

## CREATIVE QUALITY MANAGEMENT – PERSPECTIVE FOR SMES

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### Abstract

*Quality management has several developmental phases. These phases are directly proportional to dependency from the needs and changes in economic practice. The quality management system is generally associated with a certain level of normative documents. This approach has been already overcome. Begins a new era – the area of creative quality management. The content of our contribution will highlight new perspectives for SMEs in the context of creative quality management.*

**Keywords:** *creative quality management, SMEs, normative documents, economic*

### 1. INTRODUCTION

The term quality is a category which was present in ancient times. On the other hand, the concept of quality management has only been introduced since the second half of the last century, although the concept of quality management had its own genesis. In general, quality management is always conditioned by the achieved level of development of production forces. Therefore, we can say the beginnings of quality management incurred in the period of the first industrial revolution, when the discovery of the steam engine enabled the use of machines in the production process, resulting in the creation and development of division of labor. Before, the product was produced by a worker who was also responsible for its quality. As a result of the division of labor, it is no longer possible to detect who caused the deficiency of the manufactured product and thus there is created a new working category "quality controller" in the production process. The second industrial revolution, which represents the use of electricity in the production process, allows mass and mass production. As a result of this change, is creation of a separate organizational structure and "technical control departments" are created. And since it was not possible to control every product in the mass production, a selective control is created and in the thirties of the last century is encountered the use of statistical methods in control. The next stage of development is the third industrial revolution that finally leads in 50s of last century to the emergence of quality management. In this context, has to be accentuated that all quality gurus stress that in quality assurance are involved all organizational structures of the enterprise. At the same time, it should be emphasized that quality management is a summary of activities aimed at producing products that satisfy the customer by their properties, which results in the customer purchasing such product. But the purpose of business activity is not to satisfy the customer but to ensure the return of the invested capital, that is the realization of the products at such prices that ensure the profitability of the production of the respective product. It should be emphasized that the goal of production is not to satisfy the customer, it is only means of achieving the goal of making profitable production of this product.

### 2. CURRENT STATE OF QUALITY MANAGEMENT

The issue of quality management as a result of the further development of production forces but mainly the development of international trade relations which exceeded not only the boundaries of individual enterprises, but also the boundaries of individual states. The development has gone so far that the European Union has also begun to address the issue of quality, with the establishment of a technical committee on product quality issues. With regard to international trade relations, it has proved necessary to address the issue of quality by adopting international documents that address this issue. As a result, the International Organization for Standardization (ISO) has started to address quality issues. Thus, in

the mid-1980s, the first ISO standard focused on issue of quality management was developed. However, this standard was not focused on the issue of quality management as a whole. It was the result of several opinions on how to contribute to customer protection and not at all about quality management at the manufacturer. The purpose of this standard was to ensure confidence of the customer in the supplier ability to comply with the conditions set out in the contract with regard to the quality of the products supplied. As a result, it was focused only on the supplier's internal processes, mainly in manufacturing, as the other processes of supplier were not of interest to the customer. This standard was the best of all and from the others that were gradually developed in the form of amendments. Its advantage was that it contained instructions on how the customer should evaluate the supplier regarding his ability to comply with the terms of the contract. This evaluation was not aimed at documentation but at the quality of the produced products, at the share of rejects in production and in deliveries, at fulfillment of delivery deadlines, and so on. This first standard was not certified, the issue of certification and accreditation of consulting firms to issue certificates was addressed only afterwards. The negative feature of this development was that the issue of certification became the subject of a very advantageous so-called. Q-business consulting firms, the validity of the certification was limited in time, gradually every 5 years the standards were amended, and recertification was justified by negligible changes in each amendment, whereas the advantages of the first standard were omitted. The evaluation of suppliers was replaced by a certificate, while the certification did not monitor the quality of the products at all, but only the conformity of the documentation with the requirements of the relevant ISO standard. So today we commonly see that the certificate holder delivers a shipment to the customer in which the proportion of non-compliant "ppm" products can be at 50,000 or more. While the concept of complex quality management was used in the emergence of quality management, this term was later replaced by the term quality management system. This concept is not bad, but the problem is that it means compliance with the relevant ISO standard, while ISO standards are far from being consistent with the concept of complex quality management. The authors of this article claim that the mentioned Q-business led quality management into a crisis. The scope of the article does not allow to gradually address all shortcomings of individual amendments to ISO standards. In this article we will state only the basic shortcomings of ISO standards.

