

Statistics Norway
Department of Management Support

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Documents

**Systematic Quality Work in
Official Statistics -
Theory and Practice**

European Conference on Quality in Survey Statistics
(Q2006), Cardiff, 24 - 26 April 2006

1. Introduction

During the last decade, National Statistical Institutes (NSIs) worldwide have focused upon the importance of quality work. A systematic approach to quality has been adopted in many institutes. This has been based on some basic principles of quality management. In particular, the framework of Total Quality Management (TQM) has been important, but also models that emphasise the link between strategy and quality such as the European Foundation for Quality Management (EFQM) and Balanced Scorecard (BSC) have been introduced in several NSIs.

Since models vary between institutions, and to some extent also over time (some times models change but the main content prevails), Statistics Norway and several other NSIs have adopted the neutral concept "systematic quality work". This will be used in the paper denoting the core content of the different quality management models.

On the European level, one important step was the formation of the Leadership Expert Group (LEG) on Quality in Eurostat in 1999. This group came up with a list of recommendations that has been followed up within the European Statistical System (ESS). International organisations have formulated quality principles and frameworks for statistics, including traditional values of official statistics such as those formulated in the United Nations (UN) Fundamental Principles of Official Statistics. Eurostat has recently developed a Code of Practice for the production and dissemination of statistics (Eurostat 2005). Eurostat recommends that all statistical authorities adopt this or a similar code.

It has been relatively easy for most NSIs to agree on basic quality principles and frameworks, and also to a large extent to follow general principles such as independence and integrity in the production of statistics. However, the practical implementation of a systematic quality work and quality management to improve all products and processes, is a greater challenge. This paper deals with the difference between theory and practice in this area. It is naturally based on experiences from the authors' own country, but also on experiences from international cooperation (such as in Eurostat) and statistical advising in countries outside Europe.

The paper includes a brief recapitulation of the basic quality principles adopted by most NSIs. The most common measures that have been implemented to follow these principles are reviewed. The results of systematic quality work are difficult to measure. This might be looked upon as a contradiction since one of the basic principles is measuring for monitoring and improvement. Nevertheless, some practical results are considered, and some shortcomings and challenges are identified. Some measures to narrowing the gap between theory and practice are proposed.

2. Principles for systematic quality work

Systematic quality work is characterized by the following principles:

- User orientation: User needs is the point of departure for defining quality in statistics
- Process orientation: Improvements require control of and changes in processes
- Documentation and data: Changes must be based on data about processes
- Participation by all: Project- and teamwork is important
- Management and continuity

Documentation of user needs, products and processes is a requirement for assuring and improving quality.

Figure 1 shows a model for the link between users, products, processes and conditions that are preconditions for the processes and work in a NSI. In the new European Code of Practice the preconditions correspond to "Institutional Environment". The figure is based on a figure presented at Q2001, see Sæbø, Byfuglien and Johannessen (2003). The headings used in the Code of Practice are given as bullet points in the figure.

