

Official Statistics Quality Auditor; new role in National Statistical System

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Abstract: Production of high-quality statistics depends on the assessment and auditing of statistical data and related processes that includes all components in the National Statistics System (NSS). In the process of modernization of official statistics, National Statistical Offices (NSO) have been trying to replace surveys with the administrative data and as a result the quality of surveys change to assessment of the quality of these sorts of data or statistical products. NSOs has been facing with the big challenge of assessing process due to the huge number of statistical products, a different production processes and lack of expertise statisticians or quality assessor. This paper aims to propose a process of upspring the quality assessors, and discusses on opportunities and challenges accosted with. Being more common between NSOs, this process can be considered in other countries and can be customized regarding to each country texture and NSS structure. The assessor or auditor can be considered and as new position in the quality assessment of official statistics and cause to improve the products' quality and responsive producers.

Keywords: Official Statistics, National Quality Assurance Framework (NQAF), Quality auditor, register- based statistics, administrative process

1. Introduction

Statistics are used to help make important decisions. To properly inform those decisions, users need to know about the quality of the statistics and how this feeds through into effective use. Official statistics play a critical role in this context and applied research, using official statistics, needs to ensure the generation of high-information quality. Quality assessments are important in all contexts, to ensure that the data and resulting outputs meet your needs. In an administrative data context however, as the data are often used for a purpose that is different from the reason for initial collection, there are some unique considerations to make. The first step in any quality assessment is deciding what quality looks like for your scenario. What do the data need to do and have, to ensure you can produce what you need?

These decisions should not only factor in what high quality is to you and your user, but also the time and information you have, and any costs associated with conducting assessments or improving aspects of quality. Proportionality is a core principle of quality assessment (discussed more below). The concept of Information Quality, or InfoQ provides a general framework applicable to data

analysis in a broader sense than summary statistics: InfoQ is defined as “the potential of a data set to achieve a specific (scientific or practical) goal by using a given empirical analysis method.” [1]. The quality matters are not related to the statistics that are mainly produced by National statistical offices. 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 [4]. The same terminology should be applied for other types of statistics that are producing by statistics department in administrative bodies. There are different types of statistical structure that affect the process of official statistics.

In the side of structural design, National Statistical Systems (NSS) have been classified as "centralized" or "decentralized". Given their distinctive features, centralized statistical systems can be more efficient, but decentralized systems can be more effective. Regardless of the extent of centralization or decentralization of a statistical system, the eighth Fundamental Principle of Official Statistics (FPOS) is of utmost relevance – coordination among statistical agencies within countries is essential to achieve consistency and efficiency in the statistical system. The coordination of the NSS is usually the function of the National Statistics Office (NSO) and the Philippines is probably the only country where the coordination of the NSS rests in a separate agency created specifically for the purpose [2].

Coordination of the work of the members of the NSS is essential for improving and maintaining the quality of official statistics. Principle 1 is supported by principle 8 of the Fundamental Principles of Official Statistics.(Requirement 1.1)A statistical law establishes the responsibilities of the members of the national statistical system, including its coordination. Its members are identified in a legal or formal provision. (Requirement 1.2: There are a body and mechanisms for the coordination of the national statistical system for activities at the local, national, regional and international level. (Requirement 1.3) There is a mechanism for considering statistics produced outside the national statistical system and, if appropriate, for those statistics to become official.(Requirement 1.4) There is a national plan or programme for the development and production of official statistics [3].

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 [5].

In Iran, Official statistics were compiled based on the country's national statistics development program and the list of official statistics, custodians and conditions of their production was communicated to the custodian institutions by the Supreme Council of Statistics in 1400. According to this instruction, the institutions in charge of producing official statistics are obliged to publish the desired statistics according to the publication calendar and make them available to users by observing the fundamental principles of official statistics and international standards. One of the most important and key issues in this regard is the quality of production statistics. In order to evaluate and monitor the quality of the official statistics produced, Iran Statistics Center has defined three quality marks, which are based on importance:

1. Quality assurance
2. Commitment to quality
3. Attention to quality

2. Definitions and Abbreviations

Official statistics: according to the standard definitions of the Iranian Statistics Center, official statistics are the statistics required for the country's governance decisions, which are produced and communicated by the executive bodies, and its title is included in the "List of Official Statistics of Iran".

Quality assessment: It is a part of quality assurance that focuses on evaluating the level of fulfillment of quality requirements.