At international conferences on quality increasingly arise contributions that critically assess the role and impact of ISO standards, which causes very irritated reactions from consulting firms. The quality management crisis in relation to ISO standards can be expressed by the following factors:

- The existence and impact of myths in quality management. By myth we understand the claim that something exists or has positive influence, while it is a post-truth claim. Without a claim to completeness, the following statements can be stated among myths: claim that a quality management system certificate is evidence of its effectiveness; claim that model "PAF" reflects costs of quality, while shows the costs of poor quality, the claim that statistical methods are the most effective control of quality, while current selection methods of control, especially with regard to digitization, are no longer applicable, claim that the main objective of the manufacturer is to satisfy customer requirements, while satisfying customer needs is merely a tool to achieve the goal of return on invested capital.
- Normative approach to quality management. Gurus of quality have always emphasized that quality management has to consider and respond to the specific conditions of the business. While ISO standards are the same for business which produces yoghurt and for a company producing e.g. rolled iron, similarly, ISO standards are the same for the company, which has e.g. 5,000 employees and for an enterprise with 10 employees. At the same time, the normative approach does not take into account the basic requirement of quality management, which is continuous improvement of production and products.
- A lax approach of standards to innovation, where innovations are the basis of quality development. Without innovations, quality development does not exist, while the issue of innovations is addressed only marginally by ISO standards.

- Omission of all range of pre-production, post-production and after-sales processes by ISO standards, while it is external processes that currently affect the effectiveness of complex quality management.
- The greatest drawback of ISO standards is the complete ignorance of the economics of quality, where quality economics is the most important quality management process.

### **3. CREATIVE QUALITY MANAGEMENT**

The authors of the paper consider the way out from the quality management crisis through replacement of the normative approach to quality management with a creative approach, approach that corresponds to the production program, technological, organizational, personnel and economic conditions of each company. An approach that is able to respond in a short time to changes in customer requirements, but also to react immediately e.g. to currency crisis, changed geopolitical conditions and so on.

The main task of a creative approach to quality management is to create conditions for a smooth and efficient course of implementation of innovations in industrial enterprises, and at the same time to implement effective economic management tools in quality management. Of course, this approach also implies a new way of defining quality costs and quality indicators of return. At the same time, the creative approach assumes what the quality gurus have claimed that in practice all organizational structures of the company are involved in quality assurance and hence the costs of quality incur in each of these organizational structures.

Such an approach is particularly suitable for small and medium-sized enterprises. Large enterprises have usually a separate research base and have special organizational structures in place which focus on implementation of innovation. Moreover, large enterprises are not as sensitive to market changes as small and medium-sized enterprises, on the contrary, they often affect the market situation. Small and medium-sized enterprises need to adapt to the demands of the market, which are nowadays changing very rapidly, and therefore SMEs must be able to adapt to rapidly changing market conditions through a creative approach to quality management.

The concepts of creativity, creative approach are not unknown in current professional terminology. Generally, the concept of creativity can be defined as a set of skills and knowledge that, based on scientific or creative activities, enable the realization of new ideas and thus enable the overall progress of society. In industrial production, creative approaches are attributed to activities in the field of innovations. As it was pointed out in the previous section, quality development is actually dependent on innovations, but creativity in innovations also requires a creative approach to quality management. This is a non-rigid approach, not tied to regulations that are valid for 5 to 10 years, but is based on the possibilities of continuous improvement in areas of innovation and also in production and quality management. Despite the amendments, ISO standards still represent a cumbersome and conserved approach that practically does not respond to market changes. Thus, quality management is not what is stated in ISO standards, but a set of activities aimed at realizing current market requirements.