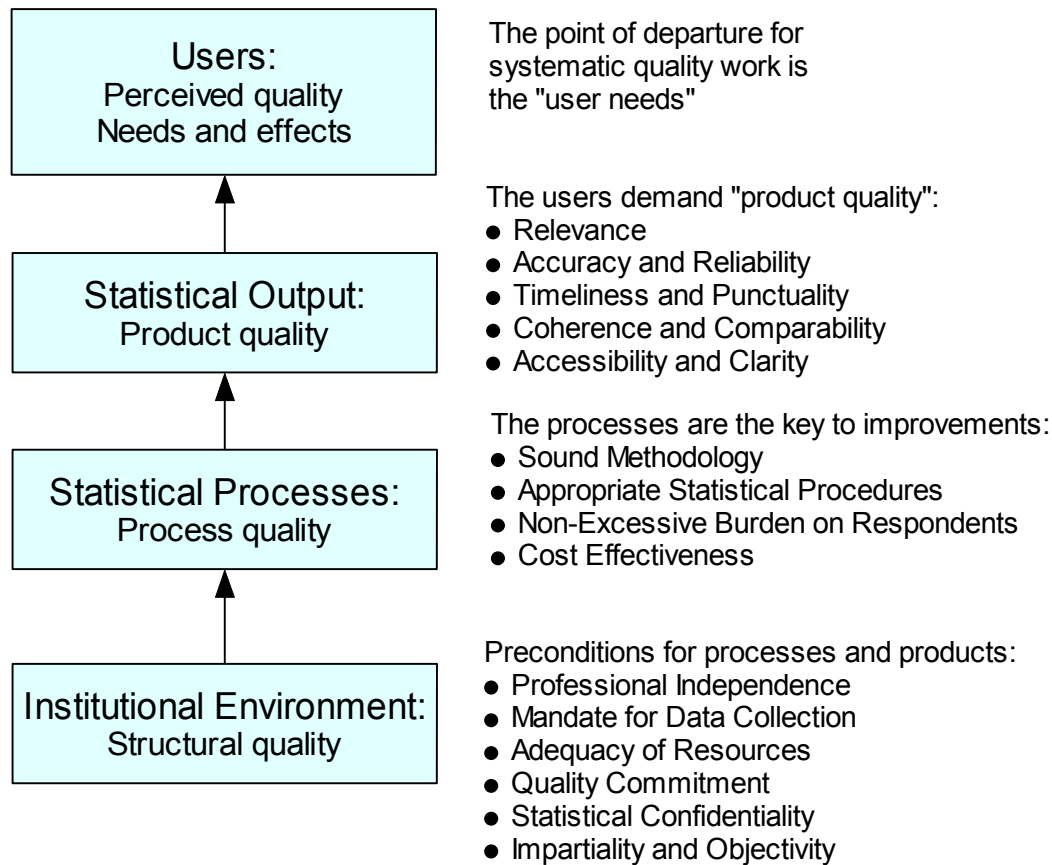
The dimensions of product quality for statistics are often described according to Eurostat (2003), and constitute the part of the European Statistics Code of Practice linked to the statistical output

Costs are linked to the processes, and must always be taken into account when considering quality. There is a balance between product quality and costs. The response burden is also an issue since it is important for the data providers, who could be regarded as users in this context. It also contributes to the costs of statistics for society.

Systematic quality work comprises tools, methods and techniques for the creation of ideas, and documentation and measuring user satisfaction and needs, product quality and processes. Statistical methods are used for controlling variation and distinguish natural variation from trends and special causes.

Focus is often on improvements based on the study of key process variables, which are factors linked to the processes with great impact on product quality. This procedure of improving processes is described in various papers, such as in the "classical" paper on quality management in NSIs by Morganstein and Marker (1997) and in Aitken, Hörngren, Jones, Lewis and Zilhão (2003). Project- and teamwork is central to ensure the participation of all and a variety of ideas and views.

Figure 1. Model for Total Quality and Code of Practice



3. Measures and results of systematic quality work

3.1 The European Statistical System (ESS)

The Eurostat Leadership Expert Group (LEG) on Quality worked out a series of recommendations for quality work in the European Statistical System (Eurostat 2002). The measures proposed can broadly be divided into recommendations to the NSIs and/or to Eurostat, documentation of good practices in handbooks and central (European) measures such as establishing regular conferences on quality in official statistics (the Q-series!).

The NSIs were recommended to implement systematic quality work, to measure and report product quality, developing user-producer dialogue (including service levels agreements, good information practices and documentation), Current Best Methods (CBMs), staff perception studies and training in quality work. Handbooks have been written on key process variables (Aitken, Hörngren, Jones, Lewis and Zilhão 2003), customer satisfaction surveys (Cassel, Järnbert, Holzer, Barbieri and Tiddi 2003) and auditing (state-of-the-art, Zilhão, Santos, Davies,

Howell and Booleman 2003). In addition, a checklist for self-assessments for survey managers (Körner and Nimmergut 2003) and a report on methods for assessing perceived response burden (Hedlin, Dale, Gustavsen and Jones 2005) have been developed

The recommendations have been followed up by annual questionnaires to the NSIs for the years 2002 - 2004 (15 member states + 3 EFTA countries + 10 new member states in 2004). It turns out that by 2004, most of the recommendations were fully or partly met. Exceptions were the recommendations on adopting a quality framework/system, on development of service level agreements and on CBMs for the most common processes.

