Impact of the Application of Total Quality Standards on the Development of Official Statistics'

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Abstract

This paper aims to improving the quality of statistical products in Egypt through examining the impact of applying the total quality standards on migration and mobility surveys, as one of the most important surveys carried out by statistical agencies worldwide. The study uses descriptive analytical method, and Statistical methods to evaluation of the statistical status of Egypt, based on the European code of best practices, and Generic Statistical Business Process Model (GSBPM), in addition to the SWOT analysis, Statistical methods were used to identify the correlation between the various variables, the study showed that the standard (accuracy) is the most affect by 38% correlated with the other quality standards; then the (availability) is 21%; that both the standard (accuracy) and (availability) affect 59% on the quality of the output of the statistical survey, It was also found that 99% of the sample frame design affects the quality of the statistical product, 61% of the response rates are due to the accuracy and clarity of the statistical form used in the data collection form, only 7% of the researcher's training on the data collection form affects the fieldwork method, it was found that 55% of the analysis of the survey results is due to the accuracy of published data. Finally the study recommends the need to improve quality reporting through the use of measurable quality dimensions based on the GSBPM.

Keywords: International Migration Survey, Quality Management, Code of Practice; Official Statistics.

1. Introduction

The world has recently witnessed a great interest in applying total quality in all fields; It has achieved unprecedented successes in many international organizations; So, The main goal of statistical agencies and organizations at the national and international levels is to provide the necessary information to inform the public and policy makers about the performance of the government and society, In order to fulfil this role, it is important that statistical products achieve a high degree of data quality, Good statistics are the basic foundation for assessing the current situation in society. Therefore, sound decisions are made.

The quality of statistical data is defined as the degree of accuracy of the statistics produced, and their ability to reflect actual reality without bias, in addition to its accessibility, timeliness, interpretability, and consistency with data and statistics issued by more than one source.

The "International Migration" survey is one of the most important and difficult field surveys conducted by statistical agencies around the world; The survey provides a large amount of data that reflects a true picture of the interrelationships between international migration, and development through important indicators extracted from its results, The most important of which are: identifying current, returning migrants, non-immigrants, and forced migrants.

2. The problem of the study and its importance

Despite the achievements achieved by quality in various industrial and service fields; however, we did not find a distinguished place for it in the statistical field, as quality experts emphasize that what cannot be measured cannot be improved. Therefore, it was necessary to know the standards upon which the quality of statistical data is measured. Hence, the problem of the study is to shed light on the extent to which the Egyptian Statistical office applies Total Quality Standards to its statistical products, and what are the factors affecting the quality of field work, and to which quality standards are used in the outputs of the "International Migration" survey.

Egypt launched the first national survey of international migration in 2013, and preparations are currently underway for the second national survey of international migration, which is scheduled to be held in 2024. Therefore, the importance of this paper is to identify the extent to which the Egyptian Statistical office applies Total quality standards to the quality of its statistical products, while setting the scientific rules and foundations for applying those standards to the International Migration Survey in its second edition.

3. Objectives of the Study

This paper aims to improve the quality of statistical products in Egypt by studying the impact of applying the total quality standards on field surveys. Focusing on International Migration Survey, as it is one of the most important and difficult field surveys conducted by statistical agencies around the world, while setting scientific rules and foundations that can be circulated to all field surveys.

4. Hypotheses

4.1 The Main hypothesis:

There were significant correlation relationship between application of TQM standards on statistical data and their impact on statistical products.

4.2 The Sub-hypotheses:

There are statistically significant correlation between:

- Sample design used in the field work and improving the quality of the statistical product.
- Accuracy and clarity of the statistical questionnaire used to collect data and the response rates for the survey sample.
- Training of researchers on the data collection form and the field work method.
- Study and analysis of survey results and the accuracy of published data.