Creative quality management can be defined as a set of activities carried out in individual organizational structures of the company aimed at innovative development of product quality and ensuring such production and post-production processes which guarantee that products have characteristics consistent with constantly changing customer requirements, that all delivery conditions are met and products will be sold at prices that ensure the return on invested capital (it should be noted that the article only concerns product innovations and their implementation).

In accordance with the magic three of creativity, creative quality management can be characterized as a triad of the following activities:

- focus of business activity on the permanent development of quality by implementing an innovative strategy,
- the use of modern methods of quality assurance with a focus on IT use,
- focus of top management of the company on regular monitoring and assessment of quality.

#### 4. THE ECONOMICS OF QUALITY MANAGEMENT AS A PART OF CREATIVE QUALITY MANAGEMENT

As a methodological tool for the implementation of creative quality management, the authors of the paper have developed a model of creative quality management, which they have called by the acronym "RIQP Model". In brief, it expresses the essence of creative research quality management - "Research - Innovation - Quality - Profitability". This model is also applicable to small and medium-sized enterprises, as they usually do not have business research, so when they build their quality management they simply omit research activities or replace them by development. Regardless of the character of the company, its size and technological and personnel assurance the essence of this model is to define all activities related to the development and quality assurance. Another part of the model represents the definition of costs of quality-related activities in individual organizational structures and monitoring the effectiveness of these costs. In this context, we intentionally use the concept of financial costs, because in the implementation of individual activities we also encounter losses and losses are not costs. The activities defined in the next part of the paper are only an aid, as activities always depend on the specific conditions of the company. Using this model, the company can assemble its own quality management model in the form of a puzzle and adjust it continuously according to changing conditions. For the sake of completeness, it should be noted that if a customer requests an ISO certificate, this cannot be avoided. But the company in question has to realize that it has a quality management system certificate, but does not have at all the quality management.

Economic aspects are an integral part of creative quality management. As mentioned above, all departments of the company participate in quality assurance. In contrast to the current understanding of quality economics, we fundamentally divide costs and losses, since the losses do not pass into the value of the product and therefore do not have the character of costs. Therefore, we talk in individual parts of this paper about financial costs of quality. Quality management is an integral part of business management if we accept the implementation of creative quality management in the company. Accordingly, we have introduced the concept of economics of quality management instead of the previously used (though totally negligible notion of quality economics). The quality management economics can be defined as a set of activities in individual organizational structures of the company focused on quality assurance, definition and monitoring of financial costs for these activities and regular evaluation of quality effectiveness as well as individual parts of financial costs of quality. With regard to the financial costs which need to be monitored and used to assess the effectiveness of the quality, we have divided these costs in 3 groups:

- research and development costs CRD,
- quality costs, internal and external losses associated with retaining current customers, this part of costs is called defensive quality strategy CD
- quality costs, internal losses and external losses associated with acquiring new customers, which we have identified as an offensive quality strategy CO.

We have labeled this breakdown of financial costs of quality as a triad of quality and, by analogy, we have also identified individual quality management activities. If we defined in the previous section the creative quality management as a set of activities, using the above breakdown we can express quality management as follows:

$$AQM = ARD + ACD + ACO$$

It means literally that creative quality management activities represent a summary of activities for science and research, activities to retain current customers and activities to attract new customers. In the proposed model, we assigned individual activities to individual areas of activities, usually these areas also correspond to organizational structures, but this may not be the case, so we used the description of an area. Each activity requires or causes certain financial costs, which are in individual areas divided into three groups: the cost of specific activity (marked with a symbol "a"), internal losses caused by incorrect practice of the activity, resp. failure of performance of this activity (marked with a symbol

"b"), and external losses that occur only after implementation, such as complaints, etc. (marked with the symbol "c"). Financial expenditures on quality can be then expressed as follows:

$$QC = CRD + CD + CO$$

In other words: financial costs of quality represent the sum of financial expenditures on research and development, on retaining existing customers, and on acquiring new customers. This quality cost model differs from the current understanding in a way that quality costs have till now represented the financial costs on the poor quality in the production process. Our model, on the other hand, is based on the knowledge that if all the organizational structures of a company are involved in quality assurance, then in these structures also incur the quality costs.

