

# **Using Total Quality Management to improve Spanish industrial statistics**

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## **Abstract**

The TQM approach used to produce industrial statistics in Spain is presented in this paper. The starting point is asking customers about our statistics products. Then, specific programs and actions are implemented trying to improve customer satisfaction. The following projects have been launched as a direct consequence of expressed customer needs: improving timeliness, improving a service of tailor-made information, and offering individual data tailored to the reporting enterprises as a “payment” for answering questionnaires.

**Keywords:** Total Quality Management, TQM, enterprise surveys

## **1. Introduction**

Nowadays, statistical offices are under continuous pressure from society, which demands more and more data, to be produced at a lower cost, with a lower respondent burden and with a shorter delay.

In this situation, methods and tools that could help to improve the efficiency of statistical production processes, and to fit better customers needs, are of the outmost importance.

Total Quality Management (TQM) is being used by many organisations all over the world, as a method to improve production systems and to produce high quality products.

At first, TQM was developed for private companies, but in many countries TQM thinking has also penetrated into the public sector.

As a matter of fact, several official statistical agencies are using TQM methods and strategies in some way.

This paper presents our experiences on using TQM to improve industrial statistics. A general description of the approach used is introduced. Then, some projects implemented as a consequence of using TQM are presented. First, the use of customer satisfaction surveys, which is the starting point of our TQM strategy. The projects on

improving timeliness, on improving a service of tailor-made information, and on offering individual data tailored to the reporting enterprises, are also presented.

## **2. TQM approach used for industrial statistics.**

Because there are many TQM definitions, it is relevant to describe the approach followed in the National Statistic Institute of Spain to produce industrial statistics.

The essential ideas of the TQM approach used are that the suppliers (the reporting units) and the customers (the data users) are part of the productive system, and they determine the definition of quality to be used by the organisation.

The basic principles followed are:

- a) Customer satisfaction: it is the corner stone of the TQM approach. A product has quality when it satisfies customers.
- b) Continuous improvement: TQM is not a short-term goal that finishes when a target has been met. It is a continuous improvement process, trying to adapt to the customers' changing needs.
- c) Fact-based management: Total quality can only be based on facts recognised by the whole organisation.
- d) People based management: it is people who achieve quality. Systems, standards and technology themselves are not enough to produce quality.

Trying to follow those essential ideas and basic principles, our approach for the Spanish industrial statistics is quite simple. The starting point is asking customers about our main failures. Then, specific projects and actions are launched to correct those failures and to improve customer satisfaction.

Based on our customers' opinions, we have learned that the main failures of our statistics were, in order of importance:

- The delay in data production
- The insufficiency of our standard publications for their needs
- The non-existence of procedures allowing to mix microdata from different surveys

The following projects have been launched as a direct consequence of using TQM approach:

- Improving timeliness
- Improving a service of tailor-made information

- Offering individual data tailored to the reporting enterprises as a “payment” for answering questionnaires.

### **3. Customer satisfaction surveys**

Customer satisfaction is the corner stone of TQM approach. A statistical product has high quality when it satisfies customers. Therefore, it is very important to evaluate customer needs and to know the customer views concerning our statistics.

The best way to learn about our customer views is asking them, by means of customer satisfaction surveys.

We carried out our first survey on customer satisfaction in 1991, and from then, we have carried out several surveys. Among them, the followings can be pointed out:

- A customer satisfaction survey on our paper publication. A one-page questionnaire was inserted in every copy of the annual survey book. The same questionnaire was also given to people consulting this book at the INE public library. The questionnaire topics were about the main strengths and weaknesses of the publication. The points learned from the survey were that the sector breakdown of the industry was acceptable and that the data included for each sector gave an adequate description of its structure. On the other hand, the geographical breakdown was considered insufficient. The lack of timeliness was the most frequently criticised failure.
- A customer satisfaction survey on our service of tailor-made information. Over one year, every response given to customers of tailor-made data was accompanied by a one-page questionnaire. The topics of the questionnaires were about the specific use of the data, and the strengths and weaknesses found in them. As a consequence of the survey, a detailed working document was prepared. The careful study of the document was the starting point of several improvement projects. Among them, the responses to the survey allowed us to know more about customer uses of our data. This knowledge enabled us to establish customer segmentation.
- A customer satisfaction survey on our service of tailor-made information for reporting enterprises. We offer to our reporting enterprises a free service of tailor-made information as a “payment” for their filling in questionnaires (this service is described with more detail in the following pages). A telephone survey of about 10% of the enterprises that make use of the service was carried out. The questions were about the usefulness of this service for the enterprises. From the point of view of reporting enterprises, our statistical information is not vital (i.e. enterprises do not consider they need this information to achieve their business objectives). On the other hand, they consider that the information is interesting and not irrelevant. The main use of the information is to evaluate their position in the market.

Furthermore, almost all the enterprises find entirely positive this project of INE of offering a free service in return for filling in questionnaires.

#### **4. Improving Timeliness**

An 80 % of the customers consider the delay our main failure. Therefore, our principle priority should be to improve timeliness.

To face the problem of timeliness, we have established the following strategic target: to produce the quickest industrial statistics in the world, maintaining the level of accuracy.