The recommendation on quality frameworks focused on EFQM. With a more open definition of systematic quality, answers would probably have been more positive. Nevertheless, more than half of the countries claimed to have used the EFQM model or a similar model, or that they were going to start using the model during 2005.

In 2005, the European NSIs filled out a comprehensive questionnaire to follow up the Code of Practice. Here the question on quality systems, such as TQM or EFQM, was repeated. Most of the NSIs said they had introduced or were in the process of introducing a quality system. However, more detailed questions such as questions on existence of processes to monitor quality, revealed that such processes only existed to a small extent.

In total, the LEG and Code of Practice questionnaires indicate progress in quality work in the European NSIs over the last 5 years. However, since this is built on self-assessments, there might be a difference in practice, in particular when questions are general.

The area of documentation or metadata can illustrate this difference. In the Eurostat questionnaires in 2004, 75 percent of the NSIs in Europe claimed that they had systematic documentation schemes, and almost all the remaining NSIs foresaw implementation of such a scheme. Almost all of them said they had documentation for the users of statistics on Internet. However, when Sæbø (2004) checked the availability of metadata on the web sites of about 20 NSIs (most of them in Europe), only a few had easily available systematic information on the statistics' production methods, definitions of concepts and standards, and quality information such as information on errors and accuracy, comparability and coherence. In a web site check conducted by Eurostat prior to the Metadata Working Group meeting in June 2005, still less than half of the 25 EU member states had medium or large amount of standard metadata available on the Internet, and only a few of them according to some systematic scheme or template following each statistics (Pellergrino and Sankiewicz 2005).

This reveals a difference between the results of self-assessments and objective evaluations; an example of a possible gap between theory and practice. However, there is no doubt that there have been quality improvements in European statistics during the last few years, due to the attention systematic quality work has obtained and Eurostat efforts such as recommendations, documentation requirements (such as quality reports) and follow-up questionnaires. The Q-conferences that have become very popular are another indication of this.

3.2 Statistics Norway

In Statistics Norway, systematic quality work was initiated in 2000. Important measures have been:

- Information and training
- Management by performance indicators
- User surveys and service declaration
- Project and teamwork
- “Current best methods” (CBMs) and good practices (i.e. handbooks)
- Staff surveys
- Work on documentation and metadata in general
- International cooperation and advisory

Sæbø, Byfuglien and Johannessen (2003) describe the quality work carried out in Statistics Norway during the first few years with a systematic approach, with emphasis on user orientation, performance indicators, research as quality control and training. An example of a systematic approach to quality assurance in the work on the consumer price index is also discussed.

Information and training have been central measures. Statistics Norway has educated so called “quality pilots” in three rounds. We now have about 30 active pilots who participate in projects as advisors and coaches in quality and process work. Quality work has been included in other training schemes such as training for all new employees and a course in project and teamwork. All together about 200 new employees and 100 participants in a course for project- and teamwork have during the last 5 years been introduced to systematic quality work.

Measuring the effect of a quality scheme is always difficult, since we never know what would be done without a systematic approach. However, there is no doubt that this has contributed to better user orientation and a more effective statistics production in Statistics Norway.

User orientation is in particular visible through the development of ssb.no. In earlier days, Statistics Norway’s main products were publications designed to satisfy the needs of users within planning and research in particular. But during the last 10 years we have gradually changed our dissemination policy towards meeting the needs of the broader public, as well as targeting more specialised users. This change has been facilitated by the development of new technology, in particular the Internet. Today all official Norwegian statistics are disseminated for free by the Internet, and it is an objective to reach the general public directly or via different public media. For this purpose we have actively recruited journalists to work within Statistics Norway.