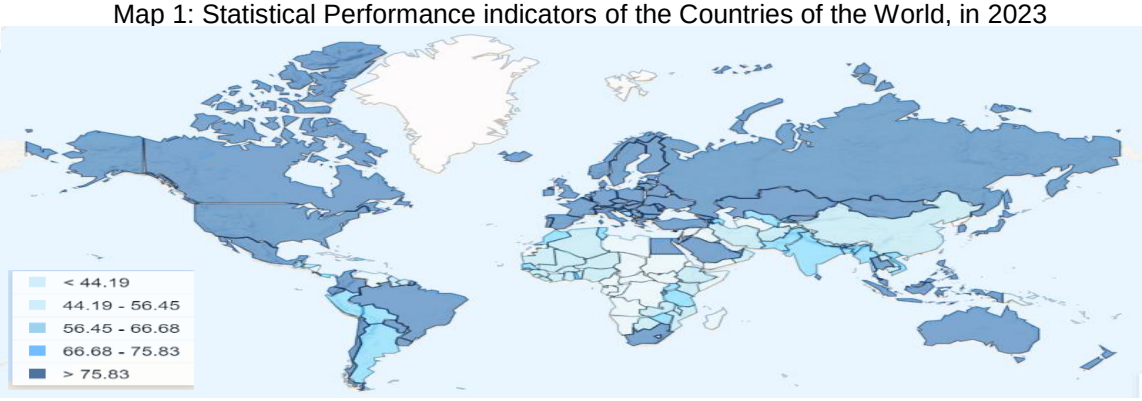
5. Methods

The study used the descriptive analytical approach and statistical methods to evaluate Egypt's statistical situation, using the statistical performance indicator as a good means to compare the performance of the Egyptian statistical office with Arab, African and international countries in accordance with international standards, the study also relied mainly on the European Code of Best Practices and the General Statistical Business Process Model, In addition to SWOT analysis, the study also relied on the quantitative statistical approach in analyzing the data collected from the field study sample, using factor analysis methods, and nonparametric tests to determine the correlations between the various variables under study using the statistical program SPSS.

5.1. International Assessment of the current situation of the statistical system

The World Bank launched the world Statistical performance indicators (SPI) in 2016 as a composite indicator that measures the quality of the country's statistical system across 186 countries around the world. It is based on five main pillars: data use, data services, data products, data sources, and data infrastructure. This indicator aims to measure the quality of statistical systems in collecting, producing and publishing high-quality data in a way that is accessible to all, The following of Map No.(1) show that Statistical Performance Indicators (SPI) for countries of the world in 2023 .

Map 1: Statistical Performance indicators of the Countries of the World, in 2023



Source: https://data.worldbank.org/indicator/IQ.SPI.OVRL?locations=1W&type=shaded&view=map

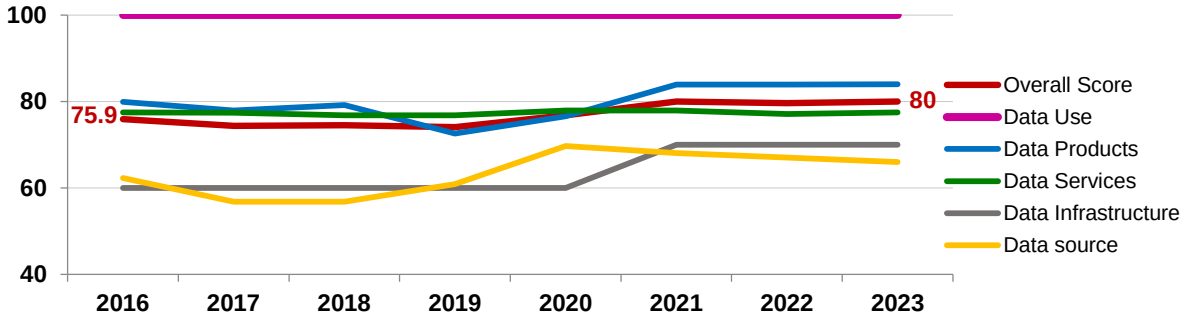
The previous map indicates that there are noticeable differences between the countries of the world in the statistical performance indicators, and we note that both of Europe and North America lead the index, as Finland ranked first in the world with a score of 93.6 out of 100, Norway followed in second rank with a score of 93.5, Canada in third rank with a score of 92.9 in the Statistical Performance indicator in 2023. At the level of the Arab region, we note that the West Bank and Gaza ranked first with a score of 83.4, and South Africa ranked first in Africa region with a score of 82.4.

