

CONTROVERSY AND ASPECTS OF QUALITY COSTS MODELS

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ABSTRACT

Theoretical approach and experimental learning are both reliable sources for studying how total quality management is working, and especially which tools are most effective in business management. In order to bring some light in this regard, this paper brings to light a set of tools identified within an empirical research, conducted in one significant IT multinational company that operates in Romania as well. Since large multinational companies are gaining constant margins and competitive advantage on long-term, we consider it as a proper case study for conducting a quantitative research. In terms of legal or regulatory requirements, quality models are not described as compulsory tools in any organization, neither public, nor private. Despite this, private companies developed and used these models as imperative methods for an effective management process. This paper is transposing the theoretical approach into a research that is testing how these theoretical issues are working in a real business environment. The results indicate an incomplete approach of these models by the managers of analyzed company. Nevertheless, there is still an orientation to a philosophy of qualitative management process, through a different path, conducted by some of formal and informal leaders.

KEYWORDS: *management process, quality cost model, total quality management*

JEL CLASSIFICATION: *L12, M10*

1. INTRODUCTION

Considering the contribution of the quality management including controlling quality costs will be helpful for every large company to better understand its' structure and workflow. The goal of this paper is to leverage relevant theoretical opinions regarding organizational structure and elements, and cost quality cost models as well, so that there can be accomplished a debate on how total quality management could be submitted among a large company. Cost of quality has always been an issue among companies and public institutions, notably because of the transmutations brought by the EU free market and globalization process. It is considered that the impact of free market is substantial higher on countries that joined free market structures, namely poor countries (Cate, 2009). In the case of Romania, joining the EU in 2007 was a starting point for accessing knowledge and practices in a free environment, therefore a large number of SMEs imported intellectual capital from other companies and public institutions, especially in terms of management process (Scarlat & Scarlat, 2007).

In terms of case study, the authors decided to approach Microsoft Romania, this company having a proper number of employees and adequate organizational structure for collecting relevant information. Examining Microsoft Romania is a pertinent demarche since the analyzed company leads an industry and brings from the US a set of knowledge and best practices for other small

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companies, even in different fields. As talking about large companies from the US, it is considered that the EU imported a high amount of knowledge from there by innovative techniques provided even by large companies from the US (Pedersen et al, 2000). In this scenario, it is clear that most of quality cost models have been imported through this path and implemented in companies that were having long-term connection with the US enterprises. Leading with these assumptions, this is the source of the most quality cost models used in top-management and therefore exposed in this paper. For covering as many quality issues as possible, it is strongly recommended to firstly analyze the design of organizational chart, organizational posts, positions and eventually jobs (Nicolescu & Nicolescu, 2011). First, the organizational structure refers to all human resources enrolled in various structural units ranked. It includes two overlapping sub-levels hierarchical levels as command structure and execution structure. The first structure includes command reporting lines and the other one includes execution reporting lines. The organization has the purpose to show in a graphic way the organizational structure. Second, the organizational posts are seen as the easiest and indestructible organizational division. The person, which the principle task is to lead a group of people grouped in various structural units (Popa, 2004), is called *Manager*. The manager position refers to decisions about other people's work and tasks are grouped into specific management attributes. The *Lead Position* does not concern the work of other (House & Aditya, 1997) and the profile is to ensure work processes typical of certain jobs. Least but not last, the positions and jobs are designing the functional structure (Nicolescu & Verboncu, 2008), which identifies all types of functions (management positions) and trades (positions execution) necessary for performing different activities. For each organization chart we can emphasize the structure of employment by establishing state functions and specific trades which shows the types of posts and their number.

2. THEORETICAL APPROACH

Taking into consideration all these aspects on how organizational structures are including quality costs, this section of the paper aims at exposing some evolved tools used in contemporary management systems ran by large companies. Before providing that glimpse into management systems, the authors reflected on basic definitions concerning at organizational elements, following that subsequently to step forward to quality costs models.