We do not really need to be the number one, because we are not in competition but rather in collaboration with other official statistical agencies. The important point of using this target is that it allows us to easily use benchmarking techniques. We look for statistical agencies that are quicker than us with a specific survey, then study its methods, and try to introduce them into our office, if possible.

The key success factor in achieving timeliness is, first of all, to want to do it! Timeliness should be considered a major goal in our production system, rather than just a little problem. Therefore, we need to save time in all the phases of the statistical process.

Adapting questionnaires to the accounting practices of the enterprises, improving our relationship with enterprises and introducing selective editing methods, are additional key success factors in achieving timeliness.

We have taken the following measures in order to adapt questionnaires to the accounting practices of the reporting enterprises:

- The requested variables and the valuation rules are adapted to those of the enterprises.
- The observation units are adapted to those units for which enterprises have available information.
- Different models of questionnaires adapted to the branch and the size of the enterprises are used.
- Questionnaires are personalised.
- The transmission formats (paper, fax, diskette, e-mail) are adapted to the choice of the enterprises.

The underlying principle in this approach is that enterprises provide data in the same way they produce them for their own use, and the statistical agency re-elaborates them for analytical purposes, if necessary.

Adapting questionnaires to the accounting practices makes answering them easier and quicker. It also results in fewer errors made by the enterprises. All of this leads to an improvement in the time of dissemination.

Another key success factor in achieving timeliness is improving our relationship with reporting enterprises. One of the ways this is being achieved is by offering the enterprises free of charge data tailored to their needs. This new practice (described with more detail in the following pages) has produced an increase of interest on the part of the enterprises, which are consequently filling in questionnaires sooner and with more care.

The use of selective editing methods (Granquist, 1995) is a key factor to improve timeliness in one of the most time consuming statistical phases (i.e. data editing). Using time series modelling joined to the selective editing philosophy (Revilla-Rey, 1999) is being quite useful to save time in editing continuous surveys.

The results of the timeliness project can be seen in the graph.

## **5. Improving a service of tailor-made information**

In recent years, customers are increasingly asking for more and more detailed statistical data on the industrial sector. In particular, more branch and geography detail is often demanded. Standard means of dissemination are not enough to satisfy customer needs. Customer satisfaction surveys also show that specific tailor-made information, adapted to each of the customers, is requested.

To face this problem, a project to improve a service of tailor-made information was launched.

As a consequence of the project, we accept all of our customers' request for data about variables included in our surveys questionnaires, at any level of branch and geographical breakdown, whether these variables are disseminated in the standard publications or not. Likewise, specific computer programs to obtain any statistical calculation needed by customers are devised and carried out. For example, we have calculated productivity, concentration, specialisation, diversity, and competitive indices, minimum efficient sizes, cost-disadvantage ratios and other calculations based on unnamed formulas requested by customers.

In addition, we have carried out regressions and other statistical tasks. In this case, we only devise and run the computer programs, leaving the responsibility of choosing the way in which these data should be processed up to the customers.

Of course, all of these data are supplied under the strictest rules of statistics confidentiality. Much care is taken and computer programs are run to avoid the disclosure of any confidential data.

If requested, we advise customers about the information they need and the possibilities the statistical system can offer to them. Likewise, we produce reports about the quality of the data contained in the tailor-made information.

Often, customers request information that can only be obtained through several surveys. In this situation, the main problem is establishing coherence among the different surveys.

To face this problem, we are currently developing an integrate system of microdata for industrial statistics. The idea behind this system is that different surveys should not be independents, but rather work together as a whole. Working with such a system, the customers' demands for data, regardless in which survey they are found, can be met by creating statistical tables that mix microdata from the different surveys, thereby offering customers a coherent set of information.

## **6. Offering individual data tailored to the reporting enterprises**

Enterprises often wonder what use questionnaires are to them. This dissatisfaction on the part of the enterprises (our suppliers) contrasts sharply with our customer general satisfaction.

The solution that we found to this contradiction was to change our suppliers into customers. Hence, we offer tailored data on market share, as a "payment" for filling in questionnaires.

We provide the reporting enterprises with answers to the following questions:

- What is my market share in my business activity?
- How many enterprises have a larger market share than mine?
- What is the overall share of those enterprises with a larger market share than mine?

The reaction of enterprises to this offer has been quite positive. As an example, the president of the Industry Commission of the Spanish Confederation of Trade Association has said the followings words: "The industrial surveys carried out by the National Statistical Institute are the best example of a joint venture between industrial enterprises and public statistical offices. In other words, they are an excellent illustration of the advantages that may be achieved by means of an efficient collaboration between public and private sector."

Hence, we are trying to use a new model of relationship with enterprises, that we have named, in the words of the president of the trade association, the “joint venture model”. The underlying principle of this model is that our relationship with reporting enterprises should be based on a relationship of mutual use and collaboration, rather than on the legal duty of the enterprises to fill in compulsory questionnaires.

The joint venture model can be seen as a particular case of the virtuous circle pointed out by Fellegui (1991): “Public confidence is essential to win co-operation for our surveys; this is a prerequisite for high quality statistics; high quality must ultimately be the foundation for public confidence”. Because of the increasing interest of enterprises, they are filling in questionnaires sooner and with more care. Hence, we can produce better statistics.

An important point of using the joint venture model is that both timeliness and accuracy can be improved, reducing the perceived enterprise burden at the same time.

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## Dates of Dissemination