Regarding the current situation in Egypt, it ranked second in Africa region, third rank in the Arab world, and 61st globally, with a score of 80 out of 100.

5.2 The current situation of the statistical performance indicator in Egypt

Within the framework of the efforts exerted in Egypt to develop the quality of statistical products, Figure No. (1) shows the development of statistical performance in Egypt.

Figure 1: Overall Score of Statistical Performance indicators (SPI) in Egypt (2016-2023)



Source: https://data.worldbank.org/indicator/IQ.SPI.OVRL?intcid=ecr_hp_BeltC_en_ext&locations=EG

Figure (1) indicates that there is an improvement in the general indicator of statistical performance in Egypt during recent years, as we note that the pillar of data use is higher than the other pillars. This is due to the fact the national statistical system meets the data needs of a large group of users, whether from the legislative and executive authorities, civil society and academia, followed by the data products pillar, which depends on providing the basic data required to support the SDGs2030, followed by the data services pillar, which refers to the statistical system's ability to produce indicators related to SDGs 2030, followed by the data infrastructure pillar, which refers to the statistical system's application of laws and institutional frameworks and following internationally recognized standards, methods and concepts; While we notice a decline in the pillar of data sources, which refers to various of data sources, including censuses, surveys, administrative data, geospatial data, open data.

5.3 The current situation in Egypt regarding the implementation of the European Code of Best Practices

The European Statistics Office (Eurostat) has developed a questionnaire (self-evaluation) on the extent to which surveys are consistent with the principles of statistical work in the European Community, which is known as the "European Code of Best Practices in Statistics for Statistical Offices". The questionnaire is divided into three parts: Institutional environment, statistical procedures, and outputs of statistical work.[1]

[1] European Commission,"European Statistics Code of Practice (Self Assessment Questionnaire)", 2012.

Regarding the current situation in Egypt, the Egyptian Statistical Office applies all standards for the institutional environment and statistical procedures in terms of the existence of a law to protect professional independence. It is responsible for collecting and publishing statistical data independently and in coordination with ministries and data-producing bodies, and it adheres to all quality standards for statistical outputs from It achieves a high degree of accuracy and quality for all its statistical data

5.4 Evaluation of Experts and Citizens on the Quality of Statistical Data in Egypt

According to study conducted by Decision Support Center of the Egyptian Council of Ministers on the extent of citizens, Its goal to identify the opinions of both experts and Citizens about the quality of official statistics, the following became clear:

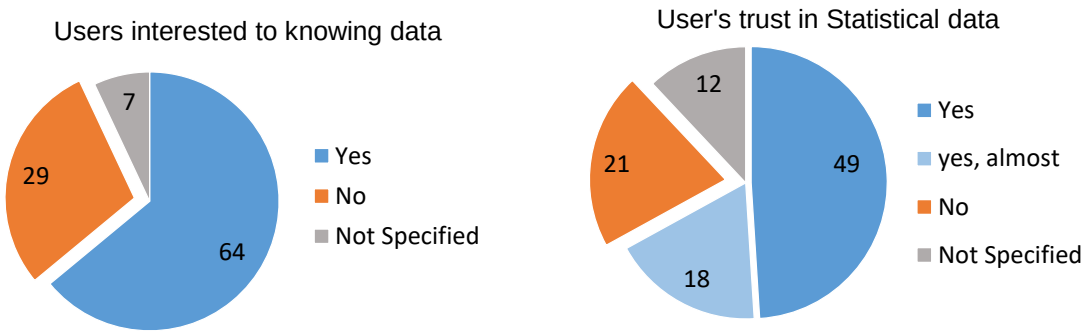
5.4.1 Evaluation (of Experts) on the Quality of Statistical Data in Egypt

Experts pointed out that the statistics in Egypt suffers from some shortcomings, among them: conflicted data that are not reflected by the actual fact, there is a time gap between data collection and its dissemination, the reduced demand for data, and the difficulty in the availability of raw data.