Quality audit of official statistics: 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 [6]. It is a natural or legal person who is introduced to the applicant organization by the quality assessment technical committee of Iran Statistics Center to supervise the evaluation of production statistics in the country's organizations, within the framework of the powers determined in the contract documents.

In this regard, the quality technical committee in the Iranian Statistics Center is responsible for designing, controlling and monitoring and awarding the quality mark. The members of the technical committee consist of subject statistics experts of the executive bodies and statisticians of the Iranian Statistical Center, whose members have been notified by the head of the Iranian Statistical Center. According to the notification instructions, in order to receive any of the above badges, it is necessary for the executive bodies to prepare the relevant documents and documents and submit them for the approval of the quality auditor expert.

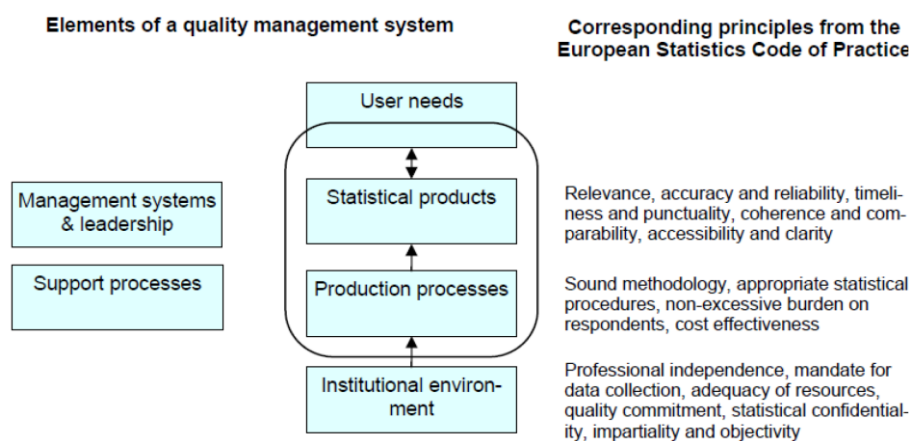


Figure 1. Context for Statistical Auditing Model based on the European Statistics Code of Practice (Eurostat, 2007)

3. Levels and conditions of official statistics quality audit

According to this recipe, quality auditors are classified in the following three levels:

- 1- Expert quality audit / Level 1
- 2- Excellent quality audit / Level 2
- 3- Basic quality audit / Level 3

There are more Articles too so as to cover the different circumstances for auditors. For example, based on the approval of the quality technical committee, each implementing agency applying for a quality mark must submit documents and documents to receive or renew its quality certificate, and receive the seal of approval of the quality inspector based on the following template. Also, the quality auditor's fee is determined annually by the technical committee, taking into account the annual inflation rate of the entire country, and the organization applying for a quality certificate is obliged to pay this amount after deducting legal deductions.

Table1. Different levels of quality assurances for official statistics

badge type	Quality audit level Required	The fee
quality guarantee	1st grade auditor as chief auditor and 3rd grade auditor	Determine based on the approval of the bureau of statistics
Commitment to quality	2nd grade auditor as chief auditor and 3rd grade auditor	
Attention to quality	Level 3 auditor (maximum 2 people)	

In order to make a schedule for efficient managing the quality assessment requests and optimized assignment of quality auditors, considering some technical notifications are recommended, here are some important notes:

Note 1: The review of any request for obtaining/extending the quality certificate is subject to the approval of the documents by the quality auditor, and the requests that do not have the aforementioned approval will be removed from the agenda of the technical committee.

Note 2: Devices applying for obtaining/extending a quality certificate do not have a limit on the number or time in sending the number of requests to the technical committee during the year.

Note 3: The number and type of inspectors can be changed according to the quality technical committee's judgment and based on the type of device and its workload.

Note 4: The proposed fee is determined for each official statistic produced in the applicant's device. Since there may be a common process for several statistical products, the quality technical committee can decide on the integration of products, integration of processes and related costs, if necessary, if the device requests.

4. Audit qualification conditions

Quality auditors must meet the general and specific requirements set by the technical committee and those who are interested to become an auditor should meet the eligibility criteria that always are determined by the quality committee in the core statistical center. Generally, 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 [7,8,9]. Here some general and specific conditions for case of Iran are presented.

