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Some thoughts about problems in quality management in small and medium enterprises

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1. Introduction

Statistic data show that participation of small and medium enterprises in Polish economy is constantly growing. The reason is easiness with which they adapt to customers' varied and changeable demands (e.g. costs, production time, product quality, etc.) Their effectiveness and competitiveness on the global labor market depends on the level of using resources they possess; human, informational, and technological. In order to make the usage of them optimal, the enterprises are introducing new management ideas, e.g. lean production and far-reaching organizational and technical changes, for example through carrying out reengineering.

For several years one of the most effective ways to streamline functioning of enterprises has been sensible quality management realized most of all through introducing standards of quality management. Yet, in many cases quality management system does not provide expected results. The majority of companies is convinced that they are doing it professionally, and teams responsible for and involved in quality management processes with difficulty accept any criticism of their approach. Reality is different though. Most importantly, one can get an impression that a lot of quality management executives do not understand fully what quality management involves, and surely what its critical points are. They lack skills and strength to focus on the most essential things. Even if they notice that quality management is not only a documented quality system, they have not enough determination, sometimes knowledge and preparation to concentrate on awareness of leadership and employees as well as evaluating targets which have been set.

Why is this so? This article is an attempt to answer this question on the basis of observations made on the group of 20 Polish medium and small companies.

2. Confusion with ideas

Most of approaches to defining quality management refer to emotions and have character of rules following of which should guarantee effective and efficient accomplishment of quality goals. These rules are “equipped” with so-called ideas of quality management. Many of them do not go beyond theoretical considerations (or even speculations only), other ones become popular and then become inspiration for creating new ideas. It is not uncommon to accept new ideas with ease for the sake of being on top. It frequently appears that foreign companies force Polish enterprises to introduce new solutions, not realizing that basic rules of quality management have not yet been implemented in them. Not always it is highlighted that ideas which appear one after another have got a solid common ground. They are modifications and improvements of concepts by Juran, Deming and other “classics” (Juran, 2000). At the same time they seriously take into account the specific culture of a country in which they are implemented.

People responsible for quality management get lost in the richness of applied and emerging concepts. Therefore, they need to find a special key to understand them and select best solutions for different circumstances. Worth recommending is working out one’s own model of quality management which would take into account elements best-fitting to a particular organization and conditions in which it is functioning. When selecting those elements it is advisable to be led not only by reasons pertaining to the subject of quality management, but also common sense. It is worth perceiving the concepts of quality management in three groups according to the following criteria:

- workers’ commitment
- following established standards
- quality measurement

Commitment will be mostly TQM and Kaizen, parameterization will be six sigma and SPC; following accepted norms will be ISO 9000 and other standards. The given order determines favorable sequence of introducing quality management ideas into a company: from understanding and commitment of everyone, through standardizing (consolidating) acquired behaviors and actions, to measuring one’s own achievements (and failures).

However, it must be responsibly said that positive effects rarely result from sticking to a single method of quality management. It is more effective to make judicious use of the findings of all conceptions and selecting the elements which are best-fitting to a particular organization. Thus, in some companies motivation and creative commitment of all workers are underlined (it is recommended for companies where high creativity is required), but in others the greatest emphasis is put on measuring the effectiveness of actions (for example in companies where workers are mostly executors). However, it goes without saying that it is necessary to understand requirements contained in standards as basic for quality management. They provide solid ground for the company; constitute a kind of protection against discontinuation of quality control and provision in situations such as longer and unexpected absence of a leader who is responsible for a given field. Other concepts – actually elements selected for a particular company can be creatively developed in such conditions. Their role involves pinpointing rules and determining course of action, figure 1.

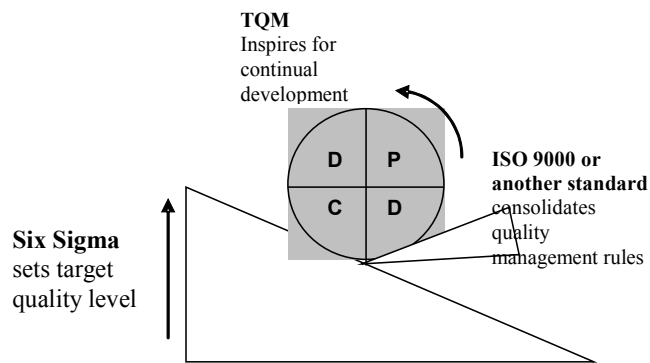


Fig.1. Relations between quality management conceptions.

