

THE RELATION AMONG SIX SIGMA AND OTHER MANAGERIAL TECHNIQUES OF IMPROVING THE PERFORMANCES OF THE ORGANIZATIONS

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ABSTRACT: *In this work we proposed myself to approach aspects bound to the importance of Six Sigma method in what concerns the growth of the organization's performances within a dynamic and hostile environment marked by the nowadays slump and by the more and more sophisticated requests of the customers. Within my work I have gone over and presented the necessity of improving the processes through the Six Sigma method and I have analysed the external and internal factors "relatively fluid" and "relatively rigid" which influence the attainment of some superior levels of processes' performance. I have studied the Six Sigma model of improving the processes and I have emphasized the operational and managerial influences of this model. I have also analyzed the relation of complementarity among the management system ISO 9000:2000, the Kaizen techniques, Total Quality Management and Total Productive Maintenance and the strategy Six Sigma which has as result the growth of the economic performances.*

KEY WORDS: *quality, Six Sigma, performance, strategy, total quality management*

1. INTRODUCTION

In a dynamic socio-economic environment, the organizations must be permanently oriented to the long-term improvement of the processes. The improvement of a process does not represent only a goal, this is directed to the growth of the organization's competitiveness or, in other words, to the growth of the organization's ability of realizing, in its domain of activity, superior results in comparison to similar structures (Thawani, 2002).

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Competitiveness is relevant through the level of performance the respective organization attains at a certain moment, where performance is defined as being the combination between efficacy and productivity (Brad, 2006).

Because both efficacy and efficiency are dynamic parameters, performance is nothing else than “the area of dynamic equilibrium” between the two parameters at a certain moment.

Therefore, from this perspective, performance represents the organization’s ability to contribute to “the balanced satisfaction” of all interested parts.

Starting with these elements, the effort of improving the performance of the organizational processes must generate both the growth of global performance of the organization (meaning to lead to the growth of organizational excellence) and the attainment of this objective in a balanced way, through keeping a superior balance between efficiency and efficacy. Thus, the improvement of a process must lead to:

- The growth of the process’ efficacy;
- The growth of the process’ efficiency;
- The growth of the process’ level of excellence(through the growth of the satisfaction level of all interested parts associated to the respective process);
- The assurance of an internal dynamic equilibrium (through the assurance of an evolution with the same dynamics for both efficiency and efficacy);
- The assurance of an external dynamic equilibrium (through the avoidance of perturbing the internal dynamic equilibrium of the processes inter-correlated with the considered process).

If the environment of a process is seen from the perspective of the previously underlined vectors, a lot of provocations can be easily identified, as well as constraints, to the attainment of some superior levels of the processes’ performances.

In the case of an organization, the provocations and constraints depend both on content and on intensity, on a series of external and internal factors “relatively rigid”, as well as on a series of external and internal factors “relatively fluid”.

Within the internal factors “relatively rigid” we can include: the type of the economic activity developed by the organization, the organization’s character (public, private, mixed), the organization’s age, etc. within the group of the external factors “relatively rigid” we can consider: the geographic location of the organization from the perspective of climate and relief conditions, the geographic location of the organization from the perspective of political, historical, cultural and social conditions, the geographic location of the organization from the perspective of economic conditions.

Within the internal factors “relatively fluid” we can include: the human resource, the managerial potential, partnerships, financial resource etc. in the last category, that of external factors “relatively fluid”, we can bring in: the access to financial resources, the market evolution, the competitors, the political factor, the customers’ behaviour, etc.

Therefore, one can appreciate that to generate mature solutions in the effort of improving the processes within the internal and external factors presented above, the use of some modern managerial techniques is imposed, through which the Six Sigma model is a solution.

2. THE SIX SIGMA MODEL OF IMPROVING THE PROCESSES

Six Sigma is a model of long-term improvement of processes, resulted from practice, because the approaches of type Kaizen could not surpass sigma level 3 or 4 of the processes' performance (J. Ming C., Jia-Chi T., 2004). To reach some higher levels of processes' performance - sigma 5 and 6 - the use of some more elaborated methodologies and instruments is requested. Model Six Sigma measures this performance through the organization's ability to lower the damage (the number of non-concordances considering the number of opportunities) (Cronemyr, 2007).

The model Six Sigma measures this performance and can be applied to all the structures of an organization. Thus, the high management can use the Six Sigma model to improve the rate of market occupancy, to increase the profitability and viability of the organization on long term. The management at an operational level can take into consideration the Six Sigma model to improve efficiency and to lower the operational costs. At the production level, the Six Sigma model can be applied to lower the non-concordances, as well as to improve the processes' ability (Cronemyr, 2007).

The Six Sigma approach is actually a complex of strategic and operational methods through which, the attainment of an excellence degree in the quality of products or services offered by a certain organization, industrial or services, is followed.