4.1. General conditions

The approval of the auditor's competence is determined according to the scope and scope of the audit activity. generally:

- 1) Adhere to the basic principles of official statistics and undertake to maintain the confidentiality of the organization's data.
- 2) Written and verbal communication skills at a good level in order to communicate with different people and the ability to present relevant reports to the technical committee.
- 3) The ability to review and analyze information in order to control the documents and documents related to receiving the quality mark.
- 4) The ability to make decisions to remove obstacles and ambiguities on the way to the audit of documents and documents related to receiving the quality mark.
- 5) Computer Skills, related software, MS office, Scheduling and data analysis etc.
- 6) Creative approach in solving problems, in order to solve issues and problems at the time of handling and prevent the transfer of problems to the next steps.
- 7) Having firm determination and will, in order to carefully check the documents and documents sent by the organization applying for the quality mark.

4.2. Specific conditions

Acquaintance with the necessary measures to obtain a "quality certificate"

- 1) Familiarity with the national quality assessment framework provided by the United Nations
- 2) Evaluation of the process of producing official statistics by the certificate applicant
- 3) Realization of the axes related to the quality certificate, the data workflow process in executive bodies
- 4) Familiarity with the administrative laws and regulations in the country with the structure of the statistical system, their components and duties

Each of the audit levels of the following specific conditions must be fully met so that the applicant can receive the audit certificate. In the evaluation of educational qualifications, having one of statistics, industrial engineering, economics, computer science and management degrees has more points.

Table. Criteria for Quality Auditor role

title	Description	Score
Field of Study	Statistics, economics, industrial engineering, management, computer science	10
	other fields	5
degree of education	Bachelor's, Master's, Ph.D.	20,30,40
Work experience in the statistics unit	1-5 years, 5-10 years, 10-15 years, 15-20 years, 20 years and above	Year 1 point
Training hours	Related specialized training	Half a point for every hour of training
Quality related courses	Internal courses	Each period 5
	Foreign courses	10 each course

Based on the legibility criteria there are three levels of qualifications and the promotion criteria.

Table. levels and eligibility criteria for

Level	Educational Level	Least Score	Min Age	Years of Experience statistics	Course in official statistics	Other criteria
1	least a master's degree	80	40	10	least 60 hours	2years of experience at level 2
2	least a master's degree	60	35	8	least 50 hours	2years stop at level 3
3	least a bachelor's degree	40	30	6	least 40 hours	Passing the initial interview

There are some notifications for requesting and submitting the documents, for example:

- Note 1: The time for reviewing the documents and documents of the applicants to receive the quality audit certificate of official statistics is a maximum of 6 months after sending the documents to the quality technical committee, and the experience and work history of the applicants must meet the quota set in the special conditions before sending the documents to the technical committee. has arrived
- Note 2: The maximum audit capacity for level 1 auditors is 3 organizations, level 2 is 4 and level 3 is 5 organizations per year, which can be increased or decreased by up to 20% with the approval of the technical committee.
- Note 3: The validity period of the official statistics quality audit certificate for all three levels is two years from the date of issuance, and the auditors are required to apply to the technical committee for the extension or upgrade of their certificate by submitting a request and new documents.

4.3. Required training classes

Research Institute of Statistics is the main educational center in the field of official statistics, which offers a variety of specialized training courses for applicants every year. Applicants to receive an audit badge from the Iranian Statistics Center must complete the relevant courses according to the type of certificate requested and submit their application to the technical committee by presenting the course completion certificate along with other documents. The most important and necessary training courses to receive a quality audit certificate include:

Table. some of technical official statistics course for quality auditors

- modernization of official statistics, statistical standards, definitions and terminology
- Getting to know the NQAF national quality assurance framework
- Basics and advanced in official statistics
- running the surveys, basics, intermediate and advance level
- register-based statistics, data flow in the governmental and private sectors
- Special quality audit of official statistics, fundamental of official statistics and quality assurance framework
- statistical methodology and basics methods for data collection
- Familiarity with the country's statistical system and modernization of the statistical system
- data visualization, data analysis and reporting methods and
- workflow process of producing official statistics based on the general GSBPM statistical business model
- data and metadata production system and official statistics production processes
- statistical concepts such as regression, time series, etc.

4.4. Duties and responsibilities of the auditor

There are wide range of responsibilities that an auditor is suppose to cover and support. In the classification there are some common and technical responsibilities for quality auditor. The overall duty of the quality auditor should be structured on the recent production process of official statistics and any kind of duty assess the whole process of GSBPM [3].