5.4.2 Evaluation (of Citizens) on the Quality of Statistical Data in Egypt

Figure No. (2) indicates the extent of respondents' interest in knowing published official data and statistics. It is clear that 64% of citizens are interested in knowing the data and statistics issued by the government; regarding the extent of the respondents' confidence in knowing the official data and statistics issued by the government; it became clear that only 49% of citizens trust the data and statistics issued by the government. The reason for this may be due to the citizens not feeling the fruits of the positive changes in most statistics and their lack of reflection on living standards.[2]

Figure 2. Evaluation of Citizens on the Quality of Statistical Data in Egypt



Source: Information and Decision Support Center of the Egyptian Cabinet.

[2] An opinion poll on the extent of citizens' interest in knowing government statistics and the extent of their trust in them, was conducted on a stratified sample 1,403 individuals, Data was collected via telephone calls.

5.5. Analysis of the current situation of field Surveys in Egypt

It is clear from the study that the evaluation of quality management varies from a country to another, which calls for an assessment of the current situation using a SWOT analysis to determine the most important strengths, weaknesses, opportunities, and challenges that the statistical office faces in applying Total quality to field surveys.

Table 1: SWOT analysis for International Migration survey

Strengths	Weaknesses
- Create social media sites to communicate with data users - Use laptops in the data collection phase. - Use a call back system to verify the accuracy and logic of data from the field - Reducing the number of visits to the family under investigation to reduce the burden on them - Egyptian statistical office follows the professional principles and recommended by international organizations. - Creating good friendly relations between data collectors and respondents to reduce the burden of non-response. - Ease of obtaining statistical data through various regular and electronic publishing means, and with fairness among all data users. - Developing the human capabilities of workers.	- Citizens' weak statistical awareness and their lack of awareness of the importance of statistics - Lack of clarity among employees' concepts between the quality of the statistical product and total quality management - The lack of clear coordination mechanisms between the agency and the agencies and ministries that produce statistical data - Weak work participation between senior management and field workers.
Opportunities	**Threats**
- Citizens' confidence in data and statistics issued by government agencies and institutions - Creating unified databases at the level of the agency, ministries and government agencies, to eliminate data conflicts. - Using the media to alert citizens to the necessity of providing statements - Coordination with international organizations in preparing the national strategy for developing the national statistical system - The importance of survey data for various scientific purposes and uses that benefit a large base of its users.	- Decrease in policy makers' demand for statistical data - There is no law for the exchange of information in Egypt - Poor quality of the framework used in surveys, which needs to be audited and updated from time to time - The necessity of appointing researchers on professional grounds that are compatible with their qualifications and their personality in dealing with different segments of society. - The limited availability of transportation to transport researchers to field work.

5.6. The relationship between applying Total quality standards to field surveys

The researcher designed a questionnaire that includes a set of questions that help reveal the extent to which total quality management is applied to field surveys, focusing on the international migration survey, in addition to the researcher's personal observations through her work in the field of statistical work, Below is a summary of the most important results.

6. Results

6.1 The relationship between applying TQM standards to statistical data

The relationship between applying Total Quality Management standards (Relevance, Accuracy, Timeliness, Accessibility, Comparability, Consistency, Integration) (independent variable) and its impact on the outputs of the statistical product (dependent variable) was studied using factor analysis.

Extraction Method: Principal Component Analysis.