This "degree of excellence" (Isaic –Maniu, Vodă, 2008) is not just a figure of speech - it can be quantified and thus, there is the possibility of relating to this level through different indicators which measure the degree of rapprochement or remoteness from the followed best.

Thus, it is outlined the fact that the main aspect of the Six Sigma approach is the managerial one, of organizing and leading the activity of quality structure, in this activity being incorporated the operational aspect (methodological, procedural) which is based on the practical and theoretical arsenal offered by the mathematic statistic.

Six Sigma, this "new philosophy of quality" refers to the identification of some vital elements which can lead to the improvement of the activity at all the levels of the organization, as well as to the quantification of these elements through different "metrics" of performance.

In Motorola vision, which introduced for the first time this concept, the vital elements refer to the following:

- The production cycle, the time allocated to a certain activity, which must be lowered to the possible maximum;
- The capability of each and every process developed with the respective organization.

The processes must be able in such a way that the probability of the supplied products not to respect their specifications to be smaller than the probability of a normal variable to take higher values than six standard deviations from its average.

A Six Sigma objective or a quality at a Six Sigma level means that a quality of 99,99966% to be produced, meaning to have only 3,4 non-concordances at a million of "opportunities".

Another interpretation derives from here and also, another objective, that of satisfying, close to perfection the client's requests. Actually, the term of Six Sigma refers to a target of performance, derived from statistic, to operate only with 3, 4 deficiencies to each and every million of activities or "occasions" (Pande P., Neuman R., Cavanagh R., 2009).

Another way to define Six Sigma is as a general effort of changing the organizational culture, to direct the company to a better satisfaction of the clients, to profitableness and competitiveness. We can say that Six Sigma represents a comprehensive and flexible system to realize, sustain and maximize the success in business. Six Sigma is guided only by the close understanding of clients' necessities, by the disciplined use of information facts and statistic analyses, as well as by the special attention given to the administration, improvement and remodelling of the business process (Pande P, Neuman R., Cavanagh R., 2009). The obvious benefits of Six Sigma model refer to: the lowering of costs; the improvement of productivity; the growth of market quote; the lowering of time of the activities cycles; the lowering of the deficiencies number; the changing of the organizational culture; the development of product or service and many others.

3. SIX SIGMA, ISO 9001-2000 AND OTHER MANAGERIAL TECHNIQUES

Among the Six Sigma strategy and other managerial techniques focused on quality there is a relation of complementarity which has as a result the increasing of an organization benefits which implements these strategies of quality, materialized in a profit growth, costs lowering, the lowering of the deficiencies number, the growth of clients' satisfaction and their devotion.

The ISO certification of the firms represents an indicator of performance, but with all these, the certification given, based on a standard of quality, does not offer any guarantee over the fact that the products realized by the respective firm respect certain standards of quality or that, from that moment they will be better in what concerns the quality. Also, ISO does not establish procedures to be followed, but it only gives to the existing ones a standard. These two observations constitute, in a way, the essential conceptual differences among Six Sigma and the standards of quality management. In fact, the implementation of a Six Sigma program means the delivery of products and services of exceptional quality through the elimination of all the internal deficiencies.

Thus, a Six Sigma organization will have excellent products from the quality point of view and it will maintain at the same time some extremely efficient systems of the production and administrative. There are common points, too, between the two managerial techniques as it can be seen in table 1.

Thus, the Six Sigma offers a managerial environment, including processes, techniques, training to implement the requests of the standard ISO 9001: 2000 referring to:

- The demonstration of high leadership engagement to the long-term improvement of the efficacy of the quality management system;
- The assurance of competences, abilities and the necessary training in what concerns the statistic techniques and of the management;

- The long-term improvement of the quality management system;
- The supervision and measurement of the consumer's satisfaction;
- The supervision, measurement and improvement of the processes and of product;
- Data analysis.

Table 1. Correspondence between Six Sigma and ISO 9001:2000

The Principle of the Quality Management	Correspondence
The attention focus over the consumer	Six Sigma indicates the way of alignment of the organization's objectives to the consumer's requests, through measuring the obtained performances as a succession of the attention focus over the user.
Leadership	The superior management involves actively in the realization of the Six Sigma projects, in what concerns the assurance of the financial support and the necessary training.
The involvement of the interested factors	The Six Sigma projects are thus conceived to assure the involvement of all the interested factors; the program includes the training assurance for the use of work techniques and the development of team work.
The processual approach	The Six Sigma project identifies, analyses and assesses the organization's processes concerning the improvement of the activity.
The systemic approach	The Six Sigma projects are based on the interaction among people and processes that are connected in an inter-dependent system; this system assures the getting of performances, improved by following some measurable objectives.
The long-term improvement	The organizations which adopt the Six Sigma strategy are aware of the fact that the quality of their products must be improved continually, this being the main factor for success in the conditions of a high competitiveness.
The management based on facts in taking decisions	The Six Sigma teams focus their attention on collecting and analysing data, on their base formulating opinions and arguments which assure a unitary understanding and allow the substantiation of decisions.