2.1 Organizational elements

First element that is creating impact on organizational management is the relation between different or similar entities within an enterprise (Kraut et al., 2002). These relations may be included in a wider concept, namely functional structures (Morgeson et al., 2010). Functional relations represent the relationships between organizational divisions, established reports determined by specific participation of each compartment to operate and conduct business activities. Relations are divided into three categories: *authority relationships*, which mean that the "distribution" of power in the organization is regulated, *direct cooperation* relationships between departments which are located differently, *control relationships* where the performance is measured for each department.

Beside the functional relations, there are regulatory issues that have to be accomplished according to labor laws, in order to avoid any judicial conflicts between employer and employees. In this regard, enterprises are dealing with so called employment contracts. The impact of these contracts is really strong as employees are strictly linked to stipulated benefits and responsibilities (Chivu et al., 2013). The company promotes a collective agreement with its employees. Each employee signs an individual contract of employment where the job description is. The pay scale is set wage levels and values correlate with the types of posts and their classification in different regimes of complexity and skills.

Bearing in mind the basic organizational element, such as employment contracts and functional relations, next steps are following the path of procedural structures. These are considered to be

interactions between those who are planning and those who are planned (Hartileb et al., 2005) to apply managerial decisions. In regard to *organizational processes*, we can consider four fundamental processes: strategy (business success for medium and long term developed by the organization), product (features and attributes necessary to use expected customer and other stakeholders), process (achieving competitive in terms of cost, time and quality) and system (systems and resources to develop intended business). Regarding to product linked issues, most valuable concepts occur on *product realization process*, which is the process of creating a product contains separate operations, successive or simultaneous, necessary for the creation and distribution of value (Doepker, 2001).

On the other side, when talking about adapting processes to specific manufacturing processes, there arises the issue of *operation transformation proceedings*. A process of transformation is the progress of the actions provided for changing inputs in outputs. How can be this change divided into successive or simultaneous component? We consider that an operation transformation understand that process of transformation indivisible component of a secondary process. Thus, each stage of the process is a secondary operation. Each task is carried out in phase component, so that an operational phase is a sum of systematic activities carried out under and within a specific system (Kumar & Suresh, 2009). An operation environment is the environment in which actions are provided. Hence, procedural environment is ultimately a certain amount of media clippings organizational systems. Each action component of phase takes place in a certain component of a particular work center cost center. Therefore, a secondary process operation will run sequentially or simultaneously in different work centers, which belong to a particular cost center. It is quite possible that a trial operation to produce resource consumption in different cost centers of organization.

2.1 Quality cost models

Considering almost all relevant organizational elements as discussed, in order to provide more relevant information, theoretical approach exposes in this section which are most suitable quality costs models for large companies operating in Romania. This section represents a collection of best practices provided by pertinent researchers within this area.

Starting with *PAF model* (prevention, appraisal, failure) is criticized because of the prescribing of a strictly positive optimal proportion of defective products (Vaxevanidis et al., 2009), and it's in opposed of "Crosby" (1979) and Deming (1982) thinking. They were arguing on the fact that in reality there are products that have high quality with less cost. According to the literature, the model defines three areas: the improvement, the indifference and the perfectionism.

Another quality cost model might be considered *Zero-Defects model*. After 20 years, Kume (1985) and Schneiderman (1986) criticize the PAF model, mentioned above, which lead to the development of the Zero-Defects in the optimal point of 100% compliance. Hence, the model supports the idea of the marginal contribution law that is not economic to invest beyond the minimum total cost, but does not want to stop in investing in quality and to deliver to the customer products with a certain share of flaws. Some of the authors have criticized the PAF model: Edmons (1991) - This model cannot explain the economic aspects due to the quality of the various stages of development, and Carr (1992) emphasized the intangible costs associated with the quality showing that the shape of the curves moves towards to another point of intersection.

