



**CORPORATE SUSTAINABILITY: A CASE STUDY FROM THE IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEM FOR CERTIFICATION BY INMETRO IN THE METAL WORK INDUSTRY**

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**ABSTRACT**

This article presents field research with bibliographic support studying aspects related to corporate sustainability. It covers the implementation of a quality management system where sustainability and requirements are addressed in a system, in which quality is not only seen as maintaining compliance with standards and features of a product; it also encompasses numerous attributes connected with responsibility. It was concluded that there had been significant returns, which allowed it to meet quality standards and consolidate the supply of products with greater accuracy, in addition to promoting the image of the company as being socially responsible. Gains in efficiency and commitment from suppliers were also demonstrated, thus allowing



product prices to remain competitive. It shows how the company obtained the certification label issued by the regulatory body, demonstrating audited quality and standards of corporate sustainability; a feature, which is an edge for companies in the global environment.

**Keywords:** Management, Quality, Production, Corporate sustainability.

## 1. INTRODUCTION

Brazilian companies, particularly after the 1990s, have sought to position themselves solidly in a highly competitive market. In this environment, business units have sought to offer products that satisfy at least three important conditions:

- I. Meeting the quality standards agreed between buyers and suppliers, meeting legal standards, whether compulsory or not.
- II. Supply products whose prices are competitive, particularly when compared to imported goods.
- III. Offer payment terms, which allow for negotiations permitting comfortable timeframes to customers.

Accordingly, during each period, companies adopt management practices for production which lead to an environment where quality is the main keynote, since quality brings implied condition of 'no' to redoing work, and wastage, with a view to efficiency.

Accordingly planning and control of production helps companies by creating attitudes which makes them capable of making reductions in their operating costs, comply with applicable legislation, enter new markets, with a resulting increase in both scale and customer satisfaction.

State: "for a company to disseminate this way of working, it is necessary to establish standards in all sectors and departments. Integrating activities, with clear and formal controls that foster high quality standard production" (COSTA NETO; CANUTO, 2010).

Chapoval Neto And Godoy (2006) show that micro and small firms have higher costs than competitors, because they do not consider human resources as a strategic edge to achieve specific standards of competitiveness and quality.



This article aims to present the results obtained from the implementation of a Quality Management System (QMS) in accordance with Brazilian Standard NBR 15236 from the Brazilian Association of Technical Standards (ABNT) for safety of school supplies, in accordance with Ordinance 481 from the National Institute of Metrology, Quality and Technology (INMETRO), at a cutlery company.

It is important to note that the company that was the subject of this study, implemented the above mentioned standard over the period from August 2011 to February 2012, in order to comply compulsorily with the aforementioned ordinance 481; and so in this article we demonstrate both the advantages obtained by the company, and the challenges and difficulties encountered in the process of implementing the system.

The paper is structured as follows:

- Theoretical framework, covering the following:
  - Ordinance 481 from INMETRO
  - Brazilian Standard - NBR 15236
  - Corporate quality and sustainability
- Stages of implementation.
- The company that was a subject of the study.
- Results of the implementation, conclusions and prospective new studies.

## **2. THEORETICAL FRAMEWORK**

### **2.1. Ordinance 48**

Following the guidelines set forth in ABNT NBR 15236, INMETRO issued Ordinance. 481 on December 7, 2010 in order to establish "the criteria for the conformity assessment program for School Supplies, with a focus on safety, by means of a compulsory certification mechanism". The ordinance proposed to minimize the occurrence of "consumer accidents that endanger the health and safety of children under the age of 14". To implement this, it introduced, among others, ABNT NBR ISO 9000 and ABNT NBR ISO 9001 governing Quality Management Systems, in addition to ABNT NBR ISO/IEC 17025 which governs the General Requirements for the Competence of Testing and Calibration Laboratories.



### *2.1.1. Model of certification for evaluating the Quality Management System (QMS), associated with product testing (System 5).*

For evaluating the quality management system, the ordinance sought to meet the minimum requirements of ISO 9001 for assessment of QMS at companies by means of System 5 Certification. To achieve this, initial and periodic tests testing is performed, with initial and periodic assessments of the Quality Management System of the manufacturing process.

