality indicators. SIDI is updated regularly by a net of quality pilots trained, supported and coordinated by the quality team.

Unfortunately SIDI-SIQual is not flexible enough for documenting innovative and complex multisource statistical processes of ISSR and it is also obsolete from an IT point of view, so Istat started a three-year project on the design and development of a new metadata system, called METAstat. The new system will manage both structural and reference metadata and will be compliant with all international standards related to quality and metadata (e.g. GSBPM, GSIM[5], SIMS[6], etc.).

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[4] https://statswiki.unece.org/display/GSBPM/GSBPM+v5.1

[5] https://statswiki.unece.org/display/gsim
[6] https://ec.europa.eu/eurostat/data/metadata/metadata-structure

Beside SIDI-SIQual, Istat can count on another internal Information system on quality: the Quality Report Card for Administrative data (QRCA), that is a documentation system managed by the Directorate for Data Collection, aimed at evaluating the input quality for the statistical production processes based on administrative data. It is also aimed at informing internal users about the usability/quality of administrative data acquired. It contains information about the administrative source and their relevance for Istat, the dataset compliance with respect to data requested, its timeliness, integrability, stability, metadata description.

Quality reporting

According to EU Reg. 223/2009, statistical processes that produce European Statistics are required to accompany their results with metadata information, which is organized in appropriate quality reports. At Istat, activities related to quality reporting are carried out by the production sector; however, the quality team offers methodological and technical support for quality reports compilation and transmission. Training courses on quality reporting are also delivered regularly. From the operational perspective, quality reports can be compiled using the tool made available by Eurostat (the ESS Metadata Handler) but for many processes it is possible to make the procedure easier by retrieving the quality information already provided in SIDI-SIQual. Indeed a subsystem of SIDI-SIQual is able to produce SDMX[7] files, pre-filled in with information from SIDI-SIQual database and edited as needed, that can be uploaded in the ESS Metadata Handler, reducing the burden for production sectors and assuring coherence between metadata at national and international level. Since 2016 the quality reports validated by Eurostat that are produced through SIDI-SIQual are also disseminated through SIQual[8].

In addition, since 2018 at national level Istat produces and disseminates on Istat website National quality reports (Schede standard di qualità[9] - in Italian) for all statistical processes. Such reports are based on the ESS standard Single Integrated Metadata Structure, SIMS. They are produced through SIDI-SIQual, updated annually and, before publication, they are validated by the Head of the Division responsible for the statistical process. In the new Istat quality policy is also planned to improve these quality reports, on the one hand improving the adherence to SIMS (not all the sections are included at the moment) and on the other hand developing the English version.

Quality guidelines and sound methodological tools

Quality guidelines for statistical processes contain the principles for planning, executing and assessing statistical processes and the description of the methods to ensure the compliance to the principles. Istat has produced several quality guidelines: guidelines for survey processes in 2012[10], for statistical processes based on administrative sources in 2016[11], for statistics produced by the National Statistical System in 2018[12]. This last manual integrates good practices concerning survey processes and statistics based on administrative source. The quality guidelines are also considered as the reference standard for the assessment of both process and product quality.

Since 2016, with the modernisation process, the Directorate for Methodologies has been established, and methodological guidance and support is provided to production structures by means of internal service agreements. At the end of 2020 the Directorate for Methodologies started a project for the design and

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[7] https://sdmx.org/
[8] https://siqual.istat.it/SIQual/docQualityReport.do
[9] https://www.istat.it/it/metodi-e-strumenti/strumenti-per-la-qualit%C3%A0/schede-standard-di-qualit%C3%A0
[10] https://www.istat.it/it/files//2013/04/QualityGuidelines_EngVers_1.11.pdf
[11] https://www.istat.it/it/files//2013/04/Linee-Guida-v1.1-Versione-inglese.pdf
[12] https://www.istat.it/it/files/2018/08/Linee-Guida-2.5-agosto-2018.pdf, only in Italian

development of a catalogue of methods and methodological tools. Such catalogue will be a further reference both as a methodological guidance to carry out statistical process and also for assessment.

Compliance and conformity

In the period 2010-2016 a cycle of audit and self-assessment on 80 Istat statistical process, mainly surveys, has been carried out. Assessment was carried out against the quality guidelines.

After the modernisation, for traditional processes like surveys, for which there is high confidence that sound methodologies are applied, a further step in the quality assessment methods can be done. The new quality policy proposes to verify conformity of these processes to sound methodologies and practices through a checklist.

The checklist structure follows the phases and, in some cases, the sub-processes of the GSBPM, and it is inspired by the existing quality guidelines. The checklist is quality-oriented, therefore, it records quality actions, availability of specific quality indicators for each phase, any risks that may affect quality and all process innovations and standardizations implemented. Each element of the checklist is able to identify a weakness and so a potential improvement. The aim of the checklist is to identify the processes that comply with all the sound practices applicable in their specific situation. In this case, an internal label is assigned. Otherwise, improvement actions are identified and implemented. A specific quality review through an audit-like procedure follows for a limited number of statistical processes. The quality reviews are scheduled annually within a three-year cycle, since the checklist should be repeated every three years. The checklist has been developed, tested on some statistical processes and finalised. By the end of 2022 the checklist will be applied for the first time to all traditional processes.

