

Statistical Quality Auditing for Compliance based on the Eurostat Model

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Abstract

Production of high quality statistics depends on the assessment and auditing of statistical data and related processes. Without methodical quality assessments and auditing of statistical data, National Statistical Offices risk the control of good statistics that are not only a necessary part of the enabling environment for global development, but also a stimulant to public action, a catalyst for change, and an input into making reforms work. At the same time, assessments and audits are a prerequisite for informing the users about the possible uses of the data, or which results could be published with or without a warning. Indeed, without good approaches for statistical quality auditing, National Statistical Offices are working in the blind and can make no justified claim of being professional and of delivering quality in the first place. Statistical auditing is undertaken to assess compliance to agreed national and international statistical standards and best practices. It informs certification of official statistics. The study provides a flexible, comprehensive structure, and homogeneous approach to Statistical Quality Auditing for compliance drawing from the Eurostat Statistical Auditing Framework.

Keywords: Statistical Auditing, Quality Statistics, Compliance, Standards, Assessment, Certification, Quality Improvement

INTRODUCTION

Statistics has become ubiquitous and there is no aspect of modern life upon which it does not impinge. World over, statistics is getting more into the spotlight, hence requiring re-positioning of the statistical function to reflect its frontline position in national development (Uganda Bureau of Statistics, 2014). The World Bank (2004) development Report places strong emphasis on the role better statistical systems can play in improving the quality of services – as a stimulant to public action, a catalyst for change, and an input into making reforms work. The demand for good (quality) statistics has increased tremendously in the last decade or so because governments and development partners have put new focus on managing for development results or results agenda, which is about achieving development outcomes and impact for sustained improvement in people’s lives: more children educated, fewer infants dying, more families lifted out of poverty, etc.. Demand for data has been increasing in context of the results agenda manifested both at national level (use of data within the country) and at international level (use of data outside the country). Legitimacy of statistical information depends both on the quality of the underlying statistics and the trust users have in the statistics. Both the quality of statistics and the trust that users have in them are a direct reflection on the agency that produces them. The reputation of the agency determines the level of trust of the statistics it produces. Practically all statistical quality frameworks and codes of practice, especially the UN’s Fundamental Principles of Official Statistics and the National Quality Assurance Framework (NQAF), highlight the importance of institutional factors as the basic foundation for statistical quality. Accordingly commitment by the leadership of a statistical agency to pursuing quality and to creating a culture in which quality is recognised as a cornerstone of statistical work is a must (African Union, 2015). Evidence-based reporting on trends and performance on such initiatives requires data and information. Data should be of good quality in order to support policy and decision-making as well as monitoring and evaluation frameworks. They should be produced in line with national and international quality standards so that they are “fit for purpose”. (Uganda Bureau of Statistics, 2014; Uganda Bureau of Statistics, 2006). Several efforts of implementation of data quality assessment and statistical auditing approaches have been undertaken in recent years. Also a number of National Statistical Institutes (NSIs) have developed these approaches (Bergdahl and Lyberg 2004).

African countries such as Uganda, Ethiopia, Rwanda, Seychelles, and South Africa, among others, are gradually adapting international frameworks to assure the quality of their official statistics. The adaptations are founded on International Monetary Fund (IMF’s) DQAF and its various derivatives especially Statistics Canada’s Quality Assurance Framework and the Quality Assurance Framework of the European Statistical System (African Union, 2015). Increasingly, National Statistical Offices (NSOs) worldwide continue to value quality in the production, management and publication of statistics that conform to recommended international standards and satisfy the requirements of their users. As such, they have adopted quality standards which provide guiding frameworks for statistical quality assessments, quality audits, continuous improvement and certification of official statistics.

LITERATURE AND RELATED WORKS

Today's organizations are compelled to obtain Quality Systems (QS) certification in response to the demands of customers and business conditions (Marshall, 2002; Tsim et al, 2002). In order to meet this requirement at a faster rate, Quality auditing exercises are being carried out hurriedly as a part of QS certification process (Karapetrovic and Willborn, 2000a). Because of this trend, the hidden agenda of quality audits are not realized in majority of today's organizations and as a result, its authentic benefits are not fully nourished. To be precise, organizations view quality auditing only as a checkpoint, which has to be crossed to obtain QS certification. The fact is that a suitably timed and properly organized quality auditing programme will lead to continuous quality improvement (CQI) (Beecroft, 1996). Willborn (1990) identifies two types of quality auditing approaches. Distinguishing between both types of auditing renders audits and auditing more effective and adaptable and supports quality improvement. Static quality auditing (SQA) examines compliance with applicable standards and follows the audit plan closely, while dynamic quality auditing (DQA) examines compliance and opportunities for improvement and adapts the plan and goal during execution when necessary. In DQA, the question to be answered by the auditor is whether the adaptations appear justified or not. Under SQA, the answer is left entirely to the supervisor and manager in charge. Writers and auditing standards encourage auditors in assessing effectiveness and contributing directly to quality improvements.

