

# SIGMA\_Q: System of Integration for a Global Management Addressed to Total Quality

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*Abstract:* - Sigma\_Q is an integrated system to manage factories addressed to Business Excellence (Total Quality)The Sigma\_Q cycle is a easy to use method to combine the benefit from Self Assessment Process with the need to get measurable results in a short time in the weak areas of the organization focusing not only on typical improvement tools , but also and mainly on the human resources approach..

*Key-Words:* - Assessment, Process Map, Value System, Performance Indicators, Excellence Planning, Innovation

## 1 Introduction

In the last 20 years many factories introduced the principle of Total Quality Management in their organization in order to get improvements in the products and processes reducing costs.

The main approach of TQM was based on Excellence models (like EFQM) with addition of tools like 8D, 7 Quality instruments and so on.

In parallel they also started with Quality Systems ISO 9000 defining responsibilities, procedures and instructions according to the standard subject to verification by certification bodies.

## 2 Problem Formulation

The two approaches, TQM and ISO did not deal to an holistic vision of the organization creating two different cultures and consequent activities driven in some case under the umbrella of TQM (for example strategic planning, empowerment, continuous improvement and others under ISO umbrella (for example design procedure, process mapping, etc.): this situation is still separating the world of business strategy from world of the process from the Human Resources world. For example very often you don't find the management review document as part of business plan. At the end of the day the three levels - strategic, tactic and operative – are not linked and the strategic planning has a weak connection with operative plan in terms of projects and prioritization.

## 3 Problem Solution

The concept is based on the fact that the strategic level of a factory is related to the organization while the

tactical is referring to processes and operative to local activities.

Normally, Top Managers are dealing the Strategic level while Professionals are dedicated to the operative aspects of the organization: the integration of the management systems can be carried out through a coherent and subsequent linkage between the following elements of the organization:

1. Results from Self assessment Process by Management according an Excellence Model of reference;
2. Results from Operative Processes;
3. Results from People.

The linkage is created by a cycle based on six modules according the following lay-out (see figure 1).

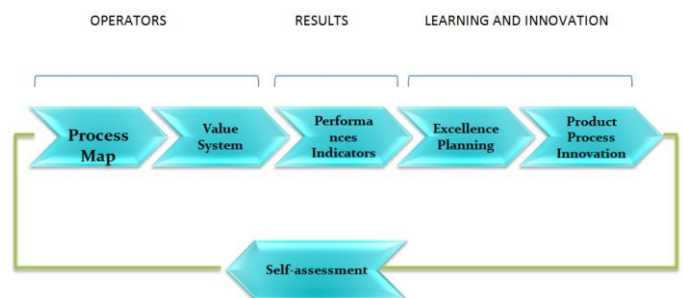


Fig.1. The modules that form the cycle

The modules perform the following activities:

- 1) Self – assessment according to the EFQM model (AV\_BM);
- 2) Process Mapping (PM\_SQ);
- 3) Value System and know how mapping (VS\_KH);
- 4) Key Performances indicators and reaction (MS\_IPR);
- 5) Planning of Excellence Path through prioritization process;
- 6) Product and process innovation based on Quality Function Deployment and Lean Six Sigma.

While the module 1 is related to managers, the modules 2 and 3 are related to middle management (operators), module 4 to results (key performances indicators) and the modules 5 and 6 to learning and innovation process.

### 3.1 AV\_BM module

Self-assessment according EFQM model (figure 2) drives the organization in the first analysis to highlight strength and weak areas: this activity has to be performed by managers based on their knowledge of the factory and after a quick training activity under the supervision of skilled people.

Due to necessity to perform the evaluation in a short and quick time, the process is based more on perception and knowledge of the organization by Managers, than on objective findings and measurable.

The main target is to achieve consensus of Management on the first rating and identification of weak and strong areas by self assessment based on EFQM questionnaire customized for the organization (figure 3).

The process in this phase has to be performed in relatively a short time .The results of the self assessment are rating of:

- the enabler criteria:
  - leadership
  - policy and strategy
  - people
  - partnership and resources
  - processes
- and results criteria:
  - people results
  - customer results
  - society results
  - key performance results.

These ratings automatically archived in a matrix (see paragraph 3.5) and will be data base to be crossed with other results coming from the subsequent modules.