In conclusion, it can be stated that:

- TQM ensures persistence in quality improvement according to PDCA cycle,
- Six Sigma sets target quality level and enables to measure its current status,
- Quality management system based on accepted standards supports an achieved level.

3. Problem with understanding quality management goals

The ongoing question is what targets of quality management are. If the management of a company takes up actions to modernize technical resources of production, the question is whether these actions belong to the framework of quality management (the actual objective of such actions is improving or at least reducing quality changeability of goods or services) or operations which could be simply attributed to the process of renewing resources which is necessary anyway. The question is whether this routine, technically unavoidable control of a given position carried out in a production process belongs to quality management or simply is a part of managing production?

In literature one can find many definitions of quality management goals. Some of them have their bases in the theory of management. Among them we differentiate classic goals: planning, organizing, leading and controlling, if needed, also improvement function (Hamrol, 2001). Other authors claim that the goal of quality management is setting – on the basis of principles discovered and described in the theories of management and quality – and applying in companies practical rules and patterns of conduct which enable them to achieve in the economic way quality which would meet customers' demands as fully as possible.

However, most of all, quality management is a certain state of mind. This state of mind manifested itself in companies as a result of works by Deming, Juran and other researchers and practitioners of quality problems. It happened at the turn of 60's and 70's when it was realized that changes introduced into companies serve not only to increase productivity but also, or maybe most importantly, to improve quality. The quality factor started becoming the most important condition of success, not only on a local but also global scale. Taking that into account, quality management can be perceived as management of resources, processes and sometimes others factors. It is consciously directed at results associated with quality. A company, no matter if it is a production entity, service company, public utility or a school can say that it is managing quality as long as its actions undertaken for maintenance and improvement are applied in the name of meeting expectations and needs of customers. Customers

are understood as those who are somehow interested in the quality of a product or a process through which that product is created.

One can mention certain analogies from life. A car can be perfectly driven from a technical point of view. However, when a driving champion does not realize that he only is one of many users of public road on the one hand his driving may be perceived as technically perfect, but on the other, impersonal and deprived of respect for others or even threatening their safety.

Quality management is not only of multidimensional character (subject, process, resource) but also interdisciplinary. Quality management has got its background in the theory of quality which deals with creating systems of general definitions, statements and models describing and explaining quality phenomena. It makes use of the findings of widely understood management and it uses calculations of expenses. Quality management is based on such disciplines as management and computer studies, economics, sociology, psychology, statistics and many other domains related with functioning of systems, human behavior, etc.

This complexity and interdisciplinarity of quality management means that a manager responsible for quality management has to be extensively prepared and, more than any other area of management, it is especially expected from him to be open-minded and creative. It is inappropriate, though not infrequent unfortunately, to appoint the position of quality manager or quality supervisor to the person with narrow professional qualifications and little experience in realizing basic company processes.

4. Weaknesses of quality management systems

Different factors persuade the company management to take up actions for implementation of quality management system meeting accepted standards, e.g. ISO 9000. The factors most often include: environmental pressure (of competition), prestige, the need to regulate company processes or facilitating cooperation with other companies (Hamrol 2005).

Well-devised, designed and then appropriately managed system of quality management gives a company a lot of benefits and opens new prospects for it. However, there are threats which at different stages of implementation and application of the system may negatively influence the company's functioning. From the author's observations it follows that most often the threats are: lack or inappropriate motivation to implement the system, lack of the management's commitment, inadequate and overloaded documentation, disregarding practically developed settlements, dishonesty of consultants (copying ready-made solutions).

Companies often apply for the quality certificate because market conditions force them to do so. But at the same time they lack unambiguous motivation to introduce changes. As a result, QMS often turns out not efficient enough and ineffective. By employees it is perceived as another bureaucratic obligation, actually not needed, requiring specific expenditures without gaining measurable benefits. In other words, quality management system is implemented and maintained in order to satisfy and meet the demands of certifying entity. It is done without taking into account real needs of a company. Annual auditing done by independent auditors causes hasty preparations and reducing backlogs for example in quality records. The situation is additionally worsened by the fact that certifying entities may tolerate this because they compete with each other and fight for customers. A company which was strictly evaluated by one certifying entity has yet the right to use services of another one.

The problem is the lack of the management's commitment in directing and maintaining QMS. The management often cares more about obtaining the certificate itself rather than having effective QMS. The management expects the results without getting engaged in consecutive stages of implementation. An appointee for QMS matters is given the task to obtain the certificate and he is solely responsible for the success of the project.