Productivity estimates indicate an increase in productivity of almost 2 per cent annually, and the statistical products are often extended without any increase in resources used. And in general, the quality of the products, measured as relevance, timeliness and accessibility, is improving (measured by the performance indicators).

Quality thinking has been central in several large development projects, and several existing statistics have been evaluated and improved in projects in particular aiming at this.

However, the improvement projects have with some exceptions not been selected systematically, for example by size. Projects linked to training schemes have been backed by quality pilots and coaching through systematic follow up in accordance with our project handbook. For other projects and in daily routines this has been done only if the project manager or the management in general has asked for it. Systematic audits have not been carried out, except for external evaluation carried out by the International Monetary Fund (IMF) for parts of the economic statistics.

Quality work is central in our strategic plans. And product quality is monitored and followed up by the use of performance indicators. However, we have still not succeeded in the integration of systematic quality work in all planning and follow up routines. This is partly due to the lack of good and measurable indicators on a more detailed level than the level of our existing performance indicators.

One department in Statistics Norway (IT and data collection) has used the system of BSC in its own management. In this work systematic measurement of several new variables have started (examples are number and types of complaints, errors and several variables linked to perceived response burden in addition to the traditional time used for answering questionnaires). Management, who uses the results in follow-up of plans, facilitates this.

The theory of quality improvements by identifying and measuring key process variables is described in the several papers such as in Aitken, Hörngren, Jones, Lewis and Zilhão (2003). However, there is a common experience that there is a large difference between theory and practice in this field. This might be a problem of management who (with a few exceptions) does not demand figures, but also an indication that this is more difficult than what is taught in courses.

Another issue is how to ensure that descriptions of best methods or good practices are known, read and eventually used. Much too often one sees that important reports are made for just being archived. This may be the case both on the national and international level. For example, several good reports describing state of the art and good practices in quality management have been produced to follow up the Eurostat Quality LEG recommendations. However, despite some dissemination efforts from the LEG, these methods and tools often lack visibility within the statistical institutes of the ESS. In general, more attention should be paid on promoting the use of good practices.

To put more pressure on quality work and facilitate a more systematic approach to areas and measures of improvements in Statistics Norway, the central coordination of this work has been strengthened by the establishment of a new department that among other tasks will be responsible for this coordination (Department of Management Support). Facilitating the use of developed CBMs will also be the responsibility of the new department.

3.3 Developing countries

Several statistical institutes in developing countries have put quality work high on their agenda, inspired by the same thinking as in European statistical institutes, but also emphasised by IMF that has carried out evaluations in connection with the countries' statistics represented on the General Data Dissemination System (GDDS) web pages (<http://dsbb.imf.org/Applications/web/gdds/gddshome/>).

It should be easier to introduce quality assurance along with the development of new statistics. But this requires attention and support not only from the institutes' own management, but also from external advisers and donors who normally play an important role in this case.

Systematic quality work was introduced in the national institute of statistics in Mozambique in 2002, by a course for management in TQM, and a series of recommendations including the development of a quality plan and nomination and training of quality facilitators from all parts of the institution. A quality plan was developed including the following main items:

- Declaration(s) of quality
- Documentation and metadata
- Quality survey
- Performance indicators
- Quality education and training

A number of quality facilitators were nominated. However, when it came to training of these in 2004, the facilitators' team had been changed several times, often due to changes in their major tasks and new priorities. It has been difficult to involve the team in follow up of quality work. This reveals a general problem with people in particular assigned to quality coordination efforts: They often lack sufficient authority in the organisation. Top management is normally positive to quality schemes; other parts of management are often more concerned with daily operations and short-term objectives.