Table. Important responsibilities of Statistical quality Auditor

Auditor's general duties
Accompanying the technical committee to hold the initial meeting to review the quality certificate request Preparing or revising the audit checklist in accordance with the necessary measures to obtain a "quality certificate" Compliance with the audit schedule during the audit process Record the audit evidence in the audit checklist Preparing final audit results and summarizing audit findings Communicating with the quality representative or management representative of the applicant organization during the audit process Registration of audit non-conformities and coordination to follow up the audit Coordinating with the technical committee team to prepare the audit report Holding the closing meeting of the audit Submitting the audit report to the technical committee Maintaining information and documentation of audit results and evidence of its implementation Follow-up of audit non-conformities
Auditor's Technical responsibilities
Examining the documents according to the regulations and instructions approved by the quality council to receive or renew the certificate of the desired level. Checking the self-assessment Excel file sent by the applicant organization Examining the process of forming a specialized working group on the quality of official statistics of the applicant organization Checking the appropriate identification of the beneficiaries of the applicant organization Examining the process of answering users' questions by the applicant organization Checking the metadata related to the statistics and statistical products prepared by the applicant organization Checking the publication calendar prepared by the applicant organization Examining the process of publishing statistics and statistical products with an efficient format for users to use by the applicant organization Examining the process of standardizing the definitions of official statistics requested by the applicant organization Examining the guidelines and guidelines developed to maintain statistical confidentiality in the publishing process by the applicant organization Advice and training to the applicant institutions regarding processes and standardization of processes and products

GSBPM is a standard to describe statistical processes in a statistical organization using a common language, it is a mean to describe statistics production, within and between statistical organizations, Common basis to work etc. that in the quality assessment is the frame to cover whole statistical components of the producers either NSO or other administrative sectors.

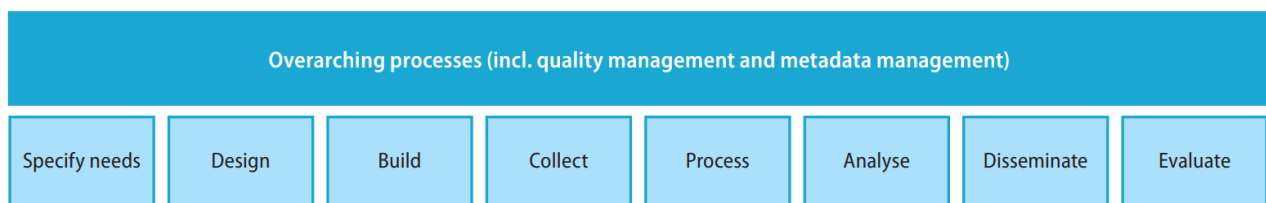


Fig. Generic Statistical Business Process Model
 statistical production process and quality management

In order to examine the role of the quality auditor and also to examine its relationship with other departments and people in the process of evaluating and issuing quality certification, the workflow process diagram will be as follows.

There is a process for issuing the certificate for both quality auditor and administrative organization that should be planned, implement by the quality committees and secretary at the NSO as a focal point for quality assurance area.