There are at least three reasons for which the whole management including the CEO should participate actively in the implementation and maintenance of the quality system. Firstly, changes in the company which are the consequence of QMS implementation are not superficial, they reach the roots of the company's functioning, i.e. the mission, the vision and the strategic goals. These elements constitute the company's strategy and can be determined only at the highest level of management. Secondly, every alternation in a given field requires approval from the manager responsible for that field. If an improvement concerns a division it is necessary to obtain the approval from a division manager. But if the change acts beyond his powers, then the acceptance from a more senior manager is necessary. When implementing QMS, changes often concern whole processes which act across different functional divisions of the company. Therefore, it is necessary to obtain commitment and approval from the CEO who is the only one to have power over all functional divisions and can sanction complex changes in the whole company. Thirdly, managers at all management levels should remember that they set an example for their inferiors. For example, when a CEO declares to his workers that the quality system is very important for the whole company, and at the same time his lack of commitment shows that it is only another certificate itself which matters to him, he cannot expect his workers to take the new system seriously. Without a convincing example "from the top" workers will treat every change as temporary and will inactively wait until the situation is "back to normal". That's why the management cannot limit themselves to giving orders and waiting for results. Every day, managers should prove with their behavior how committed they are and how deeply they believe in the purposefulness of the undertaken actions.

One of relevant threats to effectiveness of QMS is imposing ready-made schemes of quality management by consulting companies. It is especially visible in the systems which are compliant with the norms ISO 9000. The nature of the norm makes it relatively easy to work out universal templates of system documentation. Within the framework of complex system implementation the proposed solutions are not specially designed for the company. Ready-made quality books, procedures, instructions and forms are offered to companies representing different industries. As a result, it often happens that documentation does not fit the specifics of a company; it is too general, too detailed, it has got declarative character and includes too many unnecessary documents, etc. To avoid this kind of situation it is necessary to determine unambiguously the role of a consultant in the process of system implementation. It should be assumed that his knowledge on functioning of the company is by definition too limited to make it possible for him to design the quality system on his own. Therefore, his tasks should be mostly focused on running trainings, supervising first internal audits, helping in practical interpretation of norm requirements and evaluating the documentation of the designed system. The consultant should offer his experience and propose solutions to the company team responsible for system implementation.

The effectiveness of QMS is sometimes limited by documentation which is too detailed and not adequate enough. It often happens that people assigned for authors of

the quality book, procedures, technological instructions, etc. do not have sufficient knowledge and experience in preparing such documents. When trying to show accurately the processes occurring in the company they use descriptive language. Considering the number of problems to be described the documentation becomes too extensive and unclear. The result of that is not using it on every day basis because no one has time to study it. Apart from that, extensive descriptions do not serve well for systematization of problems and may hamper understanding of them. To avoid such threats, authors should be trained in the field of utilizing appropriate tools, i.e. behavior algorithms, responsibility patterns, etc.

The effect of overdeveloped and unclear documentation is rejecting it and not following its directions. It is also the result of insufficient participation of the company employees in designing and implementing quality management system. It happens that the team appointed by the management to design system documentation does not invite for cooperation managers representing different functional areas. Then, it may occur that a team possessing knowledge in the field of designing QMS sets the guidelines for different functional areas without considering their specifics and character. As a result, developed procedures, instructions and forms are not used in practice because they do not satisfy the needs of an organizational unit and often make its work too complicated.

5. Quality Systems Measurement

Strategic and operational goals as well as effectiveness of undertaken actions and conducted projects have to be regularly monitored and evaluated. This is another danger for quality managers, but not only them, also managers directing other areas of company functioning. Monitoring most of all requires deciding about the collection of indicators and selecting an appropriate measuring system enabling to measure them (Benbow, 2003).

Next, the measuring system has to serve the purpose it is designed for. While in the automotive industry the research on appropriateness of a measuring system is obligatory, in most other cases, not much attention is paid to that (Musiał, 2005). As a result, a person measuring a given indicator often does not realize if the changeability brought in by the measuring system composed of a human, measuring tool, (method with instruments) and environment is appropriately smaller than (and it should be a few times smaller, in important measurements at least 10 times smaller) the changeability of a measured quantity (process changeability) which must be set and compared with a required or target quantity, figure 2.