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.663	39.830	39.830	2.663	39.830	39.830
2	1.462	22.490	62.320	1.462	22.490	62.420
3	.908	10.978	73.298			
4	.695	9.925	83.223			
5	.532	7.596	90.819			
6	.408	5.823	96.642			
7	.332	3.358	100.000			

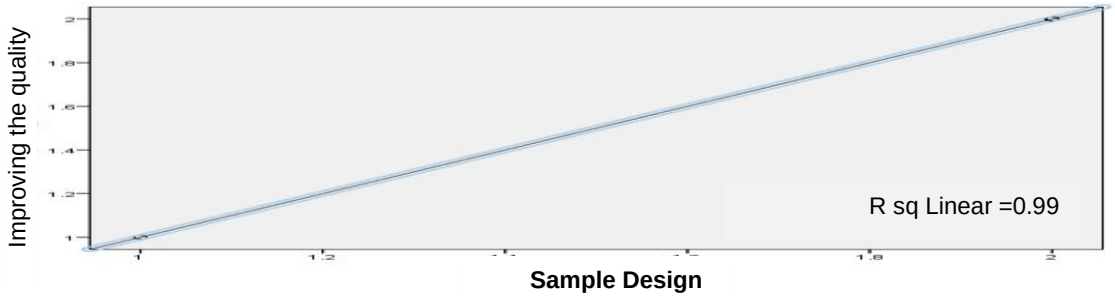
Component Matrix

	Component	
	1	2
Relevance	.496	.544
Accuracy	.810	.320
Timeliness	.620	-0.75
Availability	.368	.804
Consistency	.769	.458
Comparison	.643	-0.17
Integration	.484	.759

The study showed that the first factor (accuracy) is the strongest of 40% correlated with the other seven quality standards, the second factor is (availability) of 22%, meaning that both of (accuracy) and (availability) affect by 62% on the quality of statistical product.

6.2 The relationship between used Sample design and the quality of statistical product

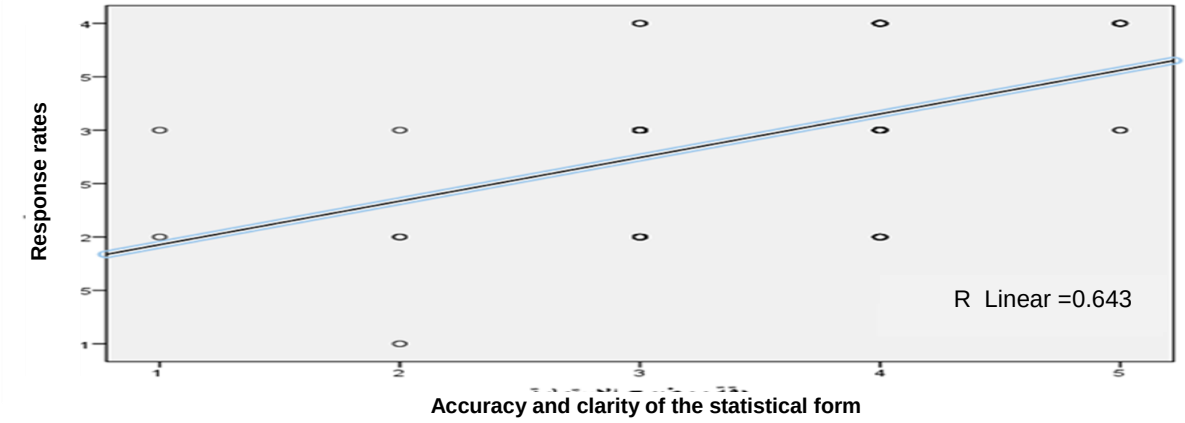
The relationship between Sample design in the field work (independent variable) and the improving the quality of statistical product (dependent variable), using the Scatter diagram.



The study showed that a strong and complete correlation of 99% of sample design used in the field work effects on the quality of statistical products.