Also the *Data model* criticized the PAF model for the reason that the critical data axis scale does not allow a useful representation. Through time the quality varies, and the curves cannot have an obvious link between the values of the two axes. The model involves the categorization of the quality costs sequentially in time, and tracking their trends. It can be seen the magnitude of these costs and their relative proportionality in time. It also can be seen the increase or decrease of trends of the costs with nonconformities and then how to reduce compliance costs. By involving the time variable, we are introducing the idea of a slower response effects of a quality control costs.

Now that there is established a clear vision of existing models from the theorists and practitioners point of view, we have decided to develop a quality model which will influence an entire various factors existing in the environment. With the influence of lost opportunities, we consider the model that assesses resource opportunities because slaughter most advantageous opportunities. Another costs induced sectors is representing by resources and over quality immobilization product. More than that, outsourcing is pushing more influence in whole equation. This model suggests a broader approach and that's why we take into consideration simultaneously the whole process of implementation and consumption of desired and undesired products.

Influence of variability might be consistently in every model described above, if managers are not focusing on the risk of variability. The only concern on variability is to reduce the costs of achieving quality characteristics. The basic idea is that the variability characteristics produce unwanted and unexpected results.

Another important aspect is the strategy developed cost reduction quality. We considered the following strategies: motivating improvements due to the effects of removing defects, motivating quality improvements due to strategic effects, strategic planning, quality, early removal of errors.

To analyze the relationship between costs and quality organization, we analyzed the structure of the organization, resources, organization and control of the organization. So, as we all know, the organization works with a number of different support systems designed to process different specialized resources offering specific outcomes necessary for other systems or direct internal processes of creation and distribution chain value and competence of an organization lies in its ability to support the coordinated deployment of resources required in order to achieve objectives. So, we can divide the organization into three key issues: allocation of tasks, distribution of authority and information flow.

With regard to the resources of the organization, we determined that the organization uses three basic types: assets, capabilities, knowledge and control of the organization. From our point of view, it is a system that has as mission control to inform decision-making system to activate and focus resources involved. Control organization allows managers to determine the state of resources and performance of individual or group. Also consider important information system and noted that it provides specific data about the effects produced results, the most useful data sources emphasize: the market mechanism, the mechanism results bureaucratic mechanism, cultural mechanism.

The major contribution that we bring in is the introduction of incentive, which we consider important in the analysis of the organization's control as it relates to actions by rewarding or punishing motivation. An organization can reward in two distinct ways: financial and non-financial (promotional title glory, or informally through praise, highlights management).

Measuring quality costs can be made through the data: relevance of data, simplicity of data, data sensitivity, data accuracy, economy of data. Cost data sources are: financial and accounting system, production system, the system of non-compliance, system improvements. According to some authors opinion (Khan & Sufyan Beg, 2012), *'one of the fundamental tenets of modern quality management is that quality should be planned, designed and built in – not inspected in'*. From this perspective, cost of quality should be evaluated ex-post, rather than ex-ante.

In the regard of collection of quality costs, we identified four collection methods: cost element method based on categories of quality costs, cost element method based on time, cost element method based on organization structure, the method based on cost analysis process.

To analyze quality costs we have identified several types of analysis. Quality costs alone are not only to illustrate what is spent in various areas relative to quality and show opportunities for improvement: analysis of long-term total cost of the allure and is useful strategic planning and monitoring overall progress; is pursuing high goals, the organization, analysis of short-term is prepared for each area of the organization where they set individual targets for improvement; short-term need to review the system of quality costs to help us find the root causes and remove them.