It requires a description of the item, a quality manual, control of documents, planning of production of product, design and development, the procurement process, checking product purchased, control of production and service provision, identification and traceability and preservation of product, measuring and monitoring of the product, the way in which nonconforming product is dealt with, procedures for corrective action and preventive action.

### *2.1.2. Batch Certification System (System 7).*

Merely to supplement the provisions of ordinance 481, it should be made clear that there is the possibility of certification by means of a Batch Certification Assessment, where certification only covers the specific batch that was assessed. That was not the case at the company covered by this study, which opted for System 5 (QMS).

## **2.2. Brazilian Standard NBR: 15236**

NBR 15236 - Safety of school supplies - was established in 2005 by the Special Commission for the Study of Safety of School Articles, in order to provide for technical standards for manufacturing and marketing items for school use, including products used in the school environment or educational activities involving children, including lunch boxes, pencil sharpeners, cases, satchels, backpacks, pens, pencils, propelling pencils, crayons, paintbrushes, paints, erasers, glues, rulers, correcting fluid, and round-tip scissors, using testing methods to assess articles as to their mechanical and chemical properties, so as to minimize comment or involuntary accidents involving children below 14.



The standard covers any and all risks present in school supplies, small parts, parts that disintegrate or those with sharp edges or points that might injure users through lack of attention, incorrect use or misuse, clumsiness, curiosity and falls.

It should be noted also that the standard requires products that are marketed to be accompanied by packaging containing warnings and indications of the appropriate age range, and a list of the components, stating whether or not they can be ingested or inhaled.

For manufacturing, importing and marketing on Brazilian territory, chemical, mechanical, physical, electrical or biological testing, depending on the type of product, will be required before being approved as meeting the requirements of the standard.

According to INMETRO, if school supplies already on the market are found to be non-compliant, the manufacturing and marketing thereof must be halted immediately, and the certification holder must recall the non-compliant products from the market, within a period not exceeding 30 days.

### **2.3. Corporate Quality and Sustainability**

Both the quality and sustainability in companies are recurring issues, not only because they are present in number of different types of media, or are being addressed unwillingly by several companies, but also because there is already an awareness on the part of consumers, who have a certain rejection of organizations that do not have sustainable programs and those which, similarly, do not meet their requirements to maintain certain quality standards or do not appear to have made changes that enhance their image.

Zamcope, et al. (2013) carried out a study to construct a model to assess corporate sustainability, taking into account the company's need to seek longevity of its business, using as a case study a midsize Paraná-state textile company, using Multi-criteria Decision Support - Constructivist - Methodology. In the study it was possible to identify a set of performance indicators that characterize the company's sustainability and measure the studied properties of the organization under examination and its commitment to sustainability, both individually and globally.



It should be noted that Rodrigues, et al. (2014) in a field study conducted in sugar energy industry plants, concluded, contrary to the global trend and in spite of environmental progress, that there is no proactivity on environmental issues and that companies have not yet incorporated the environmental variable into their strategies. According to the authors, most of the actions carried out in this direction are the result of conditions imposed by laws, societal pressures or certifications which have become necessary and are compulsory.

Andrade, et al. (2013) identified variables that appear to be determining factors in Brazilian companies' adopting the Corporate Sustainability Index (ISE) of BM & FBOVESPA, and the relation between adopting the latter and the market value of the companies. The researchers collected annual data on companies from 2006 to 2011. The study showed that companies that are bigger and more profitable and in sectors that are considered to have high environmental impact, are more likely to join the ISE. When the question of whether adherence to ISE has any relationship with the value metrics of the company was analyzed, the results did not contradict the positive relationship hypothesis, however, evidence of a negative relationship was found during the period following the financial crisis of 2008.

According Rodrigues (2004) standards such as ISO 9000:2000 show that in addition to customers, other stakeholders such as a society, outside customers, employees, suppliers and shareholders should be considered as parties with an interest in the business and their expectations need to be met.