Eurostat (2007) defines audit as a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled. The international standard (ISO,2015), from which the definition was derived, provides guidance on the audit principles; on how to manage audit programmes, and how to conduct audits to quality management and environmental management systems, as well as guidance on the competence of the respective auditors. It assumes that auditing is a powerful tool that supports policies and management control actions by providing important information that enables an organization to improve its performance. This reference is also applicable to any organization that wishes to conduct internal or external audits to its quality management and/or environmental management systems or to the simple organization, planning and management of an audit programme. Even though the organisation has not developed a quality management system it can also be a reference for organising audits in any organisation. As such this approach can be applicable to all processes in an organisation, and to any type of organisation, a statistical organization is no exception. Further, the ISO 19011:2011 standard provides guidance on auditing management systems, including the principles of auditing, managing an audit programme and conducting management system audits, as well as guidance on the evaluation of competence of individuals involved in the audit process, including the person managing the audit programme, auditors and audit teams. The standard is applicable to all organizations that need to conduct internal or external audits of management systems or manage an audit programme (ISO,2011).

Context for Quality Auditing based on the Eurostat (2007)

Statistical auditing is a mechanism for data producers to; evaluate strong and weak points in their statistics and related processes and formulate proposals for the continuous improvement. Statistical auditing is not a form of “policing” but rather an advisory mechanism for continuous quality improvements (Eurostat, 2007). The auditing exercise also identifies weaknesses or areas of non-conformity (non-compliance) with a quality standard. These areas are documented and shared with the auditee (Organization being audited) for improvement action. Statistical auditing is not a form of “policing” but rather perceived as a form of helping and advising on quality improvements. Generally, statistical audits are conducted to; present an evidence-based report on the quality of an indicator and its level of compliance with the quality standard; conceive advice based on the findings to support relevant quality improvements; concretize relevant documentation for the statistical processes and outputs, and, inform the certification process. Figure 1 below illustrates the Eurostat (2007) Statistical auditing approach. As a best practice, this approach has been applied in various Statistical Organizations including the Uganda Bureau of Statistics.

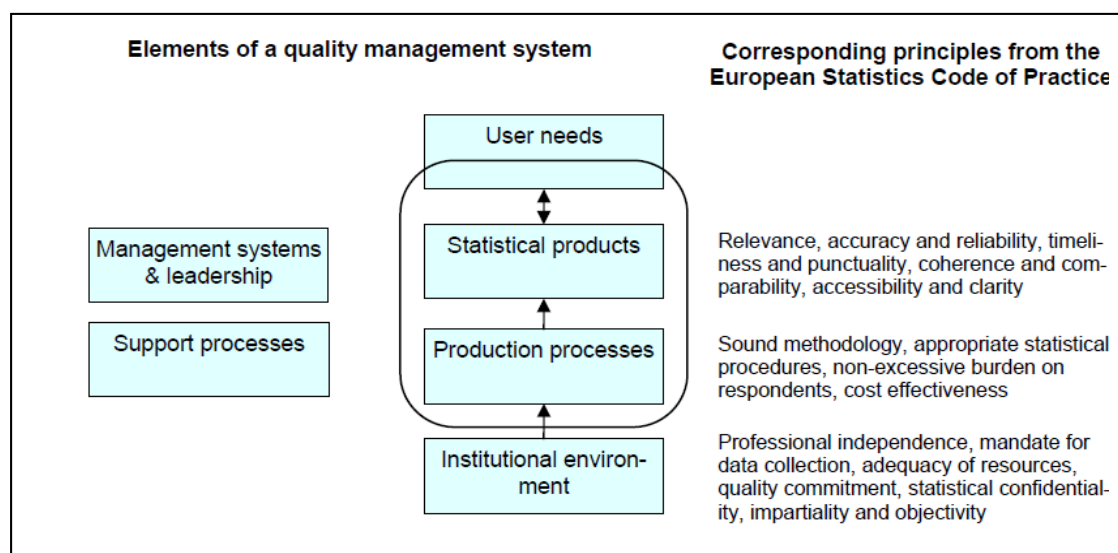


Figure 1: Context for Statistical Auditing Model based on the European Statistics Code of Practice (Eurostat, 2007)