Building a quality assurance infrastructure for ISSR processes

For ISSR complex multisource statistical processes there was the need to develop a tailored system for documenting, monitoring and assessing quality. This task was assigned to two subsequent Istat working groups that run from 2019 to 2021. The model developed for documenting the process was based on the international standards GSBPM and GSIM. The GSBPM subprocesses needed to describe the SIR processes were first identified, while the information to be documented for each subprocess were defined according to the GSIM, following the approach defined in the UNECE Linking GSBPM-GSIM task team[13], tailoring some concepts and introducing some additional ones. Great focus has then been given to the definition of quality indicators to monitor and evaluate the quality of each subprocess. The model and the quality indicators were tested and finalised. Such quality indicators, together with metadata useful for their interpretation, will be implemented on the one hand in the registers monitoring systems (for monitoring purposes) and, on the other hand, in the new metadata system, METAstat (for documentation and assessment).

The next step in the roadmap for ISSR processes quality assessment and improvement will be the definition of specific quality guidelines for statistical registers.

## Quality framework for Trusted Smart Statistics

Trusted Smart Statistics are every day gaining more and more relevance, but are still a step back (with respect to other type of processes) in terms of sound methodology for producing Official Statistics. Thus the first step towards a systematic quality assessment for this kind of processes will be the establishment of a clear reference quality framework, identifying the quality dimensions and the main error sources to be taken into account for quality assessment, obviously taking stock of the available international experiences and proposals.

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[13] https://statswiki.unece.org/pages/viewpage.action?pageId=330370507

Figure 2 associates the tools and methods used or being developed by Istat to the general quality assurance framework of figure 1.

Figure 2. Istat quality assessment methods and tools
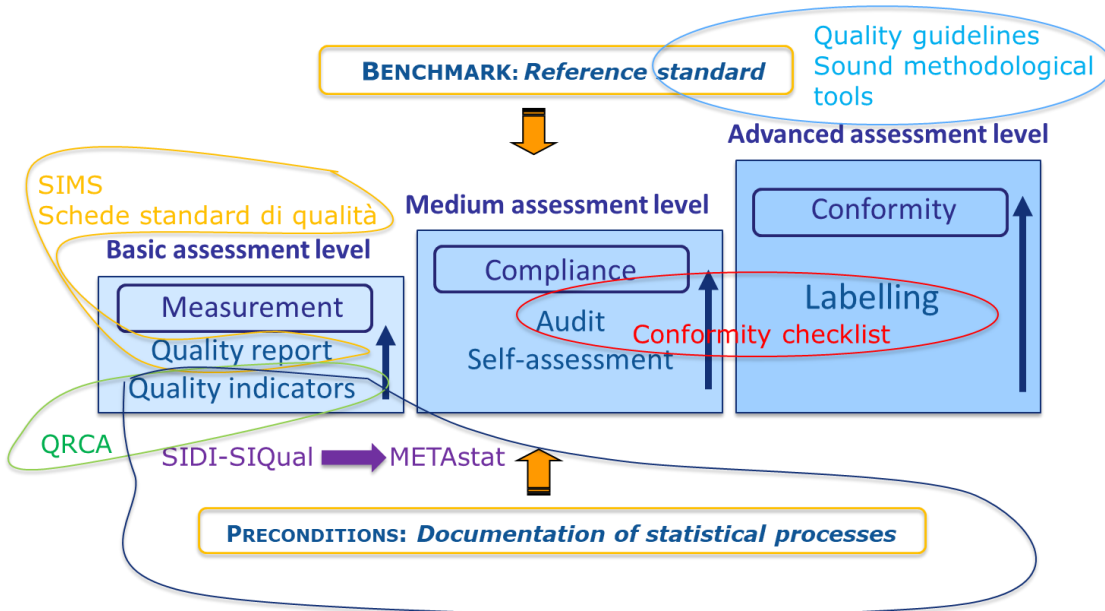
Relationships with stakeholders

As already mentioned, behind the quality assurance procedures, Istat quality management system takes into account also the main core values of quality management models, including e.g. users orientation and involvement of staff.

Concerning users, in order to derive information needs, indirect methods, based on the analysis of the already available information, are used. For example, user requests submitted via email, or feedback posted on the website are analysed. In addition, Istat Dissemination Directorate carries out regular User Satisfaction Surveys on website products and services, whose results are analysed and reported to the users.

With regard to data providers, Istat puts in place some activities with two main directions: increasing transparency and reducing response burden. In order to achieve these goals, Istat worked on the one hand at the standardization of information about surveys available on the institutional website[14] and on the other hand on exploiting administrative data, offering data collection modes, improving questionnaires, training interviewers and centralization of contact point for respondents.

Involvement of staff in quality management is another main issue of Istat quality approach. Training on quality has a long tradition in Istat. Since 2000s' Istat has provided several type of training course. The current training programme on quality is diversified, and it is aimed at satisfying different needs of the Institute.

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[14] https://www.istat.it/it/informazioni-e-servizi/per-i-rispondenti (in Italian)

Quality of the National Statistical System

In the last years, a great investment on strengthening the coordination role of Istat in the National Statistical system has been done. Several activities have been carried out for supporting the quality improvement of the statistics produced by the National Statistical System (Sistan). They are coherent with the Istat quality management system and they are considered as part of the Istat quality policy. First of all, as already mentioned, the Quality guidelines for statistics of the National Statistical System (in Italian) have been developed. Then a programme of audits on the statistical processes conducted by the Other National Authorities (ONAs) producing European Statistics, was carried out (2018-2021). For other bodies of the Sistan not producing European Statistics (not–ONAs), for which a new version of the Italian code of practice has been issued in 2022, a national quality assurance framework, mirroring the ESS Quality Assurance Framework, is being developed.