MANAGEMENT OF QUALITY RELATED COSTS. THE CASE OF PORTUGUESE COMPANIES

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Abstract
The traditional view of quality related costs (QRC) tries to justify investment in prevention as a way to reduce the costs of failure. But this static view must counter a more dynamic vision that fosters continuous improvement and assesses the costs and benefits of implementing techniques and methods of quality management, such as certification of ISO 9001 systems.

However, it is unknown whether such companies are also engaged in the management of QRC, arising from activities undertaken, either at the level of monitoring, or coming from failures, and if such organizations verify (or not) the recovery of investments in quality. In this sense, the present article aims to provide insight into the procedures adopted by Portuguese companies in managing QRC, and to assess the extent to which management reports allow the analysis of quality costs and contribute to the related planning and control activities.

The results of this study showed that there is hardly any assent to the implementation of formal mechanisms for planning and control of QRC, and to the explicit identification and segregation of those costs in management reports.

Key Words: Costs, Quality, Management, System

Categorize: Research Paper

1. Measuring and Evaluating the Quality Related Costs

Lopes and Capricho (2007) warn that the costs of poor quality are barely visible in companies, which do not give them much importance, insofar as they are derived from the sum of large amounts of small deviations, which become a real iceberg of hidden costs where the visible portion may be the least important.

Gross margin and operating income grow whenever the quality system eliminates the costs of poor quality, to a greater extent than the total costs required for such a system to work and be effective (Crosby, 1994).
On the other hand, Robles Jr. (2003) argues that, by reducing waste, the company can generate resources to leverage its quality improvement system and consequently the return on investment in quality would be obtained primarily by reducing waste.

The traditional view of QRC tries to justify investment in prevention as a way to reduce the costs of failure (Figure 1). But this static view must counter a more dynamic vision that fosters continuous improvement and assesses the costs and benefits of implementing techniques and methods of quality management, such as the certification of ISO 9001 systems (Figure 2).

![Figure 1 – Traditional View](image1)

![Figure 2–Dynamic view](image2)

Referring to the importance of QRC, Pereira e Ganhão (1992:91) state that “the cost of quality is the resulting cost of making poor procedures”. It is a type of measurement that turns mistakes into monetary units and has a huge impact in organizations, especially in management. For these authors, the management of QRC makes it possible to determine the benefits of remedial and improvement actions (AECA, 2003; ASQC, 1986; Sellés and Carbonell, 2002).

Table I presents the model for determining the Total Cost of Quality, according to Bank (1998), where Quality Costs + Non Quality Costs = Total Cost of Quality.

### Table I – Total Costs of Quality

<table>
<thead>
<tr>
<th>Total Costs of Quality</th>
<th>Quality Costs</th>
<th>Non Quality Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Costs of the product characteristics</td>
<td>Costs of defects and their resolution</td>
</tr>
<tr>
<td></td>
<td>Costs of excessive client demands</td>
<td>Internal failure costs</td>
</tr>
<tr>
<td></td>
<td>Prevention Costs</td>
<td>External Failure costs</td>
</tr>
<tr>
<td></td>
<td>Evaluation Costs</td>
<td>Missed opportunity costs</td>
</tr>
</tbody>
</table>

Source: Adapted from Bank (1998)

In this sense, prevention costs are the costs of the action taken to prevent the occurrence of faults/errors/non-conformities and evaluation costs are the costs of determining the level of quality achieved by the product/service (Pereira and Ganhão, 1992; Ganhão, 2001; Camaleño, 2006; Calderón and Novas, 2009). On the other hand, costs resulting from failure are costs related to the occurrence of defective units/components identified within the organization or outside it already. Failures can be divided into internal and external faults (Villar and López, 2003).
Internal failure costs are the result of the inability of a product or service to meet the quality requirements before its supply; external failure costs are those resulting from the inability of a product or service to meet the quality requirements after its supply, that is they reflect the expenses arising from issues identified outside the company (Shank and Govindarajan, 1997; Silva, 1999; Wernke and Bornia, 2000; Carvalho and Paladini, 2006) (see Figure 1).

In this regard, António and Teixeira (2007) report that the underlying principle is that investment in suitable quality planning and prevention activities can lead to a substantial reduction in the cost of internal and external failure and even evaluation costs. These authors also point out that increased spending on prevention is intended to diminish or even negate the other types of quality costs (see Figure 2).

