

Quality Control of Monitoring Systems

Il Controllo di Qualità dei Sistemi di Monitoraggio

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Riassunto: L'importanza crescente del monitoraggio nell'ambito degli investimenti pubblici si accompagna alla necessità di assicurare un adeguato livello qualitativo ai sistemi di monitoraggio e, conseguentemente, al prodotto del monitoraggio. Il lavoro propone un modello teorico di riferimento per il controllo di qualità di un generico sistema di monitoraggio.

Keywords: Monitoring System, Quality.

1. Introduction

During the last years, there has been an increasing sensitivity on public investment control through the monitoring of their implementation. There is no doubt that the major incentive towards this direction has been firstly produced in the European ambit and then accepted by Member States. An example is represented by the present legislation on Structural Funds that request to Member States to setting up systems “.. to gather reliable financial and statistical information on implementation, for the monitoring indicators...and for evaluation...” (Regulation CE n. 1260/1999, Title IV, Ch. I, Art.34). Although the need for monitoring the implementation of Structural Funds precedes the present programming cycle, only now there is a strong awareness into the Italian Public Administration, both at central and local level. Moreover, the diffusion of the monitoring practices seems not to be restricted only to the investment financed with European Funds, but under the impulse of the European Commission, it covers all public investments. The need for monitoring public investments proceeds at the same pace as the need to ensure an high qualitative level of the data produced by monitoring systems. This can be explained by the fact that monitoring is effective only if there are data that respond to certain quality requirements.

A monitoring system has to reflect the real state of investment projects or investment programmes, through the production of indicators on implementation; on the basis of such indicators it has to enable the timely individuation and resolution of the critical situations. The quality of a monitoring system is concerning with the respect of the following requests of the final user (i.e., EC, central or local Public Administration):

- ◆ The accordance of data to the rules of financial and procedural admissibility;
- ◆ The accordance of data to the requested documentary basis;
- ◆ The data timeliness;

- ◆ The coverage and the identificability of the projects (when investment programmes imply the realisation of several projects) and the coverage of the observed variables;
- ◆ The possibility to produce indicators aggregated at different levels. This needs the integrability of the data and, consequently, the homogeneity of the adopted classifications;
- ◆ The possibility to individuate the critical situations related to the realisation of the investment project, that is, the possibility to calculate specific and relevant indicators;
- ◆ The accessibility of data and of the related documentation;
- ◆ The security of data and of the related documentation;
- ◆ The transparency of the projects' procedures.

On the basis of the definition and of the objectives of the monitoring, the quality of the monitoring process can be assimilated to that of a production process of the statistical information. The similarity between monitoring and statistical systems facilitates the definition of a model for the quality control of public investments monitoring. In the following section, the model is proposed in general terms, with a brief discussion of the main issues.

2. The reference model for the quality control of monitoring system

The building up of a control quality system is based on the definition of a model that, on the one hand, describes the monitoring process and, on the other hand, constitutes the theoretical basis of the controls. The model is constituted by four dimensions: the *information* dimension, the *organisation* dimension, the *time* dimension and the *cost* dimension.

The first dimension regards the process that produces indicators starting from individuals events generated by the real investment. In particular, we individuate the following components that correspond to logical phases of the process:

- ◆ Events;
- ◆ Rules;
- ◆ Sequences of alphanumeric information;
- ◆ Operations;
- ◆ Indicators

Let real investment projects produce a set of events **E** (action, goods and/or services), to which is associated, through a system of rules **R** (for examples, the produced documentation and the legislation of the projects), a set of sequences of alphanumeric information **V**. The elements of each sequence are functions of the events **E** through the rules **R**:

$$V = R(E) \quad (1)$$

Where **E** is a set of “true” data, that is unbiased information.

From sequences **V**, through the operations **O**, we have the indicators **I**:

$$I = O(V) \quad (2)$$

The operations *O* transform the sequences *V* into the related statistical variables useful to calculate the indicators *I* and to make further statistical analysis.