3. CASE STUDY

In this section we are exposing a case study conducted within Microsoft Romania, in regard to quality cost methods, especially for identifying how managers and employees perceive quality cost and total quality in their current work. In order to accomplish the research methodology, we considered that Microsoft Romania is a company where employees and managers are having an organizational culture that promotes group and individual performance, both harmonized with markets' requirements. US companies are having a strong presence in Romania and especially in Bucharest, IT field being one of the most active in this regard: IBM, Oracle, HP. Bearing all this in mind, it is clear that there is a strong competition in achieving market share for long-term, and that is possible only by building internal competitive advantage towards main competitors. We consider Microsoft as the most appropriate example in this case study, since on a global approach, Microsoft is leading the software industry in terms of operating systems and office applications. More than that, Microsoft is one of the most active companies in the world, not only within IT field. Also, the availability of data did not represent an obstacle for this paper, as managers from Microsoft seem to provide information to academic researches, once they are part of academic projects such as Microsoft Academy, ran within The Bucharest University of Economic Studies.

The research involved a survey on approx. 80 employees and 7 managers from various departments and hierarchical levels, both from Romania and CEE (Central and Eastern Europe) offices. The survey was conducted by printed questionnaires and videoconference, designed in the thought of covering every group of respondents. We considered ten relevant affirmations for this survey, all of them targeting specific issues related to total quality management and quality costs among Microsoft Romania. The scale of answering is Likert 1-5, without meaning association, in order to avoid any directing bias for respondents. Interpretation of Likert scale is: 1 – the company has no capacity/focus/resources and 5 – the company has high capacity/ focus/resources/commitment for accomplishing the sense of that affirmation.

When designing the case study, we considered the Balanced Scorecard model, since this is aiming at analyzing issues such as financial, internal processes, organizational capacity and customers' satisfaction. The priorities set by this research consist of gaining glimpses about how Microsoft's staff is perceiving total quality management by these four core dimensions of every mature business. Knowing some insight from the activity of Microsoft, such as strong usage of training tools, quantitative measuring methods and collaborative instruments, we built the survey in a comprehensive manner, aiming at covering relevant aspects, but avoiding a time-cost approach.

Also, the research is considering some certain facts that are already implemented in Microsoft, both worldwide and national.

By this survey, we tested how Microsoft, as organization, perceives various qualitative factors, such as:

- design of processes, particularly how top-management is establishing the workflow;
- leveraging in-house intellectual capital and expertise for improving internal processes;
- improved communication and usage of collaboration technologies in an ergonomic shape;
- information management as a central leverage for effective project management. This also includes informational flows through;
- utilization of data by using innovative reporting structures and templates, extracting information and knowledge by exploiting data mining solutions in various activities (HR, financial, accountability, marketing);
- investments in training and long-term education programs, succession planning;
- enhancing the power of top managers to speed the ROI and strong financial reporting;
- effective risk management within organizational changing process.

3.1 Results

Table 1 is exposing the affirmations disposed in this survey, as collected within the survey and explained in further paragraphs.

Table 1. Questionnaire and results

No.	Affirmation	1	2	3	4	5
1.	Top management team is committed to fast adapting for maximum profitability, within the imposed constraints, by an official document basis.	3%	6%	11%	38%	42%
2.	Some of managers are considered as "sacred cows", or there are departmental silos, and empire building which can avoid evaluations.	38%	32%	19%	9%	2%
3.	The system of measuring hard costs is more easy to use than using a system for soft expenditures, such as employee satisfaction, customer's losses, supplier's losses, CSR aspects.	6%	9%	21%	39%	25%
4.	Every measurement method (KPIs, stock outages, productivity, profitability, etc.) used by managers is correlated to Cost of Quality methods.	2%	6%	11%	34%	47%
5.	In terms of measurement system, me and my work colleagues feel a difference between COQ and traditional management.	12%	14%	27%	33%	14%
6.	The company's management is having a time pressure in order to implement COQ tools.	2%	8%	18%	36%	36%
7.	Internal software solutions are matching the requirements of implementing COQ.	2%	7%	22%	29%	40%
8.	I often receive feedback forms from customers, even I am not directly working with them.	9%	18%	29%	21%	23%
9.	Once a project is launched, I receive a various training offers in order to accomplish that next project.	5%	5%	16%	45%	29%
10.	My managers are providing proper tools for me in order to retain me as a long-term employee.	4%	7%	28%	33%	28%