Carvalho and Paladini (2006) state that the quantification of QRC allows the organization to identify not only losses arising from problems, but also to quantify that investments in prevention have achieved the expected result. It also indicates that the systematic collection and analysis of quality costs enable the organization to verify the behavior of these costs over time.

From this perspective, to Robles Jr. (1996, 2003), the quantification of quality through QRC, is seen by administrators as a way to achieve several objectives, among these are:

- The evaluation of quality programs through monetary and non-monetary quantification;
- The possibility of setting targets for quality programs, assigning priorities, through the Pareto method, to those who may obtain better results for the company immediately;
- To accurately understand, how much the company is losing due to lack of quality, raising the commitment of management to meet the challenge of improving quality;
- To understand the distribution of costs among different categories of QRC, which allows direct investments in accordance to quality improvement projects;
- To promote quality as a strategic aim for the company, involving top management through effectively quantifying monetary and non-monetary (physical), and ensuring their commitment to quality;
- To improve quality to obtain increased profit without price increases and significant additional investments in facilities, equipment and human resources;
- To increase productivity through quality;
- Assess the suitability of the maintenance program, as delays in the maintenance schedule can affect the level of quality of processes and products;
- To systematize the knowledge and influence of the different consequences of lack of quality in the company, such as sales returns, cancelled orders, changed, and especially non-placed orders, and other billing errors;
- To really understand, how much the company has been investing in the different categories of quality costs;
- To therefore infer how much the company should invest in the different categories of quality costs;
- Set objectives and resources for staff training;
- To facilitate the assessment of the effect of quality on cost and value of products and services;
- Among others.

According to Crosby (1979), the purpose for calculating QRC is: to identify the price of non-compliance; to provide a basis to verify quality improvement.
However, according to Robles Jr. (2003), information about QRC alone will not lead to improvements in quality. Nevertheless, such information should be reviewed by top management, in order to consequently determine actions to improve quality. For these reasons, the author stresses that the control department must ensure the “quality” of information about QRC; capital costs can be omitted in their reports, while others may be included improperly (Jordan et al., 2002; Neves, 2004; Oliveira, 2006).

Sakurai (1997), cited by Souza and Collaziol (2006), while defending the usefulness of a budget plan for QRC, emphasizes that when the company wants to establish an effective target to control the activity of management, the costs of prevention and evaluation are good indicators for assessing performance.

2. Methodology

Problemand objectivestudy
The main objective of this research is based on empirical analysis of business practice relating to planning and control of QRC, in Portuguese firms certified ISO 9001.

Selection and characterization of the sample
The sample was selected from an accessible population consisting of 4512 companies, working in Portugal (Mota et al., 2008). In order to obtain the best representation, we used the method of stratified and systematic random sampling for selecting the sample. Of the total questionnaires (1131), 154 answers were obtained, which corresponds to a rate of 13.6%. This study looked primarily at seven variables, grouped into four groups (classification, budgeting, measurement, analysis, and management reporting of quality costs). Data collection took place between June and July 2009 and was developed through a survey, based on studies of Crosby (1994), Feigenbaum (1994), Tatikonda and Tatikonda (1996) and Souza and Collaziol (2006).

Variables in study
This investigation concerns the planning and control of quality costs, and addressed Portuguese companies certified by one of the ISO reference, covered 7 variables essentially grouped into four groups (classification, budgeting, measurement, analysis, and management reporting of quality costs) (see Figure 3):

- V1-Identification of quality costs in management reports;
- V2-Specific Reporting of quality costs;
- V3-Preparation of budget plans of quality costs;
- V4-Analysis of the actual performance of quality costs;
- V5-Investment control in quality;
- V6-Analysis of quality costs by category;
- V7-Using indicators of poor quality.

Instrument and data analysis
Data collection took place between June and July 2009 and was developed through a survey, embodied in an questionnaire comprising mainly closed questions, sent by post to selected companies, addressed to the person responsible for managing the quality system. Methodologically, the questionnaire was prepared in accordance with the study objectives. Before its final implementation, and according to Lakatos and Marconi (1991), the
questionnaire was subject to a pre-test, applied to six respondents with the desired profile for the research, whose companies were not part of the sample used in the study. Regarding content, and considering the objectives of the survey, the questionnaire was based on studies of Crosby (1994), Feigenbaum (1994), Tatikonda and Tatikonda (1996) and Souza and Collaziol (2006).