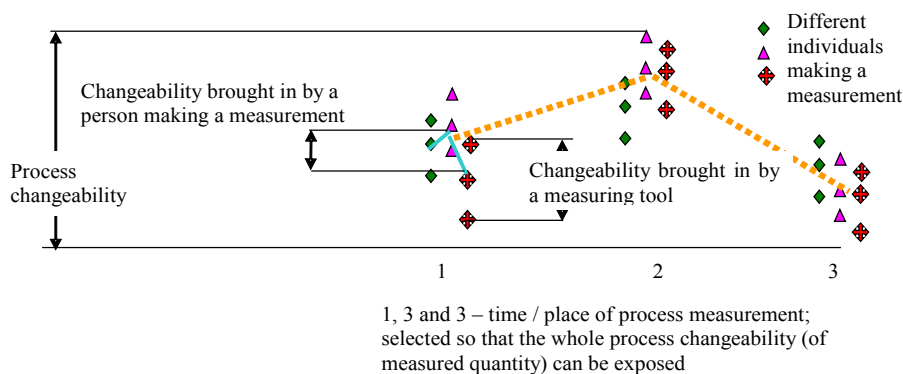


Fig.2. Demonstration of measurement changeability and process changeability.

The problem connected with measurement is as little realized as it is important in the evaluation of a quality management system through audit. How poor this evaluation is shows the research carried out by the author. Its conclusions are presented below. The basis for auditing was a set of control questions grouped in 25 areas, shown in the table. For evaluating each area a particular score is given – maximum values are given in the column of the second table.

Table 1. Areas and evaluation score

Evaluated area	Maximal score
1. Planning (quality targets)	130
2. Work organization	100
3. Staff	120
4. Data analysis	70
5. Quality costs	80
6. Benchmarking	60
7. Supervision over documentation, data and records	100
8. Relations with customers	70
9. Designing	140
10. Technology development	100
11. Controlling and research activities	120
12. Statistical methods	90
13. Identification and ability to be identified	30
14. Purchases	60
15. Product realization	60
16. Packaging and storage	70
17. Transport and delivery	50
18. Production processes equipment	60
19. Control-measuring equipment	100
20. Work conditions	50
21. Complaint servicing	60
22. Examining customers' satisfaction	80
23. Products incompatible with needs	80
24. Internal audits	90
25. Corrective and preventive actions	30
TOTAL:	2000

Three auditors – independently from each other – audited 7 suppliers. The results of total evaluation (total from evaluation of 25 areas listed in the table 1) are put together in table 2.

Table 2. Analysis results done by 3 auditors and 7 suppliers.

Supplier	Auditors' evaluation			Discrepancy between operators	Supplier's average score
	A	B	C		
Supplier 1	960	700	876	260	845,3
Supplier 2	760	700	830	130	763,3
Supplier 3	1257	1120	1400	280	1259,0
Supplier 4	1002	750	900	252	884,0
Supplier 5	900	710	800	190	803,3
Supplier 6	1320	979	1050	341	1116,3
Supplier 7	800	770	698	102	756,0
Average	999,9	818,4	936,3	221,1	918,2

Using the tools of MSA method (Measurement System Analysis) the indicator R&R was calculated. It is the quotient of the changeability of a measuring system in the total changeability of analysis results. The value of 57% was gained. It means that percentage share of the measuring system changeability in the total changeability of analysis results ($\%R \& R$) amounts to 57%. In practice it means that if the difference between the results of quality management systems in two companies (where one company was evaluated by evaluator A, and another by evaluator B) amounts to less than 57%, then it is necessary to make conclusions about the “superiority” of one system over another in a cautious way.

While the selection of indexes and measuring system is rather a one-time action (except necessary operations correcting their inappropriateness), running measurements is a continuous activity. Unfortunately, regularity expressed by haphazardness and superficiality of these actions is often observed. Indexes are measured, processed, and results of analyses are hung on boards – which is right – in places accessible for anybody interested. But it often happens that people do not understand the meaning of figures and graphs. The reason of that is the lack of deep understanding of processes expressed by those figures as well as incomprehension of the analysis tools themselves which were applied for gathering and processing data.

6. References

1. Benbow D., Berger R., Elshennaway A., Walker H., (2003); *The Certified Quality Engineer*, ASQ Quality Press, Milwaukee Wisconsin
2. Hamrol A., Mantura W., (2001), *Zarządzanie jakością. Teoria i praktyka (Quality Managment i theory anf practice)*, Wydawnictwo Naukowe PWN, Warszawa
3. Hamrol A., (2005), *Zarządzanie jakością z przykładami (Quality Managemnt in Examples)*, Wydawnictwo Naukowe PWN, Warszawa
4. Juran J.M., Godfrey A.B., (2000), *Juran's Quality Handbook*, McGraw-Hill, New York
5. Musiał M., (2005), *Parametryczna metoda oceny systemu zarządzania jakością w przedsiębiorstwie produkcyjnym (A parametricla Assessment of Quality Managemnt System)*, Politechnika Poznańska, Poznań