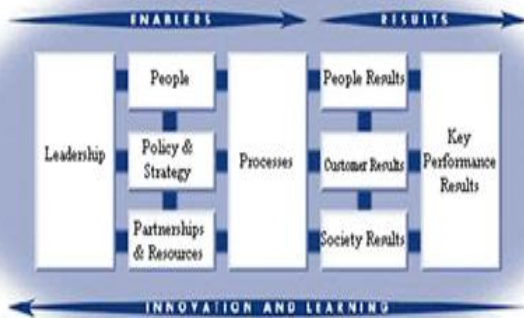


Fig. 2 The self-assessment according EFQM model

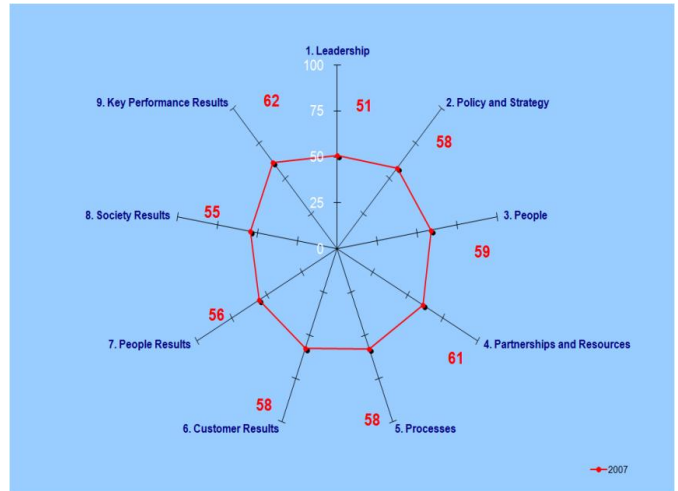


Fig. 3 The self assessment based on EFQM questionnaire customized for the organization

### 3.2 PM\_SQ module

PM\_SQ module provide a comparison map (figure 4) between the existing processes (mainly Quality, Environment and Safety System) and a reference model with the aim to define the process owners and highlight the processes not yet implemented or weakly implemented: this analysis has to be performed by the process owners and even in this case the gap data derived from this analysis are automatically archived in the global file (see paragraph 3.5).

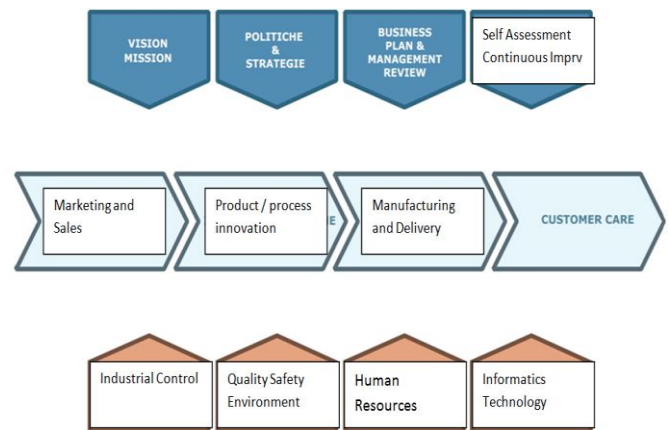


Fig. 4 The process map

Compared with Self Assessment Criteria Process (evaluated on the basis of the questionnaire by Managers) here we have a detailed and measurable picture of the status of the process as seen by the people sitting in the process. As consequence, we will see on the global matrix (paragraph 3.5) some difference between Managers perception /knowledge and Operator analysis.

### 3.3 VS\_KH model

VS\_KH model provide a map of the existing values and competence (figure 5) of the relevant people in the organization with reference to a defined model. Analysis is carried out by HR department together with the Owner of the process to which the people belong. The aim of this module is to highlight the gap (rating %) between requirement and effective results both for competence and social aspects. A fully implemented Value System is based on the fact that all strategically targets are necessary linked to a value and competence model; also in this case the data coming from analysis are archived in the global file (see paragraph 3.5).