To describe and summarize the data characteristics that belong to the whole sample, we used techniques of descriptive statistics, with the use of SPSS software (version 16.0): The quantification of absolute and relative frequencies; An intersection of variables; tests of independence (Pearson Chi-Square) between the variables studied. In addition to this quantitative analysis, data was subjected to further analysis of a qualitative nature.

![Diagram](image-url)

Figure 3 – Variables of the Quality Related Costs

3. Findings

The vast majority (45.5%) of participants in this study were mainly small and medium manufacturing industry, according to the Portuguese industrial structure, IAPMEI (2008), which certainly influenced the responses regarding the planning and control of quality costs. The legal form of companies studied, were mostly limited companies (59.7%). The respondents were fairly balanced between females (80% - 52.3%) and males (73 to 47.7%) and mostly licensed individuals (107% - 69.5%).
The quantitative analysis showed there was little sensitivity to the impact of quality costs in total costs, as most companies in the study:

- Did not have a department responsible for issuing reports and analysis of quality costs because they found no advantage in either the creation of that structure, or because they were unaware of the benefits;
- Did not carry out classification of quality costs according to their nature;
- Nor classify quality costs by category and did not identify the QRC with missed opportunities;
- Did not show the costs of quality in management reports and did not identify the quality costs in the P&L statement;
- Did not prepare budget plans for quality costs;
- Did not carry out performance analysis of QRC;
- Did not establish relationships between QRC and other quality indicators;
- Did not control the investment in quality.

From the prior analysis of data and results, ten pairs of variables were considered, and possible relationships of dependence were sought. Initially, we crossed pairs of variables, all nominal and with two categories (Yes and No), corresponding to dichotomous variables. The first pair of variables considers the possible relationship between the explicit and isolated identification of QRC in management reports and the existence of specific QRC reports. From the results obtained, of the 145 companies considered in the analysis, 77 (53.1%) produced specific QRC reports. However, only 49.1% of these carried out the explicit and isolated identification of QRC in management reports. Though, only 4.4% of companies did not report specific QRC and carried out the explicit identification and isolation of these management reports—that is to say—that 95.6% of companies did not report specific QRC, did not proceed also to make them explicit in management reports and, on the other hand, 92.7% of companies that explicitly and separately identify QRC in management reports, also prepare specific reports of QRC.

Secondly, the possible relationship between the preparation of specific QRC reports and the preparation of budget plans for QRC was studied. The data obtained, in this case focused on 148 companies, showed that 52.7% of companies prepared specific QRC, and of these, 44.9% also prepare budget plans. On the other hand, 81.4% of companies prepare budget plans for QRC, also prepare specific reports of QRC. Finally, 88.6% of the 70 companies that did not prepare specific QRC reports, did not prepare budget plans also. Thus, it is permissible to consider the existence of a relationship between both variables.

The relationship between the preparation of budget plans for quality costs and the explicit identification and isolation of QRC in management reports was also analysed. The results showed that the majority (52.7%) of companies preparing budget plans for the QRC did not identify these types of costs in management reports. On the other hand, 51.2% of companies that explicitly identified and isolated QRC in management reports, did not prepare budget plans for those costs. Finally, a large percentage of companies which did not prepare budget plans for QRC, also did not identify QRC explicitly and in isolation in management reports. 56.3% of total companies were in these conditions, accounting for percentages near 80% in the respective categories.

We then proceeded to the intersection of variables relating to the preparation of specific QRC and the explicit and isolated identification of QRC in management reports with the variable relating...
to the analysis of actual performance of QRC. A first analysis of the data showed a large number of companies that did not analyze the actual performance of QRC, regardless of specific reporting on QRC. 100 companies were in these circumstances, representing 69% of the 145 companies considered in the analysis. On the other hand, 53.1% of companies had specific QRC reports, regardless of carrying out analysis of actual performance of this type of costs. The process concluded also that 51.9% of companies considered in the analysis reported on a specific QRC, and simultaneously carried out analysis of the actual performance of this type of costs. On the other hand, 92.6% of companies that did not prepare specific QRC reports, did not analyze the actual performance of quality related costs.