Based on figure 1 above, Statistical Quality Auditing for Compliance with the Code of Practice Requirements (*the 15 Principles, Practices & 3 Protocols*) covers 4 major aspects namely; the Institutional Environment, Production Processes, Statistical products and User Needs (Eurostat, 2007; Uganda National Bureau of Standards, 2012). Similar to the 3 aspects mentioned, needs are identified and perceptions assessed to determine the level of satisfaction users have with statistical products in an effort to ensure maximum use, public trust and value in statistics.

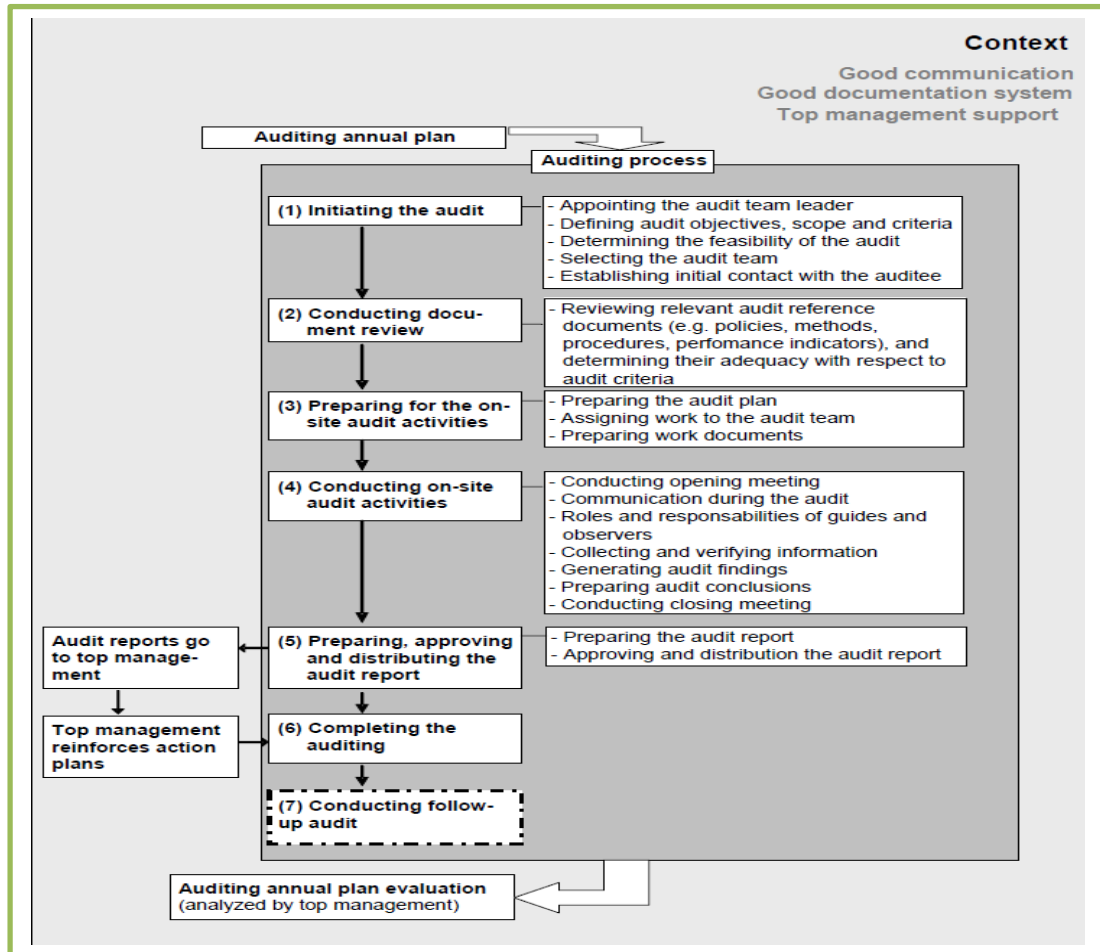
Practical approach to Statistical Quality Auditing for compliance based on Eurostat (2007)

To ensure compliance, statistical quality audits are undertaken following systematic statistical quality self-assessments where the organization conducts internal quality checks and reviews of their production processes and products in line with the requirements of recommended quality standards. The outcome of the auditing process provides a basis for Certification of Official Statistics.