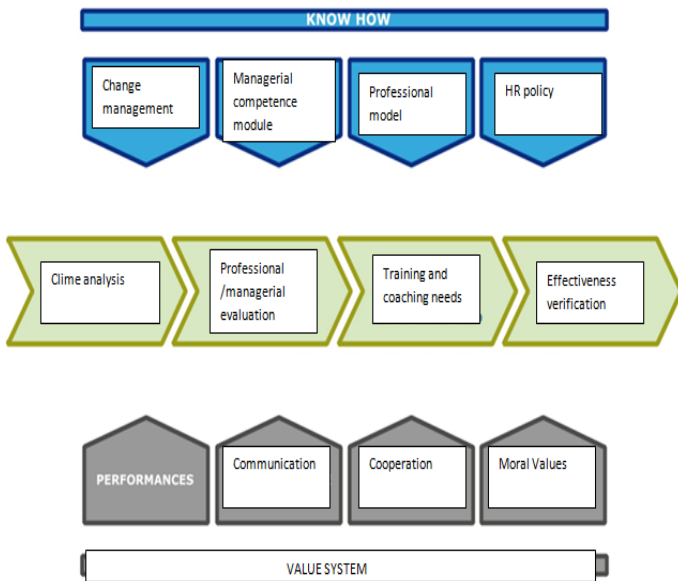


Fig. 5 The map of values and competence

Again, also in this case the results from this analysis and the rating of criteria PEOPLE of Self Assessment will allow to compare Management evaluation with data coming from field.

### 3.4 MS\_IPR module

MS\_IPR module provide a dashboard linked to a system of performance indicators (figure 6) based on existing ones and highlighting the missed ones according the process map model. The aim to have a complete dashboard to start communication process based on champions (indicator/process owners) working team. Again, in this phase the most important aspect is related to establish a communication process inside the organization based on internal customer-supplier relationship. Out of target indicators/process will be recorded also in the global file (paragraph 3.5) to be used for comparison between self assessment ratings and field data.

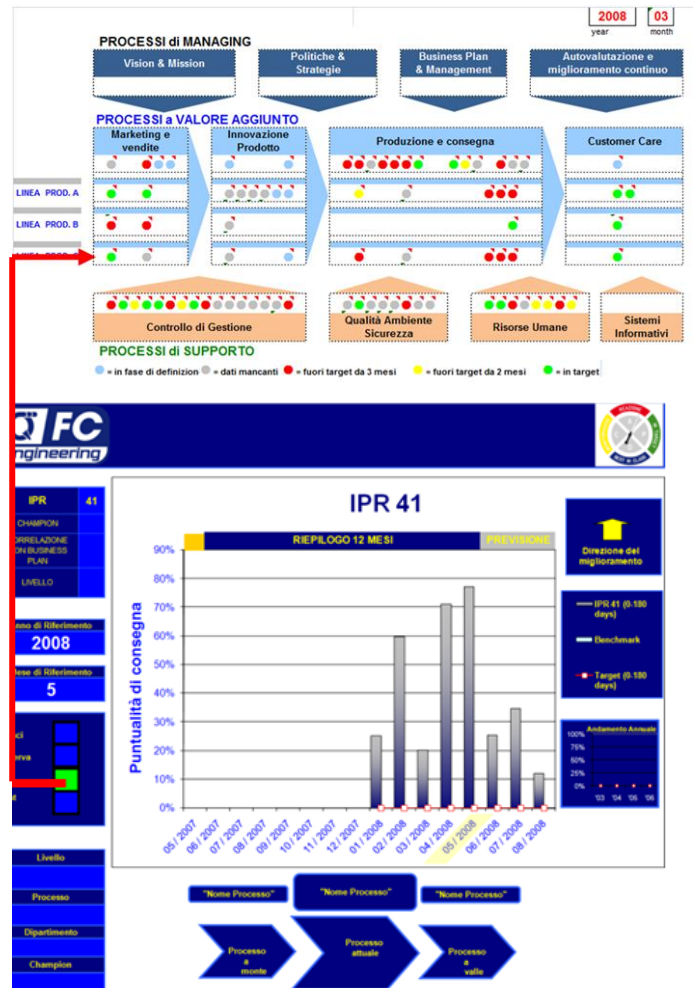


Fig. 6 The dashboard linked to a system of performance indicators

### 3.5 PE\_CI Module

PE\_CI Module provides a matrix (global file - figure 7) where the results from first self assessment process (AV\_BM) are crossed with the data coming from the other three modules (PM\_SQ, VS\_KH and MS\_IPR). In correspondence of each area of the organization (vertical column) where applicable in the horizontal rows it will show red, yellow or green boxes according the adopted criteria used for gap evaluation (for instance green when gap is less than 10% , yellow when bigger than 10% and less of 25 % and red when bigger than 50%). The system will give a first raw picture where is the most critical area of improvement: Managers must compare this picture with the analysis coming from self assessment (AV\_BM). The aim of this module is to find a logic explanation and correlation between the self assessment and modules data and based on this analysis Managers have to confirm or modify the criticity level and find a consensus (prioritization process) on the three main projects (SIGMA\_Q projects) to be carried out at strategic level (organization), tactical level