The described process is the theoretical reference “model” for the quality control. In the real practice, instead of *V* we observe the sequences *v*. *V* and *v* can be different because the events *E* are not been correctly represented or because the rules *R* are not been correctly applied. In the same way, the operations *O* are subject to errors that can bias the “true” indicators *I*. In the actual contest of the public investment monitoring, the operations are essentially related to data input, data interchange and data control; in particular the last one can be considered as a “filter”, that is the control if the rules *R* are been correctly applied (this operation is also typical in the statistical systems).

We can distinguish two kinds of quality control: *vertical* (or *process* control) and *horizontal* (or *product* control). The vertical control regards all phases of the process and their connections; and it produces process *performance* and *risk* indicators. The *performance* indicators, which are constituted by simple events or function of events, describe the process development and enable the individuation of errors related to its different phases. The *risk* indicators are constituted by simple events, functions of events or functions of indicators; they enable the individuation of factors that can compromise the effectiveness and the efficiency of monitoring system. The horizontal control regards the product of monitoring system and produces *data quality* indicators. They enable the evaluation of the process effectiveness in terms of data precision (that is the closeness between observed and “true” data) and data relevance (that is, the data capability to satisfy the user needs).

Synthetically, quality is evaluated on the basis of the characteristics: process *reliability* and data *accuracy* and *relevance*. The first characteristic can be estimated by indicators derived from information produced during the process, that is through filters that operate on the alphanumeric information sequences; the second characteristic is directly estimated through control surveys (to evaluate the distance between theoretical and actual values), while the third characteristic depends on the choice of indicators, *I*, and on the related events *E*, that would produce crucial and not redundant information on real investment projects.

The second dimension is the *organisation* one. The organisation dimension regards the definition of managing centres and the qualitative/quantitative levels of the human and technological resources used in the monitoring process. The organisation, too, is responsible for the definition of data monitoring, verification and transmission procedures, and of indicators and classifications. The organisation dimension constitutes the real basis on which the information system is built; for these reason, it is a determining factor of monitoring quality level. The elements that should be considered in a quality control system are: acknowledgements and education of human resources, the diffusion of the legislation that determines rules *R*, responsibility levels of system operators, technological resources and, finally, data exchanging and treatment structures. The *organisation* is a very complex dimension in particular in the context of Structural Funds, where the structure of the offices responsible for monitoring and accounting systems, the training of operators and the technological resources are quite different in the different Regions; it can determine an heterogeneous degree of data quality in the national monitoring system.

When the definition of quality control system is contextual with the definition of monitoring system (as we propose), quality assumes the role of guideline of monitoring system; instead, when the definition of quality control system follows the definition of

monitoring system (as sometime it happens) quality is a criterion to verify the organisation of monitoring system. In this case, we have to survey the characteristics of system organisation and to calculate the related indicators (as above identified). Then we can establish the connections between such indicators and the *performance* indicators of monitoring system.

The third dimension is the *time* one. The importance of timeliness in monitoring process is clear if monitoring has the objective to control in time risk factors or if actions are in temporal succession. Timeliness, actually, represents a relevance component, but in our model it is considered a specific dimension, because we believe that it constitutes a fundamental characteristic of monitoring.

In addition to the time dimension, the financial aspect (the fourth dimension) represents a further important constraint to take into consideration in the definition of a control quality model of monitoring system. Although the model could meet final user's demands, it would be completely inapplicable if it was not sustainable on the cost side.

3. Conclusion

The proposed model is dictated by the increasing importance that the monitoring of public investments has to ensure a sound management of public expenditure and by the related need to ensure an adequate qualitative level of monitoring.

The theoretical model which is presented with reference to the quality control of a generic monitoring system can be also applied as a guideline in the definition of a monitoring system, or to make ex-ante and/or ex-post controls on monitoring .

References

- Masoni V. (1997) *Monitoraggio & Valutazione dei Progetti*, Franco Angeli, Milano.
- Istat (1989) *Manuale di tecniche di indagine – Fascicolo 6: il sistema di controllo della qualità dei dati, Note e Relazioni n.1*
- European Commission (1999) *Evaluating social-economic programmes, Means Collection*