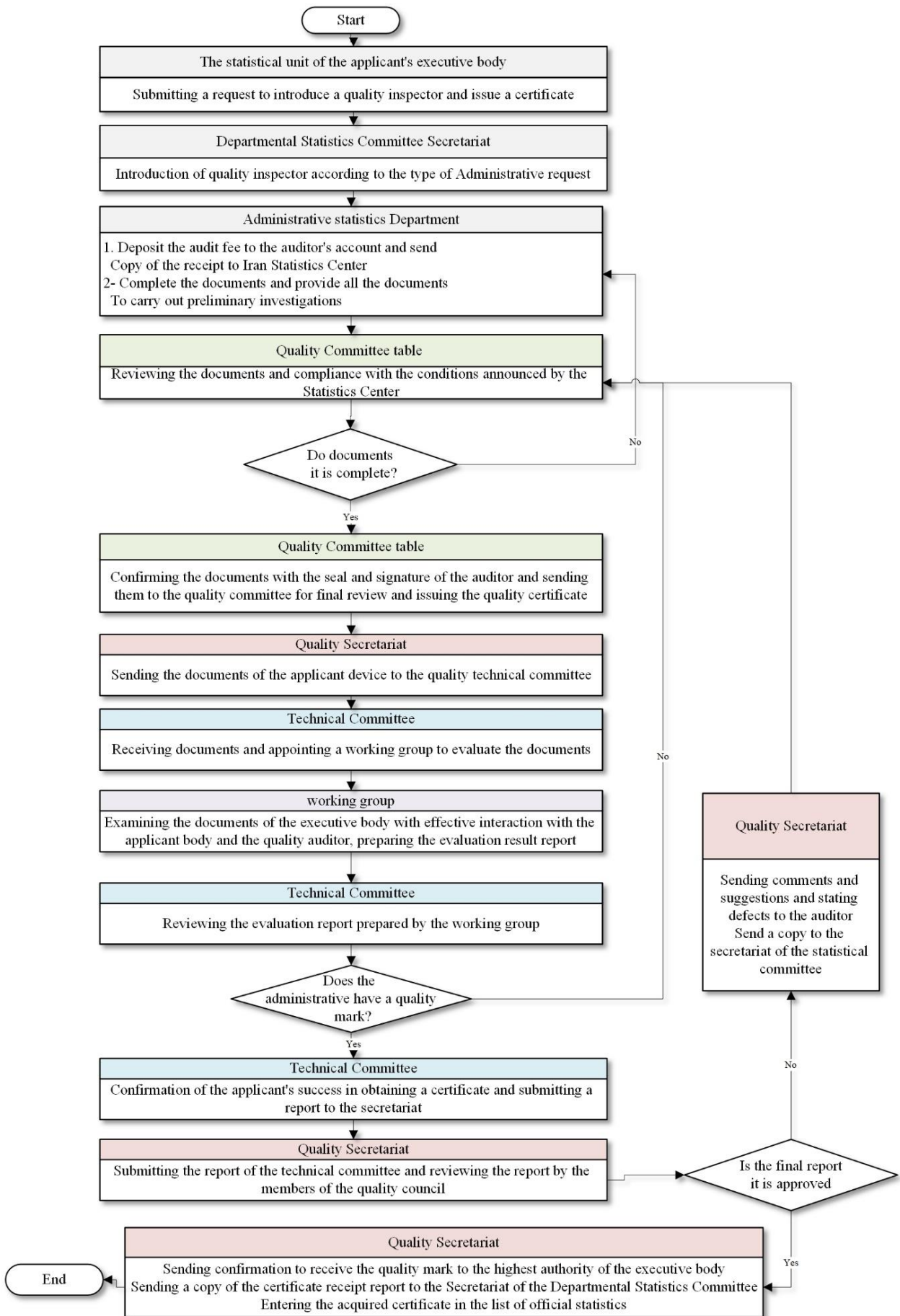


Fig. the process of issuing the quality mark for official statistics

4.5. Dealing with executive violations of the auditor:

The board for dealing with executive violations of auditors is a technical committee to deal with complaints and violations. Based on the submitted violations report, this committee can make an opinion and finally issue the appropriate vote, and if the decision cannot be appealed, it is final and valid from the date of notification.

Any violation of administrative rules and regulations by the applicant or auditor is considered a violation, and each of the parties can submit their protest and request to the technical committee in writing.

Note 1: The maximum time for handling the request for investigation of violations in the process of receiving the quality certificate is 2 months after the date of submission.

Note 2: If after examining the request of the executive body regarding the violation of the auditor, this matter is determined for the technical committee based on the documents, the committee can suspend the auditor's certificate according to the type and amount of the violation and prevent the auditor from continuing his activities.

Note 3: The quality technical committee is obliged to check the disputes based on the rules of violations and coordinate with the units and take the necessary decision according to the type of disputes and taking into account the administrative rights of the parties.

5. Conclusion:

In the decentralized statistical systems of countries, official statistics are produced by a variety of organizations including central bureaus of statistics, regulatory health care agencies, educational systems, and national banks, and Iran is following this structure. A common trend is the integration of official statistics and organizational data to derive insights at local and global levels. In the decentralized and semi decentralized statistical systems, each of statistical departments at administrative bodies are responsible for production of official statistics and these statistics should meet the quality assurance criteria to be officially published. In this paper a new role for statistician and quality experts has been presented that these people are representative of national statistical offices for quality assessment and reporting based of quality assurance frameworks and official statistics production processes, international standards, classifications, definitions and most importantly the users and stakeholders' need.

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