It is a paradox that quality efforts tend to lose out in the normal situation with scarce resources. There are many examples where developments of new systems and statistics have not been followed by satisfactorily documentation. Often documentation has been regarded as the last step in the development. This may cause severe problems if key persons leave during the development process. Too often one can observe that routines and large systems such as national accounts are "black boxes" without proper documentation. In particular this concerns systems developed by external advisers acting as "gap-fillers". Changes and improvements will then be extremely difficult at a later stage, and the very expensive alternative might be to develop completely new systems from scratch.

User dialogue is the key for taking user needs into account when producing statistics. However, in practice, it is not obvious that all users are taken into account. Statistical institutes are often oriented towards the needs of the authorities, which are planning and monitoring for major ministries such as the Ministry of Finance. This is partly due to the funding structure, but can also be seen as a consequence of the lack of registration and advocating of general user needs.

Often the institutes are rather production oriented as well, e.g. emphasis is put on the production of statistics and not on dissemination.

Setting priorities and balancing various quality aspects is an important part of quality work in all NSIs, but always difficult in practice. In general, strategies and plans are often too ambitious compared to available resources. Development projects are often highlighted, and there is a tendency towards easier funding opportunities for new projects than for improving the quality of existing statistics.

There is a classic conflict between timeliness and accuracy. A specific example from Mozambique is that production of quarterly national accounts to increase relevance and timeliness of short term statistics might be in conflict with accuracy and hence reliability of existing annual national accounts that more or less are competing for the same resources. One should be careful to propose extensions in statistics production before ensuring the quality of existing products. Increased response burden following new surveys also leads to increased society costs, and can harm the quality of existing and new statistics by increasing non-response and measurement errors.

4. Conclusions

4.1 Experiences

The difference between theory and practice when it comes to implementing systematic quality work in statistics, is an issue in all countries and international organisations. We have identified the gaps between theory and practice in the following areas:

- Self-assessments do not always tell the truth; what is said is often a bit optimistic.
- Systematic quality work is not always systematic enough.
- Identifying and measuring (key) process variables for monitoring, control and follow-up is difficult.
- Even if CBMs exist, they are not well known and even less followed.
- The quality organisation (coordinators and facilitators) often lacks sufficient authority.
- The needs of users that do not directly fund statistics (i.e. the general public) tend to be neglected.
- Development of new statistics is given priority on the costs of quality assurance and documentation.

Even if there are challenges, there is no doubt that the focus on quality in statistical institutions has given results. This concerns both user orientation exemplified by free access to statistics on Internet, improvements in product quality such as timeliness and improved effectiveness in statistics production.

4.2 The way forward

To narrow the gap between theory and practice in this field, measures should be directed towards the challenges mentioned above. Examples of measures are:

- Self-assessments should be followed by external reviews¹.
- The most important activities and projects should be given priority by quality facilitators.
- More pressure should be put on identifying and measuring key process variables for the most important activities and projects. Management on all levels should use these variables in planning and follow-up.
- Activities to promote and ensure the use of CBMs should be carried out.
- The quality organisation should be linked to top management and comprise persons on a sufficiently high organisational level.
- Attention should be given to all users. The issue of different user needs and the need to balance quality versus new developments should be discussed with authorities funding statistics.

Training, continuity and management are preconditions for all quality work and for the measures mentioned.

Quality has to be included in all training schemes. Systematic quality work is a continuous effort. To ensure this, one should concentrate on the core principles and avoid discussions on which "system" is the best (i.e. TQM, EFQM, BSC etc.).

However, the main key to success is management and leadership. Working with top management is necessary but not enough. Middle management is responsible for the daily operations, and hence the key to solve the conflict between these and investments in long term improvements.

An issue that is closely linked to management is that systematic quality work has to be integrated in existing strategies and planning routines at all levels. Strategies and planning should result in measurable objectives that have to be followed up. People tend to do what they are measured by!

Finally, there might be a risk that the difference between theory in the form of the visions and what is possible in practice harms the motivation. It is important to emphasise that such differences exist. Visions should be kept high. But the steps have to be small and concrete!

¹ This is the procedure in implementing the European Code of Practice for statistics: A self assessment questionnaire in 2005 is now followed by peer reviews.

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