In regards to the relationship between the explicit identification and isolation of QRC in management reports and the analysis of the actual performance of QRC, the results show that 15.7% of the 140 companies considered in the analysis performed both actions, while 57.1% did not do any. Among the companies that explicitly identified and isolated QRC in management reports, 56.4% also carried out the analysis of the actual performance on these costs, while among those who performed this type of analysis, 51.2% also engaged in the explicit identification and isolation of QRC in management reports.

Next, we sought to investigate possible relationships between the control of investments in quality and preparation of budget plans for QRC. Specifically, we analyzed whether the fact that companies separately controlled (or not) investments in quality is somehow related (or not) with the preparation of budget plans for QRC. The intersection of the variables determined that 65.8% of the companies that controlled separately the investment in quality also prepared budget plans for QRC, and that 84.5% of companies did not control separately the investment in quality and also did not prepare budget plans, in this case, 62.8% of 148 companies in the analysis.

Considering the intersection of the variables related to the preparation of budget plans for QRC and the actual performance of this type of costs, 18.6% of companies in the analysis (145) applied both methodologies, while 58.6% did not apply any methodologies. Among the firms that produce budget plans for QRC, 64.3% also carried out analysis of the actual performance of QRC, while within the group of companies carrying out analysis of the actual performance of QRC, 60% also prepared budget plans.

Another relationship considered was the identification of QRC by category and the preparation of the respective budget plans of QRC. The identification of QRC by category considered the classification into prevention costs, appraisal, internal and external failure, as well as their aggregation in control costs (costs of quality) and costs in control failures (costs of non-quality). However, the analysis considered only companies that carried out the identification (or not) of the quality costs category, not distinguishing between them. The results showed that 45.9% of firms identifying QRC by category also carried out preparation of budget plans. Otherwise, 81% of companies preparing plans for QRC, also proceeded to identify QRC by category. In line with previous results, there are a large number of companies that did not prepare QRC budget plans, amounting in this case to 72% of companies considered in the analysis (150), of which, 63% did not identify QRC by category. Of relevance also was the percentage of companies that identified QRC by category, although budget plans were not prepared (26.7% of total).

Finally, we proceeded to the intersection of information concerning the analysis of the actual performance of QRC and the use of indicators of poor quality. From the data obtained was...
inferred the existence of routines in the use of indicators of poor quality by the companies surveyed (64.8% of total), although only 39.4% of these carry out analysis of real performance of QRC. However, a very large percentage (84.1%) of companies conducting analysis of the actual performance of WQRC used indicators of poor quality, which leaves open the possibility of important complementarities between both approaches. However, in only a quarter of the companies’ overall, the analysis of the actual performance of QRC in addition to the use of indicators of poor quality was identified, while in about 30% of companies neither methodologies were identified. About 40% of companies used indicators of poor quality, although did not perform analysis of the actual performance of QRC.

Assuming an $\alpha = 0.05$, an analysis of the relationship of independence / dependence between variables, was performed using the chi-square Pearson, considering the following assumptions:

H0: The variables are independent, ie, there is no relationship between variables.
H1: The variables are not independent, ie, there is a relationship between variables.

Table II summarizes the results of the chi-square, as well as decision taken in accordance with them.

According to the Pearson test of chi-square, the hypothesis of independence was rejected. This analysis was, however, complemented with a set of measures of association (PHI coefficient, contingency coefficient, C-Pearson coefficient, and Cramer's V), which, in general, indicated the existence of association between the pairs of the considered variables, with relatively high values of statistical significance.

Table II – Summary of the relationship of independence / dependence between variables, (Chi-Square Test; $\alpha=0.05$)