Source: (Isaic- Maniu, A., Vodă V., 2008)

The goal of Six Sigma strategy deals with the growth of an organization profit through the elimination of variability, the lowering of deficiencies number and the elimination of damage, which removes the consumer and affect the organization.

The strategy Six Sigma can be understood and perceived in three different ways (Isaic- Maniu A., Vodă V., 2008):

1. *Metric*: the Six Sigma level is assured when there are obtained 3, 4 deficiencies per one million of opportunities.

2. *Methodological*: Six Sigma is based on the use of two methods DMAIC and DMADV, which appeal to different instruments and techniques of the quality management for their leadership.

The basic methodology of DMAIC method has as principle the following steps:

- the defining of the improvement targets which are in accordance with the clients' requests and the enterprise strategy;
- the measurement of the current process and the data collecting relevant for future comparisons;

- the analysis of the relations verifying and of the factors causality. To determine what sort of relationship is and to try to guarantee that all the factors have been taken into account;
- the improvement or optimisation of the process based on the use of analysis techniques such as the Experiments Projection;
- to control the guarantee that any variance is corrected before it transforms in deficiency. The arrangement of pilot tests to establish the process ability, the transfer of production and after that, the long-term measurement of the process and of the control mechanisms of the institute.

The DMADV methodology consists of the following five steps:

- the defining of cycle improvement targets which are in accordance with the clients' requests and the enterprise strategy;
- the measurement and the CTQ identification (critical to qualities), the product and production process ability and the risk factors;
- the analysis, the projection and the development of alternatives (what projects must be realized at a high level);
- the details projection, the projection optimisation, the planning for the projection verifying. This phase needs simulations;
- the projection verifying the organization of pilot tests, the implementation of the production process and the delivery of the project to the beneficiary.

3. *Philosophical*: Six Sigma supposes the lowering of the organization processes' variation, the focus of attention over the consumer and taking decisions on data and facts. The comparisons among the managerial techniques of improving the performances (Kaizen, Six Sigma, Total Quality Management, and Total Productive Maintenance) are very suggestive, as it can be seen in table 2.

The techniques Kaizen, Six Sigma, Total Quality Management and Total Productive Maintenance have the same essence and use the same stages for the processes optimisation. They do not exclude themselves reciprocally, but it is very important that the chosen method to be implemented with flexibility, following the realization of the final objectives. Otherwise, a lot of companies use, at present, a combination of Lean Sigma or Kaizen Sigma.

4. CONCLUSIONS

The Six Sigma method integrates elements of managerial culture, as well as elements specific to quality, which are essential for the lowering of the quality performances of an organization at a level of excellence. Six Sigma is not a substitute of the quality management system and is something more than a system of quality as TQM or ISO, having this way a trans-disciplinary character.

The Six Sigma specialists consider that the success in business consists in producing what is asked first and faster, better than competitors and that the secret of such a success is even Six Sigma through its methodologies.

Table 2. Comparisons among the main managerial approaches in the quality domain

	Kaizen	Six Sigma	Total Quality Management (TQM)	Total Productive Maintenance (TPM)
Objective	The permanent optimisation of the work processes	The reach of processes and product perfection: “zero deficiencies”	The activity development and the lowering of damage caused by useless processes	Zero deficiencies Zero failures and zero accidents Zero fallings
Principles	Optimisation is realized through the elimination of elements with no value	By measuring the “deficiencies” of a process a method to eliminate them can be found. The deviation from the process perfection must be lowered or eliminated	The realization of quality in all the company operations is obtained by eliminating the deficiencies and the superficial elements	The rise of efficaciousness is realized by eliminating the deficiencies from the process. The optimisation of the process leads to “zero failures”
Defining Element	All the employees are involved in the process.			
The Method of Implementation				
Problem Identification	There are groups (circles of quality) that identify the superficial elements. The processes' performance is assessed concerning the cost and the results quality	There are work groups that assess statistically the deviation of processes from perfection. There are special processes to assess each process	There are work groups that identify the deficiencies from a process	There are work groups that identify the causes of failures and fallings from a process
The solution of problems	Within the work groups possible solutions are debated. The debate is guided by the responsible people of different domains and compartments involved in the analysis	The teams discuss and create special process sheet cards Six Sigma to follow improvements. The debate is guided by realizing some project reports and it is framed in a hierarchic system of Six Sigma leaders	The teams change information obtained from their work experience and observations over the efficiency of different ways of process functioning applied in the past	The teams discuss the ways to reduce the deficiencies. Employees from all the levels are involved in the process of finding a solution for the problems

Source: (Isaic- Maniu A., Vodă V., 2008)

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