Source: made by authors

The results are confirming the initial hypothesis derived by how consumers perceive Microsoft related to IT solutions and support services. In other words, we led this discussion taking into consideration the positive financial reporting that Microsoft exposed as world-wide company in IT field. More than that, we appreciated that Microsoft as world-wide company will transfer some of its know-how and intellectual capital towards branches from Romania and CEE. Focusing on same scale mentioned above, there is almost clear that our hypotheses are confirmed by respondents' answers, since they are involved in the daily business with full-time responsibilities.

3.2 Discussion of Cost of Quality in Microsoft

For every affirmation exposed in Table 1, there are some interpretations that should be exposed as relevant for this study. For every major component of organizational structures, Microsoft Romania is having an effective approach, with some little exceptions. Considering the percentage of positive answers, it is almost clear that both employees and managers are displaying a friendly attitude towards total quality management within the organization. Also, since the discussions and the

questionnaire was focused mainly on total quality management among Microsoft Romania, the answers and results are exposing some new glimpses from how quality cost is used as a business philosophy in this case.

The first affirmation is a general one, and highlights a general perception upon total quality management from executive level to managers. Since 80% of respondents indicated the level 4 or 5, it is clear that top managers from Microsoft Romania are part of this organizational changing process for, at least by the message spread within employees. The second affirmation indicates that mainly every person from Microsoft is part of the evaluations and in a unitary manner. It is a reality the fact that in most of the SMEs and also large companies from Romania there are a lot of examples of 'sacred cows' who are avoiding appraisal and tests, year by year, without any possibility to change that. This is happening mostly because of organizational culture that is not performance-oriented, but individual-oriented. In this regard, the example of Microsoft is a clinching one, with a high percentage, 70%, of answers that indicate 1 or 2. Still, 30% of respondents perceive that these 'protected' employees or managers do exist within the company, but this percentage might expose that the evaluation process is having weaknesses towards some categories of employees.

The third affirmation is another way to extract the business philosophy by analyzing how managers are grading the soft expenditures comparing with other 'hard' costs. It is important to know if managers are able to implement cost of quality models by understanding their attitude related to soft expenditures, since intellectual capital is such a cost. If the managers would show scarcity in considering intellectual capital as something unnecessary, within the company would occur prerequisites for delaying the implementation of total quality management. In our case, the situation is a good one, not perfect, as 64% of answers indicate that managers are paying high attention on soft costs, not only on traditional and hard costs. More than this, we indicated some particularly examples of soft cost, in order to eliminate any confusions about the terms meaning. The next affirmation is completing the previous one, by identifying some specific tools and how employees perceive that these are correlated with cost of quality principles. In this case, the positive answers were more, with 81%. In this case, we indicated that they should analyze only those measurement tools that are already working in the company, not those they would like to use.

Next affirmation links the other two previous affirmations with a complex image, namely a global evaluation towards the whole management process. For answering to this affirmation, respondents should be aware of what exactly means every managerial system indicated in the questionnaire. Only 14% of them indicated the maximum level, 5, as a mean that either they do not understand exactly how is working the cost of quality as an exhaustive management process, either they do not feel that difference between these concepts. The distribution of answers is very spread in this affirmation, having in consideration the same two reasons. Another hypothetic reason might consist of the change resistance to a completely new management approach. In the following affirmation, we wanted to highlight the time as a variable in cost of quality implementation. In a company that is implementing the system of cost of quality, time is a very stressful variable since the length of implementation is influencing the results of whole process. 72% of respondents indicated 4 or 5 at this affirmation, which indicates a pressure maybe from headquarter in this regard. Of course, this might be determined by the local competition with other large IT companies.