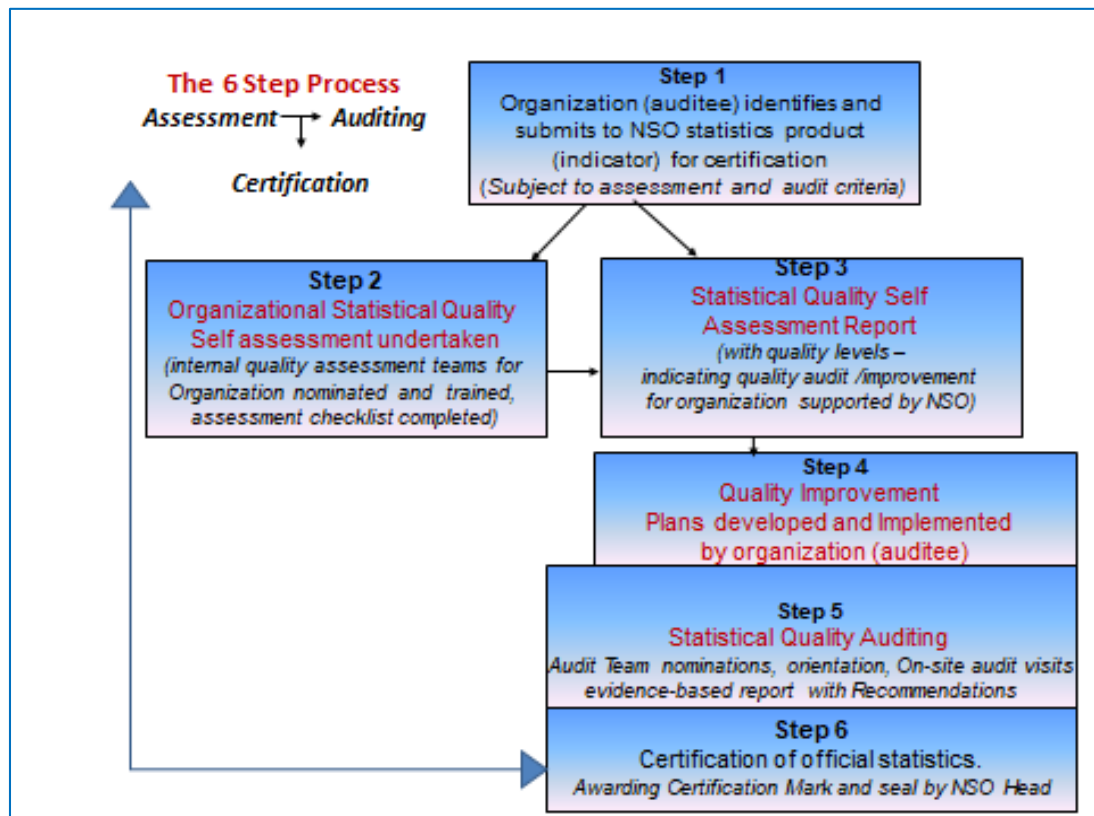
Certification is an elaborate procedure which involves quality approval of the statistics that pass the quality audit with clear recommendations for certification, and the awarding of a Certification Mark and seal by the Head of a National Statistical Office in a given country, designating the statistics as official. Statistical Quality Auditing applies to all kinds of statistical processes namely; surveys, censuses, research studies, and administrative data compilations. The auditing is conducted through an interview process of the auditor and auditees (organization whose statistics are being audited) as well as analyzing relevant documentation. Auditors should have reference documentation provided by the organization whose statistics are being audited to conduct this type of audits. Statistical Quality Audits can be conducted by both internal and external teams to determine whether the audited statistical process/product complies with the requirements in the quality standards.

Internal audits are conducted with internal teams not in charge of the process/product under review for the purpose of reviewing the processes and products in line with the quality system requirements (policies, standards, procedures and methods) and internal objectives. External audits are conducted by selected external expert/s that has interest in the organization and the product/process; or external and independent auditing organizations. Statistical Quality Audits are conducted against audit reference documents related to processes (Procedures and/or working instructions) or products (specifications). To perform an audit, required documentation, records, statements of fact or other information, which are relevant to the audit criteria verifiable are provided by the organization whose statistics will be audited. Preparation for a statistical quality audit is very important for both auditors and auditees. Good communication in the auditing process is critical, as such auditing should also be seen as an involving and engaging activity. The audit process should promote discussions with the auditees as this allows for the identification of improvement opportunities. The conclusions of an audit process should be summarized in an audit report. The statistical quality audit report must be accepted by the auditees as a basis for an action plan for improvement or certification of official statistics. Audit reports should be made available to the team involved in the audit; else a summary of the main findings should be publicly available to the organization. Generally, internal audits may last five to ten working days if the processes and the requisite reference documentation are in place. However, if documentation is scanty and the auditees have not prepared adequately, statistical auditing may take more than ten working days.