## **5. DEFINITION OF ACTIVITIES IN INDIVIDUAL ORGANIZATIONAL STRUCTURES TO ASSURE QUALITY**

As in individual companies the organizational structure corresponds to the conditions of a given company, it does not state activities for organizational structures, but for areas of activities. For each area of activity, the financial costs for the activity concerned and not the activities of creative quality management are reported directly. However, each cost item represents a financial cost for the activity being carried out in the area concerned. For each area it is stated to which group of costs and activities the respective activity belongs. While, needs to be emphasized that there are not named all activities of certain area but only those related to quality.

Area of marketing (CD, CO)

- (a) costs of marketing analysis of competing companies products, the development of competing firms' technologies, the development of customer requirements, the costs of verifying the predicted materials, costs of participation in the qualification of new technologies, costs of assessing the concept of new products under development.
- (b) costs on repetition of studies as a result of the defined system, costs on participation in modification of the concept of proposed new products, costs on repetition of marketing studies due to contradiction in the concept of new products, costs of changes due to changes in material orders.

Area of Research and Development (CRD)

- (a) costs of participation to verify the concept, to decide the suitability of the proposed technology, to implement modifications to designs, to participate in sample checks, to homologate suppliers, to standardize measuring instruments, to analyze laboratories, to assess requirements on stuff.
- (b) costs to repeat technical studies, participation in trial testing, costs on repeated technical studies due to existence of inconsistencies in products, company standards, costs of participation in complaints, costs of rejects evaluation, costs of purchase of unnecessary materials, etc.
- (c) costs of the repetition of technical studies after the first delivery of a new product, participation in the handling of complaints at suppliers, participation in after-sales services, etc.

Area of material assurance (CO)

- (a) costs of initial inspection, participation in the evaluation of suppliers, the assessment of purchased materials, inspection of the storage of material, audits at suppliers, participation in the inspection of invoices and accounts, participation in destruction controls.
- (b) costs for resolving problems with suppliers, costs of repeated control of inputs, resolving supply errors, rejects in supplies caused by mistake, repeated control of non-compliant supplies, costs on additional transport of trucks in case of delay, lost time in repetitive operations, loss of supplier in case of his withdrawal , delays in performing tasks.



- (c) costs related to changes in orders due to errors, repetition of deliveries in case of supplier's errors, costs related to the preparation of new orders, transport costs in case of complaints at the supplier, transport and personal costs in negotiations with suppliers, costs of post and telephone contact, etc.

Area of production (CD)

- (a) costs of technical documentation control, production and intra-process control, control in laboratories, homologation, participation in product and production process audits, maintenance and calibration of measurement tools, participation in prototype production, verification of machine features to comply with stated tolerances, verification of instrument capability, production storage, storing rejects.
- (b) costs of losses from rejects, handling of rejects, fixing of repairable rejects, preventive measures to avoid rejects, additional control of repaired rejects, in case of breakdowns, costs on recovery of the production process;
- (c) loss of time in case of equipment breakdowns, accidents and misfortunes in the manufacturing process, costs of removal of deficiencies in the production process, costs of removal of deficiencies in the case of complaints.

Area of after-sales activities (CD), (CO)

- (a) costs of negotiations with customers prior to the conclusion of the contract, advertising advance sales, documentation completeness control, delivery control, shipments, invoicing, works connected to warranty repairs, provision of technical services to customers.
- (b) registration of incorrect and non-compliant deliveries, repetition of administrative works on defective deliveries, costs related to work with rejects which pass the final control and are claimed, costs associated with revision of contracts due to defective supplies, costs associated with revision of technology documentation, commercial contracts, etc.
- (c) costs related to warranty repairs due to defective deliveries, non - invoiced activities, penalties for non - compliance with delivery deadlines, costs related to repairs of products after the warranty period, if they are accepted, costs to provide customer feedback, etc.