The seventh affirmation is extracting an interesting fact from internal processes, as Microsoft is a leading company in IT&C. "Only" 69% of respondents indicated that their organization is having proper IT tools for their internal processes. These processes are part of long-term strategy, implementation of new procedures, design of new rules, market analyze and also business development. These results indicate either a lack of software tools within the company, either very high expectance for IT tools, that should maybe able to work alone. Still, only 9% of respondents are revealing a low and very low level of software development in internal processes.

The next affirmation is related to another soft element, namely customer's satisfaction. The affirmation wants to identify if there exists any kind of information from any customer to every employee. Despite the fact that there is a divided work-flow in some departments within Microsoft, and only some of employees are having direct contact with customers, it is really important to inform most part of Microsoft staff should find the level of satisfaction for customers regarding services and products. At this affirmation, the answers are also spread, since 29% indicated 3 and 44% indicated 4 or 5. Also, 27% of respondents indicated 2, meaning a large number of employees that do not receive any information about customers' satisfaction. These results are highlighting the change resistance, as in traditional management approach, only some employees are having access to this information. Moving to the next affirmation, we thought about the same Balance Scorecard approach, and identified some insights related to professional development. In a particularly example, namely projects, 74% of respondents showed a very good support from managers, in order to use effective work during any project. This hypothesis is confirmed in a rapid way, as Microsoft is globally known as a project-oriented company, most of its products represents a final result of a project.

The last affirmation is also concerning about employees, especially about how manager are planning a long-term career for employees. Of course, the focus is directed to those employees that are having consistent results in terms of work and ROA (Return on Assets). For this affirmation, 28% of respondents indicated that they receive real support and tools from managers in order to build a long-term career in Microsoft Romania. Also, 33% of respondents indicated value 4 at this affirmation, as a proof that Microsoft is having this long-term orientation towards valuable employees. All the reasons for this positive attitude is linked to financial issues, such as: cost of trainings for new employees, cost of research and recruiting new employees, and the added-value suffered by losing important employees.

4. CONCLUSIONS

This paper exposes a study conducted on a large global company, particularly on its local branch, a study that is highlighting a current concept in many enterprises. Cost of quality, as part of total quality management involves an exhaustive approach in terms of management and organizational culture, and connotes usage of quality models for improving processes, internal communication, communication with customers, design of responsibilities, strategy building and implementation. For each of these, implementation of quality models is compulsory since Microsoft is part of a global network and intends to keep its leading position. We analyzed if employees and managers perceive any quality model in recent transmutations provided by top managers in a daily basis activity. The risk of facing a high change resistance is quite big in a company that deals with more than 500 employees. However, the IT field forces any company to innovate and to bring new products and services, otherwise the exit from that market is mostly sure.

Using a questionnaire, we collected the opinion of almost 90 employees and managers and tested the hypothesis according to which Microsoft Romania is having a positive orientation towards total quality management and qualitative models. Most of the collected answers confirmed the fact that in our case study top managers and middle managers are providing a new approach in the whole management system. We analyzed more organizational aspects thought as relevant, similar with the model of Balanced Scorecard. Cost of Quality might be easy to reveal only if there are effective Key Performance Indicators associated with responsibilities and tasks. We tried to extract these insights from respondents, by asking to indicate how much they feel that Microsoft is having the capability to provide those key elements. As exposed in Table 1, most of answers reveal a positive attitude and approach regarding the cost of quality issue and the implementation of it within Microsoft Romania. The most noticeable elements already implemented are related to evaluation processes, support for professional development and measurement methods.

Considering all these, this study demonstrates one more time that large companies, global companies are following most valuable trends for leading wide activities. The most important in all this cost of quality story is that Microsoft Romania is concerning about every element, not only those involved in production and selling, as most of local SMEs are doing. Still, there are some lacks in the whole management systems, as the change resistance seems to exist in all this. The main reason for this might be considered the gap between Romanian branch and US branches for example, regarding the organizational culture.

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