Figure 2 below presents an elaborate statistical audit plan that guides organizations planning to conduct statistical quality audits (Eurostat, 2007).



It is critical for statistical organizations and respective data producers to be aware that any delays in conducting the auditing exercise may negatively impact the timing for certification of the audited statistics. However, it is also important to note that well planned statistical quality audits for large statistical processes including national surveys or censuses may take one month and beyond given the coverage of the exercise. Summarily, figure 3 proposes a 6 step process for statistical organizations and respective data producers and managers to apply as they undertake the auditing preliminaries (statistical assessment planning and execution in steps 1 to 4), the auditing exercise in steps 4 and 5 and the certification process effected after the auditing exercise by the National Statistics Office (NSO) head in step 6.



Practical implications

The leadership in National Statistical Offices, Institutes and Organizations is becoming more aware of emerging trends in quality systems worldwide and related research. As a result, they are more likely to make evidence-based decisions about instituting statistical quality audits within their existing statistical development systems.

Originality/value

The paper evaluates existing research and proposes a practical approach to statistical auditing for compliance with quality standards for statistics.

REFERENCES

- [1] African Union., 2015, "A Draft Statistical Quality Assurance Framework for the African Statistics System," UN Statistics Division Economic Affairs Department.
- [2] Beecroft, G.D., 1996, "Internal quality audits-obstacles or opportunities," Training for Quality, 4 (3), pp. 32-4.

- [3] Bergdahl, M., and Lyberg, L., 2004, "Quality Management at Statistics Sweden: Current Work and the Future," Paper presented at the European Conference on Quality and Methodology in Official Statistics (Q2004), Mainz, Germany, pp. 24-26.
- [4] Eurostat., 2007, "Handbook on Data Quality Assessment Methods and Tools," European commission.
- [5] ISO., 2011, "ISO 19011:2011: Guidelines for auditing management systems," International Organisation for Standardisation. Geneva, Switzerland.
- [6] ISO., 2015, "ISO 9000:2015. Quality Management Systems: Fundamentals and vocabulary," International Organisation for Standardisation. Geneva, Switzerland.
- [7] ISO., 2015, "ISO 9001:2015. Quality Management Systems: Requirements," International Organisation for Standardisation. Geneva, Switzerland.
- [8] Karapetrovic, S., and Willborn, W., 2000a, "Quality assurance and effectiveness of audit systems", *International Journal of Quality & Reliability Management*, 17 (6), pp. 679-703.
- [9] Marshall, G.H., 2002, "The Scottish quality management system: an interim evaluation", *Managerial Auditing Journal*, 17 (5), pp. 251-60.
- [10] Tsim, Y.C., Yeung, V.W.S., and Leung, E.T.C., 2002, "An adaptation to ISO 9001:2000 for certified organizations", *Managerial Auditing Journal*, 17 (5), pp. 245-50.
- [11] Uganda Bureau of Statistics., 2014, "Plan for National Statistical Development," Kampala, Uganda.
- [12] Uganda Bureau of Statistics., 2006, "Plan for National Statistical Development," Kampala, Uganda.
- [13] Uganda Bureau of Statistics., 2014, "Strategic Plan for Statistics: Enhancing Data Quality and Use," Kampala, Uganda.
- [14] Uganda National Bureau of Standards., 2012, "Uganda Standard:US 942 Code of Practice for Official Statistics," Kampala, Uganda.
- [15] Uganda Bureau of Statistics., 2012, " Compendium of Statistical Concepts and Definitions," Kampala, Uganda.
- [16] World Bank., 2004, "Making services work for poor people – Overview," *World Development Report*, Washington, DC, World Bank Group. <http://documents.worldbank.org/curated/en/527371468166770790/World-Development-Report-2004-Making-services-work-for-poor-people-Overview>
- [17] Willborn, W., 1990, "Dynamic auditing of quality assurance: Concept and method," *The International Journal of Quality & Reliability Management*, 7(3), 35. Retrieved from <https://search.proquest.com/docview/197638387?accountid=62746>