Area of quality assurance (CO)

- (a) costs of control for internal documentation about product quality, production process control, products control, statistical regulation, prototype control, costs of metrological assurance and calibration of measuring instruments, audits of suppliers
- (b) costs of control effectiveness analysis, analysis of rejects causes, development of quality assurance plan, training of personnel in the field of quality assurance, analysis of warranty repairs
- (c) losses due to products non-conformities leading to the loss of the customer

Area of personnel assurance

- (a) costs related to control of jobs definitions and responsibilities, audits of personal development of employees with a focus on quality, setting up a motivation system for assurance of quality, to control compliance with the practical employee hierarchy, to control the quality of social information
- (b) costs of control the rotation of workers, the economic impacts of absenteeism, the economic impacts of lack of employees, social audits, assessment of remuneration in proportion to the functions held
- (c) costs of external consultants, service organizations in case they represent certain functions, costs resulting from accidents at work.

The above cost structure and costs of quality cannot be understood as a model that can be used in any business. It is only a methodological tool which should indicate that costs of quality arise in every organizational structure and each organizational structure must be involved in quality assurance. The structure of these costs depends on the specific conditions of the company, its production program, size, etc. On the other hand, each organizational structure should have an analytical record of these costs,

which would allow the assessment of return on quality. This brings us to measurement of the return on quality. Assuming that the company has developed the above mentioned analytical evidence of quality costs, it is possible to define and measure the return on quality. Each indicator of return represents the ratio of profit to costs. This indicator of return will be referred to as the RoQ symbol (Returns on Quality). RoQ is the ratio of company profit to quality costs as defined in the previous section of the paper. Analogously, we can also express partial indicators reflecting the effectiveness of research activities RoCRD, the efficiency of costs to retain current customers RoCD and the efficiency of costs to acquire new customers RoCO. These indicators have no informative capacity, as for profit generation there is involved large number of other activities and not merely costs of quality.

On the other hand, these indicators have a great predicative ability if they are used in time sequence. If we compare e.g. the RoQ indicator for the monitored year with the indicator for the previous year if the costs of quality are efficient, the value of this ratio must be greater than 1. If it is less than 1 it means that the costs were used inefficiently, which means there are present losses in the area of quality. A similar interpretation is also applied to the indicators of the effectiveness of research resp. development activities RoCRD, even for cost indicator to retain current customers, if this ratio is less than 1, it means the loss of current customers. If this ratio for cost indicator of new customers acquisition is less than 1, this means that costs in this area are not efficient. Such evaluation does not only speaks about quality, but also about the level of quality management, but also about the level of business management as such.

## 6. CONCLUSIONS

Small and medium-sized enterprises represent very important part of the domestic gross margin and their profitability is reflected in the overall prosperity of the country's national economy. Therefore, it is very important that the investments made to build the quality management system at the level of SMEs are reflected in their positive and balanced balance sheet. In the course of 2017, the Government adopted two important documents for improving the business environment - at first it approved the Proposal of Measures to Improve the Business Environment – as so called I. anti-bureaucratic package of measures, to creation of which the Better Regulation Center, within the working group of Doing Business, contributed with 60 concrete proposals for necessary changes. Subsequently, the Ministry of Economy of the Slovak republic (MH SR) prepared and the government approved the document RIA 2020 - Strategy of Better Regulation. Based on statistical and other data, the Slovak Business Agency regularly monitors and evaluates indicators related to the business of small and medium-sized enterprises. These data complete analysis from various areas of the economic environment in Slovakia, which map the status and trends, which are theoretically but also statistically less examined, and these findings are also presented in comparison to abroad. However, their findings are not based on indicators that would also monitor and evaluate the economic aspects of quality management.

## REFERENCES

1. Linczéni, A & Nováková, R 2000, *Manažérstvo kvality*, 1.vyd. STU, Bratislava
2. Hrubec, J, Virčíková, E & et al. 2009, *a kol.: Integrovaný manažérsky systém*, Slovenská poľnohospodárska univerzita v Nitre, Nitra
3. Nováková, R 2013, *Konkurencieschopnosť – marketingová stratégia malých a stredných podnikov*, monografia, KON-PRESS, Trnava
4. Normy ISO 9001:2015
5. Správa o stave malého a stredného podnikania v Slovenskej republike v roku 2017