Schrettle, et al. (2014) to identify the gaps in corporate sustainability, companies observe the possibilities to get involved and meet this challenge (i.e. producers, process and supply chain -related) and structure it according to the literature on development rational strategy - comprehensive decision-making. In doing so, the decision-making theme is analyzed as a response to sustainability from a managerial perspective.

Gariba Júnior (2005) explains that contrary to what happened in the past, when quality was understood to be "compliance with standards and attributes", today it includes not only proper pricing mechanisms but other factors related to social quality, adopting the same line argued by the researchers



Actions to play a role in corporate sustainability are classified as internal policies, quality of products and services, environmental preservation, contribution to the national economy and ethics. In the Brazilian context, corporate sustainability cannot be just a synonym for environmental preservation, it also creates an image that the company can be seen to be, for both those buying from and selling to the company, one that has and maintains [proper] operating standards and procedures.

According to the Ethos Institute, "adopting socially responsible management necessarily implies acting with a view to obtaining benefits to society, providing job satisfaction for employees and promoting benefits for collaborators and for the environment, without forgetting making a return for investors " (INSTITUTO ETHOS, 2014).

Stubbs and Cocklin (2008) argue that organizations become sustainable if the dominant neoclassical model of the company is transformed by social and environmental priorities and not supplemented and not added to; they propose a "Sustainability Business Model" (SBM) in which the concept of sustainability is the driving force of the company and its decision-making.

Using a trench analogy Marconato, et al. (2013) that sustainable and strategic development are separated by a trench; on one side there is the bio-centric group, who advocate that priority should be given to conservation of natural resources over socio-economic systems; on the other is the anthropocentric group, driven by the belief that nature exists to serve man and the growth of markets and technological advances are sufficient to ensure sustainability.

This contrast makes building a common vision for sustainable development difficult and results in slow progress or even going backwards in the search for a better balance between the economy, society and the environment around the world. Thus, corporate quality and sustainability reflect an effort regarding the need to exchange interests them both inside and among organizations, in the search for ways to find more collaborative means of production.

### **3. IMPLEMENTATION OF THE QUALITY MANAGEMENT SYSTEM (QMS)**

In order to achieve success, in addition to establishing the company positively in the national market, the attitudes that follow were instrumental in having corporate



quality and sustainability standards introduced in the company that was a subject of this study:

### **3.1. Commitment by the Directors**

The Board of Directors is responsible for the QMS and for delegating responsibility and authority for specific activities related to quality. The directors provided evidence of their commitment to development, with the implementation of the QMS and to continually improving its efficiency by analyzing the performance of the processes involved in production, based on the performance indicators of processes and products.

### **3.2. Customer Focus**

The company, through its employees and also the Board of Directors gives top priority to identifying the customer's needs, including their social context, as evidenced by point of sale, customer orders and market seasonality, ensuring that the business is productive and profitable.

### **3.3. Quality policy**

The company as a whole, defines and documents the Quality Policy, in order to maintain, formalize and clarify the involvement of all of the thinking and philosophy regarding quality, in order to increase productivity and competitiveness; its opinion and belief is that maintaining the quality and isonomy in its products is essential for it to remain and grow in the market. Accordingly, it seeks to implement its Quality Policy as follows:

- Maintaining the standardization of the manufacture of its products, in order to directly impact on safety, visual and functional aspects of the finished product; satisfying the customer's needs.
- Ensuring safety means ensuring that its products are handled correctly, preserving the integrity of consumers and satisfying the requirements of the law.
- Seeking at all times a relationship of trust with its suppliers, while maintaining strict quality control, using top-grade raw materials that do not harm the environment, constantly looking for new technologies, i.e. continuous improvement that prioritizes suppliers that ensure quality.



- • Employ skilled and trained professionals in the belief that it is not sufficient to put its product on the market but rather to ensure that its end consumers have to be fully satisfied with the product they purchase.

### **3.4. Quality Planning**

#### *3.4.1. Quality Objectives*

The directors must ensure that quality objectives are established and met by all members of the organization. Quality Policy and Objectives are constantly evaluated by all company employees, by means of meetings, in order to ensure consistency with organizational targets.