6.3 The relationship between accuracy and clarity of the statistical form in data collection

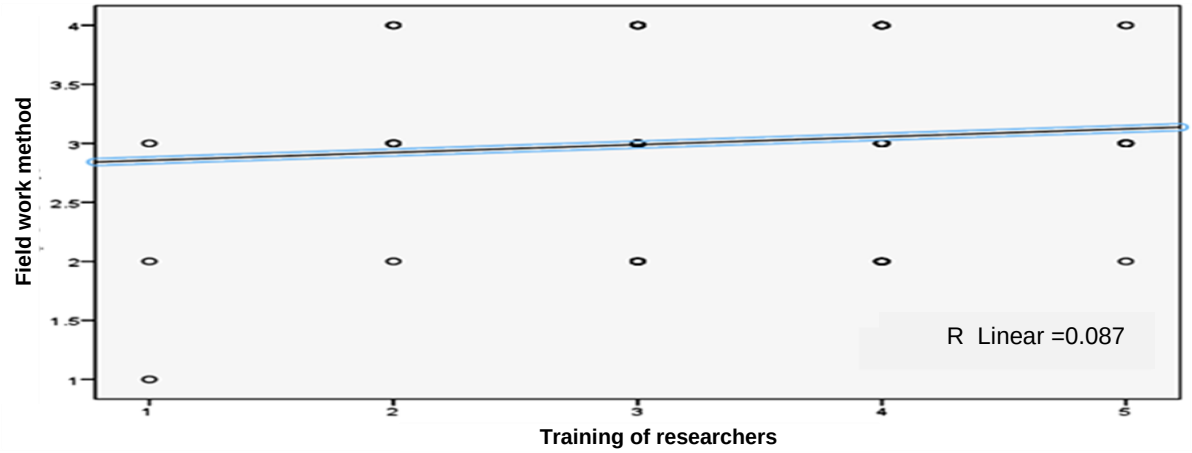
The relationship between accuracy and clarity of the statistical form used in data collection (independent variable) and the response rates for the survey sample (dependent variable), by using the gamma correlation coefficient of 0.643 and the significance level of 0.000 which is less than 0.05.



The study showed that 64% of accuracy and clarity of the statistical form effect on the response rates for the survey sample.

6.4 The relationship between Training of researchers and the Field work

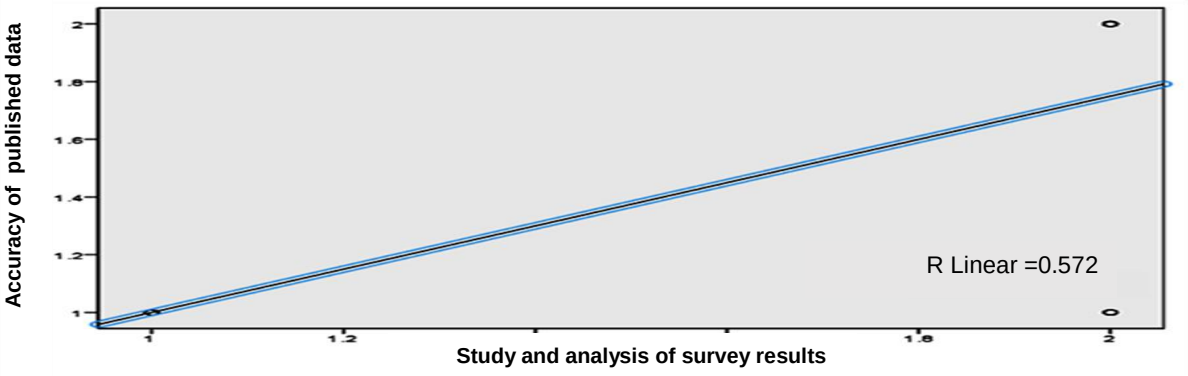
The relationship between Training of researchers on the data collection form (independent variable) and the field work method (dependent variable), by using correlation coefficient.



The study showed that 9% training of researchers on the data collection form effect on the field work method.

6.5 The relationship between analysis of survey and the accuracy of published data

The relationship between the analysis of survey results (independent variable) & the accuracy of published data (dependent variable), by using the correlation coefficient Spearman.



The study showed that the study and analysis of the survey results effects 57% on the accuracy of published data.

7. Conclusions

There is a necessary for:

- Train the field researcher on the use of technology, "laptop, tablet" to collect of data from the field, to reduce the time of data collection.
- Update legislation and laws related to data collection and updating it according to the current circumstances of the country.
- Good marketing of statistical products to be published in an attractive, clear and understandable way to everyone.
- Develop and update the framework used in field surveys.
- A channel to communicate with users of statistics, to get their views and needs in statistical data.

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