<table>
<thead>
<tr>
<th>Relationships of independence/dependence</th>
<th>Result</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification of quality costs in management reports vs preparation of specific reports of quality costs</td>
<td>$\chi^2(1)=35.958$ Sig. = 0.000</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Preparation of budget plans of quality costs vs preparation of specific reports of quality costs</td>
<td>$\chi^2(1)=20.018$ Sig. = 0.000</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Preparation of budget plans of quality costs vs Identification of quality costs in management reports</td>
<td>$\chi^2(1)=10.674$ Sig. = 0.001</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Preparation of specific reports of quality costs vs Analysis of actual performance of quality costs</td>
<td>$\chi^2(1)=33.553$ Sig. = 0.000</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Identification of quality costs in management reports vs Analysis of actual performance of quality costs</td>
<td>$\chi^2(1)=16.773$ Sig. = 0.000</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Separate control of quality investments vs Preparation of budget plans for quality costs</td>
<td>$\chi^2(1)=35.206$ Sig. = 0.000</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Separate control of quality investments vs Analysis of actual performance of quality costs</td>
<td>$\chi^2(1)=6.877$ Sig. = 0.009</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Preparation of budget plans of quality costs vs Analysis of actual performance of quality costs</td>
<td>$\chi^2(1)=30.544$ Sig. = 0.000</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Analysis of quality cost by category vs Preparation of budget plans of quality costs</td>
<td>$\chi^2(1)=23.332$ Sig. = 0.000</td>
<td>Reject H0</td>
</tr>
<tr>
<td>Analysis of actual performance of quality costs vs Use of indicators for lack of quality</td>
<td>$\chi^2(1)=10.280$ Sig. = 0.001</td>
<td>Reject H0</td>
</tr>
</tbody>
</table>

4. Conclusions and Limitations
Themajority of Portuguese companies with ISO certified systems do not explicitly and separately identify QRC, in management reports. Thus, they are unable to manage improvement, which confirmsthe findings of Souza and Collaziol (2006).

Also, it can be seen that companies failing to identify their QRC in management reports, did not embrace the recommendations of author supporters of management of these types of costs, as Feigenbaum (1994) and Juran and Gryna (1991), in order to report their QRC, showing the deviations from the targets, as advocated by Robles Jr. (2003).

On the importance of reporting of QRC, Robles Jr. (2003) states that the information related to these costs alone will not lead to quality improvements. However, such information should be reviewed by top management, so that, consequently, to determine actions to improve quality in the wake of Feigenbaum (1994) and Juran and Gryna (1991). In this particular aspect, the results showed a greater adherence of the respondents companies to best practices when compared with the host to previous items. Also, positively, we highlight the fact that a significant part of the companies submit their reports in non-monetary information, more appropriate for measuring the quality aspects more difficult to quantify, such as complaints, suggestions, accidents, among others (AECA, 2003).

As for budgeting, most respondents did not budget the QRC, breaking Juran (1979) and Sakurai (1997) arguments about the usefulness of the budget for management of quality related costs, as a tool for planning and control.

The analysis of the performance in the QRC, here again, the majority of the participating companies did not follow the recommendations of author supporters of managing this type of costs (e.g., Juran and Gryna, 1991; Feigenbaum, 1994; Sakurai, 1997; Robles Jr., 2003; Antonio and Teixeira, 2007; Pires, 2007; Lopes and Caprice, 2007) because they did not perform this evaluation. It is emphasized that companies measuring the performance in QRC are limited, only to perform comparisons with previous periods.

With regard to parameters representativeness of the QRC with regard to other variables, the most significant part of the companies responded that they did not use them. In the companies that used these parameters, the measurement was carried out, preferably in relation to turnover and total costs. This is also a section where companies did not follow the doctrine extended by experts in quality management (e.g., Gryna and Juran, 1991; Robles Jr., 2003; Feigenbaum, 1994). These authors affirm the need to know the representativeness of QRC, according to management needs, and recommend the use of at least three types of interactions between quality costs and other management indicators, taking into consideration the products and type of production. It is emphasized that a significant part of the companies said they did not compare the QRC with other variables. When asked the reasons for, they referred no advantage or they were unaware of the benefits or did not respond, which showed lack of sensitivity to the impact of the QRC on business competitiveness.

The investment in quality control was not done by most companies participating in this study. In companies that make such control, the cost/benefit ratio to quantify the return on these investments is the most used, followed by the net present value and payback period. Here too, the theoretical developments of various authors were not followed. For Paladini and Carvalho (2006), the improvement projects should result in process improvement and economic viability. The quality activities cost money, so the existence of the organization for quality should benefit the company, what we will never know if there is
no control. In this regard, Pires (2007) states that the economics of quality will become increasingly important in the future. Of the companies that did not control their investments in quality, a significant part did not see any advantage or did not know the benefits or did not respond, which indicates a significant detachment of the viewpoints of experts in quality management.