It is the responsibility of the Board of Directors, together with the company's employees, to ensure that the Quality Policy and Objectives are understood, implemented and maintained at all levels of the organization. The Quality Policy is posted on notice boards in all areas.

#### *3.4.2. Planning of the quality management system*

The Board monitors the performance of all activities, by analyzing the indicators of the production and management process, which are analyzed to monitor performance and ensure the integrity of the QMS and maintenance and of planned and implemented changes, by means of critical analysis review meetings.

#### *3.4.3. QMS Coordinator*

Once the coordinator has been appointed, it is his or her responsibility to check the results of internal audits, compliance with and performance of the system implanted, report on the performance of the system to the Director and perform a critical review analysis of the Quality Management System, as well as disseminating and raising awareness to the other levels of the organization of the customer's requirements and the importance of satisfying them.

#### *3.4.4. Critical review analysis by Management*

The Board carries out evaluations annually or when the performance of QMS becomes necessary, by means of critical review analysis meetings of the Quality Committee, duly recorded in the minutes. At such meetings, the quality policy and objectives are evaluated in order to maintain consistency with the reality of the



company, and requirements and opportunities for improvement of the QMS are studied, based on the results of audits, indicators of customer satisfaction, the performance of projects, and monitoring of preventive and corrective actions, in addition to actions resulting from previous management reviews.

#### 4. CASE STUDY

The company produces items of cutlery and the present study is limited to the case of production of school scissors.

It is based in the metropolitan area of greater São Paulo; in the municipality of Guarulhos and has a staff of 37 employees, 32 of whom work in production sector.

Table 1: Table comparing before and after implementation of the QMS

<i>Factor</i>	<i>Before implementation of QMS</i>	<i>After implementation of QMS</i>	<i>Variation</i>
<b>Amount of raw material processed. (Tonnes/month)</b>	3.0	3.75	Increase of 25%
<b>Raw material in accordance with specifications (Kg/day) and (Tonnes/accumulated/month)</b>	109.10	160.91	Raw material within specifications.
<b>Personnel employed on operations.</b>	2.7	3.540	Increase of 31%
<b>Number of pieces assembled: (dozens per group of workers/day)</b>	4	5	Increase in number of employees by 25%. <i>*Apparently less efficient.</i> More efficient process.
<b>(dozens per worker /day)</b>	720	1819	
	180	364	

The production process involves stamping, assembly using automatic machinery, packaging and storage. In production processes involving metal stamping, using a cutting tool for progressive stamping, there is a loss of around 45%. This loss, apparently high, occurs due to the Tool step profile of the tool and the profile of the work piece.

For the purposes of this study, the amount of raw material refers to the item (piece) scissor blade used in the product school scissors with rounded tips. This article used the second quarter of 2013 for the purpose of the calculations; after the system described in 2.1.1 above had been deployed; comparing it with the previous



semester. The proposed QMS covered the process after production of a quantity of 1,440,000 (one million four hundred and forty thousand) scissors or 120,000 dozens; each pair of scissors with two blades which amounts to 2,880,000 (2.88 million) blades.

Using the 2nd semester of 2013 for the above amount, an average for the semester of 20,000 dozens/month was obtained. 1 dozen scissors = 12 pairs, consisting of 24 blades, each weighing 130g. Therefore, the universe studied equates to 2560 kg/month. (3712 kg of processed raw material); obtaining the figures shown in Table 1 below.

## 5. CONCLUSIONS

The research proved that the option to deploy the QMS was a correct decision from a strategic point of view. Although there were costs involved in deployment, it yielded large returns, allowing for compliance with quality standards and, principally, corporate sustainability, the subject matter of this study.

The consolidation of the supply of products with greater precision as regards quality standards in addition to disseminating the image of the company as being socially responsible were also important. Losses decreased allowing product prices to become more competitive, as well as giving the opportunity for financing, offering better payment terms. An internal audit was performed on the outsourced suppliers, which helped to maintain the standards required by both the company and by INMETRO.