(process/systems) or operative level (office/ floor activities). The projects must result correlated each other through the enablers criteria and the relevant measurable targets must be represented according result criteria of EFQM model. The results of this module are part of management review (paragraph 5.6 ISO9000:08).

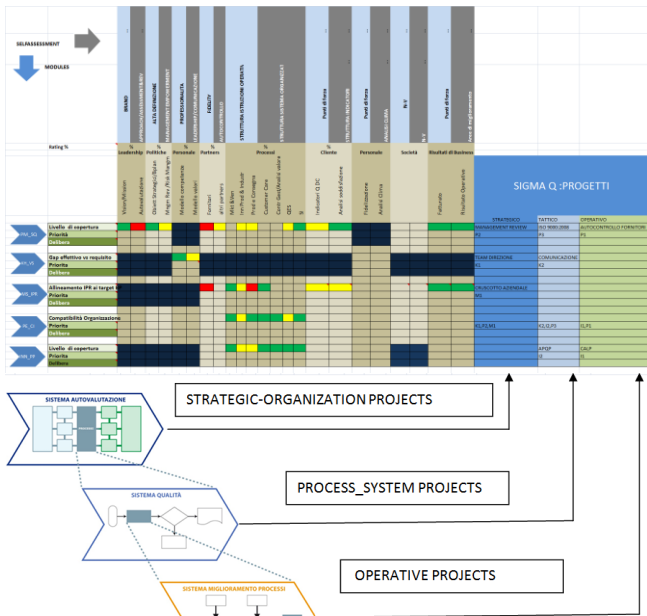


Fig. 7 Cross referencing matrix

### 3.6 INN\_PP module

INN\_PP module (figure 8) provides tools for design innovation (Quality Function Deployment simplified) and process innovation (Lean Six Sigma simplified) in order to implement the projects established in step 5. The aim of this module is to assure the use of standard improvement processes into organization in order to have a self learning organization.

The module provides a detailed check list through which it is possible to identify the weak area at operative level ( for example : TPM, 0 defects, 5S etc...).

Such datas provide a picture of status of implementation of improvement tools into organization.

Based on competence map according module KH\_VS it is now possible to evaluate the ability of the organization to match the gap between requested targets and actual situation. But competence is not sufficient to achieve targets; it is strongly requested to verify also the social aspects and values model . For example , being a process owner able to drive an important improvement project requests not only the classical technical competence but also ,and mainly, a defined leadership style .The module KH\_VS drives the Management to define a requested value suitable for the organization for such aspects ( leadership, ability to

empower, teamwork,planning ,managing diversity etc...) and consequently gives results about the gap between the requested “social “aspects and the effective . So far , at Management level has to be established a training program wich covers not only the technical needs but also the social requirements driving the organization to define training program for Values.

This element highlights that Quality Function Deployment and Lean Six Sigma tools , which are very well known, need not only a technical background but also a new approach in terms of Resources Management ( see also EFQM criteria People Management and Results).

Module INN\_PP has to be crossed with module KH-VS to assure that the asset of the organization is very well prepared and trained to work on these tools. For this reason SIGMA\_Q system provides a mutual work between engineers for traditional quality tools and labour-psychologists for training people in all interaction activities which occur during application.



Fig. 8 Tools for design innovation

## 4 Conclusion

The SIGMA\_Q cycle will re start with a new self assessment process to establish the new rating achieved after the implementation of the projects.

Having defined the prioritizing process at the three levels (Strategic / Organization, Tactic / System, Operative / Activity) the approach “Top to Bottom” works in parallel to the “Bottom to Top” approach assuring the integration between management and operative levels of the organization and filling the gap between strategic planning and operative work .

References:

[1] www.efqm.org