Considering this information, and the similar conclusions of Souza and Collaziol (2006), we can conclude that most participating companies were closer to the understanding of Deming (1990) than other authors who have studied this subject. According to Deming, companies have no need to quantify and control the QRC, which contradicts the advocated, for example, by Juran and Gryna (1991), Crosby (1994) and Feigenbaum (1994). On the contrary, according to the theories referred by Juran and Gryna (1991) and Feigenbaum (1994), it is important that the Portuguese companies with certified systems, not yet quantifying their quality related costs per category, they will make it, so they can check the importance, distribution and temporal evolution of the different sources of costs (Sellés and Carbonell, 2002). Through detailed analysis of QRC, companies can obtain a set of information that allow them to undertake and intensify actions to improve their overall productivity, as indicated in the NP4239:1994 (IPQ, 1994). And, therefore, adopt formal systems of planning and control of QRC in order to evaluate the performance of management, as emphasized by Sakurai (1997).

When companies did not prepare budget plans for the QRC, they did not analyze the respective performance, because there were no goals to achieve. As stated by Jordan et al. (2002), from the medium-term policies, the budgeting phase begins by setting short term goals. According to these authors, the budget is a management tool to support the administration in the process of achieving the objectives of the company, a tool for decision and action.

Typically, the Portuguese companies with certified systems did not use relationships between quality cost with other indicators. The few who use such relationships were limited to quantify the QRC in relation to turnover and in relation to total costs. In particular, note that the companies were not supporters of the practices recommended by Gryna and Juran (1991) and Feigenbaum (1994). The latter, that is strongly oriented towards the financial aspects of QRC (Antonio and Teixeira, 2007), emphasizes that, even without a perfect base for comparison, each firm must choose the most appropriate to their specificities. In choosing the basis of comparison of the QRC with other company data, it should consider the option, among other factors, the sensitivity to variations in production, the possible changes caused by mechanization and resulting lower labor costs, the consistency in the face of fluctuations in sales and sensitivity to changes in prices of raw materials (Feigenbaum, 1994, apud Sellés and Carbonell, 2002).

The low level of control over the investments on quality limits the analysis of the achieved improvements, even though simple techniques such as trend analysis of the various components of costs (historical cost evolution in the company), comparison between budgeted amounts and carried out, and cost-benefit analysis (AEC, 2003; Robles Jr., 2003, Carvalho et al. 2006). This circumstance also goes against the conclusion of Souza and Collaziol (2006).

Finally, it is stated that the majority of Portuguese companies with certified systems did not identify explicitly and separately the QRC in management reports, being unable to measure the
quality of their costs and respond more efficiently to various objectives, such as: to identify the company's losses related to the costs of poor quality, facilitate the budgeting of QRC, and increase productivity through quality, among other benefits (Robles Jr., 2003).

Through this survey, we sought to identify the procedures adopted in the planning and control of QRC in the Portuguese companies with certified systems, as well as verify if these organizations prepare management reports to measure the financial return from investment inequity. However, this is just a test, and neither the organizational culture, nor any resistance to this transformation can be revealed fully through a simple questionnaire. Moreover, the method of investigation by questionnaire does not allow additional questions to confirm the answers and to mitigate possible misinterpretation of the questions by respondents (Fowler, 1993; Marsh, 1982). In this sense, one cannot expect from this study the identification of any problems / benefits of the introduction of a culture of quality based on costs, since in most cases, this can only be made after the implementation of these procedures and, for some of them, only after a significant period of elapsed time.

It is also important to note that these results cannot, when they demonstrate behavior that is contrary to what advocated by different authors who have studied the subject, be interpreted as a lack of quality. The theories of Deming, Crosby, Feigenbaum, and Juran are the basis for quality improvement in an institution, whatever the level of initial quality, so that any divergence in relation to these authors, can only be regarded as a greater difficulty in achieving this improvement.

However, it was useful and interesting to identify aspects of normal functioning of a company regarding the implementation of formal systems of planning and control of QRC and the explicit identification and isolation of the costs of quality in management reports. On the one hand, this exercise not only allowed for a greater awareness of how these aspects sometimes overlooked or ignored, hindering the improvement of quality, but also contributed to a better understanding of the theories of some authors, related to the theme (e.g., ASQC, 1986; Deming, 1990; Juran and Gryna, 1991; Crosby, 1994; Feigenbaum, 1994; Robles Jr., 1996; Shank and Govindarajan, 1997; Silva, 1999; Wernke and Bornia, 2000; Ganhão, 2001; Neves, 2004; Cameleño, 2006; Villarand Lopez, 2007; Calderon and New, 2009).

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