## REFERENCES

ANDRADE, L. P.; BRESSAN, A. A.; IQUIAPAZA, R. A.; MOREIRA, B.C M. (2013) Determinantes de adesão ao Índice de Sustentabilidade Empresarial da BM&F Bovespa e a sua relação com o valor da empresa. (Determining factors for joining the corporate sustainability index from BM&F Bovespa and its relationship with the value of the company). **Revista Brasileira de. Finanças (Online)**, Rio de Janeiro, v. 11, n. 2, p. 181–213.

CHAPOVAL NETO, A; GODOY, L.P. (2006) Qualidade e competitividade sob o enfoque de recursos humanos nas micro e pequenas empresas. (Quality and competitiveness of human resources in micro and small companies. ) **Simpósio de Engenharia de Produção (Production Engineering Symposium) – SIMPEP**. Bauru, SP, 2006. Available: [http://www.simpep.feb.unesp.br/anais\\_simpep\\_aux.php?e=13](http://www.simpep.feb.unesp.br/anais_simpep_aux.php?e=13). Accessed on 10 March 2014.



COSTA NETO, P. L. O.; CANUTO, S. A. (2010) **Administração com qualidade: Conhecimentos Necessários para Gestão Moderna.1 Administration with quality: Knowhow Necessary for Modern Management)** Pub. São Paulo: Blucher.

GARIBA JÚNIOR, M. (2005) **Um modelo de avaliação de cursos superiores de tecnologia baseado na ferramenta benchmarking.** (A model for evaluating higher education in technology based on benchmarking.) Master's Thesis. Graduate Program in Production Engineering. Federal University of Santa Catarina. Florianópolis, SC.

INSTITUTO ETHOS: **Empresas e Responsabilidade Social.** (Companies and Social Responsibility). Available: <http://www3.ethos.org.br/conteudo/sobre-o-instituto/principios-e-compromissos/#.U0gPcld1oo4>. Accessed on 7 March 2014.

MARCONATO, D.A.B.; TREVISAN, M.; PEDROZO E. A.; SAGGIN, K. D.; ZONIN, V. J. (2013) Saindo da trincheira do desenvolvimento sustentável: uma nova perspectiva para a análise e a decisão em sustentabilidade. (Leaving the trenches of the sustainable development: a new perspective for analysis and decisions on sustainability). **RAM - REV. ADM. MACKENZIE**, v.14, n. 1, p. 15-43, Jan./Feb.

RODRIGUES, M. V. C. (2004) **Ações para a Qualidade: GEIQ, Gestão Integrada para a Qualidade — Padrão Seis Sigma — Classe Mundial.** (Actions for Quality: IQM, Integrated Quality Management - Standard Six Sigma - World Class.) Rio de Janeiro: Qualitymark, 2004.

RODRIGUES, A. M.; REBELATO, M. G.; MARTINATO, M.B. (2014) Práticas ambientais no setor sucroenergético: Um estudo comparativo. (Environmental practices in the sugarcane industry: A comparative study.) **XX Symposium on Production Engineering - SIMPEP, Bauru, SP, 2013.** Available: [http://www.simpep.feb.unesp.br/anais\\_simpep.php?e=8](http://www.simpep.feb.unesp.br/anais_simpep.php?e=8) Accessed on 9 March 2014

SCHRETTLE, S.; HINZ, A.; SCHERRER –RATHJE, M.; FRIEDLI, T. (2014) Turning sustainability into action: Explaining firms' sustainability efforts and their impact on firm performance. **Int. J. Production Economics**, n. 147, p. 73-84. Elsevier Journal.

STUBBS, W.; COCKLIN, C. (2008) Conceptualizing a "Sustainability Business in: **Organization & Environment; Sage Publication.** v. 21, n. 2, p. 103-127. Available: [http://www.mymaster.com.au/files.upload/20130401\\_1252301/1364792413\\_7.pdf](http://www.mymaster.com.au/files.upload/20130401_1252301/1364792413_7.pdf)

ZAMCOPE, F. C.; ENSSLIN, L.; ENSSLIN, S. R. (2013) Construction of a model for corporate sustainability assessment: a case study in the textile industry. **Gest. Prod. [online]**. v. 19, n. 2 [cited 2013-08-19], p. 303-321. <http://dx.doi.org/10.1590/S0104-530X2012000200006>.

