RESUMO

O presente relatório origina-se de projeto destinado a analisar a gestão da qualidade no setor de serviços nacional. A pesquisa foi conduzida através do envio de questionário, contendo 135 perguntas, a uma amostra, selecionada por conveniência, de empresas de grande, médio e pequeno portes do segmento de serviços. A sondagem cobre aspectos socioorganizacionais, técnico-tecnológicos e econômico-competitivos das indústrias. Foram avaliados os procedimentos usados na gestão da qualidade e os resultados obtidos. O trabalho insere-se numa pesquisa mundial sobre gestão da qualidade, coordenada pelo Prof. Gustavo Vargas da Universidade Estadual da Califórnia em Fullerton.

PALAVRAS-CHAVE

Gestão da qualidade; Serviços; Modernização; Competitividade; Práticas empresariais.

ABSTRACT

This report was originated from a project that aimed at analyzing the quality management in the Brazilian manufacturing, processing and services industries. The research was undertaken in three stages through the mailing of a questionnaire containing 135 questions to a convenient sample of large-, mid-, and small-sized companies in each one of the three mentioned segments. The survey covered social-organizational, technical-technological, and economical-competitive aspects of the industries. The procedures employed in quality management, as well as the results obtained were appraised. This research is part of a worldwide program on quality management, under the coordination of Prof. Gustavo Vargas from the California State University at Fullerton.

KEY WORDS

Quality management; Manufacturing; Processing; Services; Industrial modernization; Competitivity; Managerial techniques.

SUMMARY

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QUALITY MANAGEMENT IN BRAZIL

José Delazaro Filho

I. INTRODUCTION

The California State University at Fullerton is coordinating a Worldwide Survey on Quality Management in Mid-Sized Economies. The survey is being conducted by local institutions in several countries. The list of countries include Spain, Mexico, Hong Kong, Malaysia, Argentina, Peru, and Brazil. In some of these countries the work is already concluded.

In Brazil, the local institution that was invited to lead the survey was the EAESP/FGV (Business School of the Fundação Getúlio Vargas – São Paulo). This institution, through its Research and Publications Center (NPP) and the Production and Industrial Operations Department (POI) undertook the present study, covering the Brazilian manufacturing, processing and services industries.

The relevance of the concept of Quality among managers would by itself justify the undertaking of a survey focused on this theme. Results of a 1995 survey carried out by the National Industry Confederation reinforce the importance of the subject: in a large sample of industrial companies, their managers chose the item "*Creation and Broadening of Quality Programs*" as their main strategy in their adjustments to face trade deregulation. In this survey, almost 90% of the answers pointed to Quality as a priority, followed in the ranking by the rationalization of production lines, and by human resources training.

Many institutions, consulting companies mainly, have been undertaking surveys on quality, and other quality related key factors to success, such as productivity, cost

reduction, delivery time, technology and innovation, in Brazil and abroad. Several books also report experiences in Total Quality Control programs implementation in national companies. However, methods and techniques used by the companies, and the actual results as well, are not always transparent. It is worthy mentioning that quality programs are long lasting, and, therefore, surveys should be carried out with a certain frequency.

Nothing is more useful to assure the survival and the progress of the Brazilian industry than knowing for sure the viability and the stage of implementation of *imported* quality programs and methodologies such as Total Quality Control, ISO 9000, National Quality Award, Quality Function Deployment, Value Analysis and other.

This survey gathers information about quality management and analyzes the results achieved by Brazilian companies, aiming at knowing which methods and management systems are currently being used in our companies, and which of them are succeeding in quality terms.

On a wider scope, the project analyzes quality management in Brazilian companies. The survey covered social-organizational, technical-technological, and economical-competitive aspects of the industries.

The survey was carried out in three stages, focusing on the manufacturing, processing, and services areas, respectively. The scopes of these categories are listed below.

The manufacturing industry includes the companies that manufacture and assemble parts, sets, and finished products identifiable as discrete units produced in batches (LOTS). This industry includes the automotive and parts segments, electric and electronic home appliances products, toys and games, clothing, shoes, furniture, capital goods, and others.

The processing industry, on the other hand, is made up by segments with central focus on chemical reaction or mechanical transformation, in which the final product is not identifiable as discrete units. That is the case of chemical, petrochemical, metalwork, ironwork, glass, cement, and others.

The services industry is characterized by its intangibility, and comprises the following major segments: advertising, promotion and public relations, communication and information, editing and printing, banks, finance and insurance, data processing and software, health care, consulting, auditing and counseling, education and formation, legal and management, research and engineering, real estate, fashion, design and art, leisure and entertainment, hotels, travel and restaurant, distribution, retail sales, wholesale, transportation, repairs, maintenance and recovery, public service (power, gas, etc.), and government services.

II. METHODOLOGY

The research was undertaken in three stages, each one addressing the areas of manufacture, processing, and services, respectively. In each one of the three stages, the research was conducted through the mailing of a standard survey questionnaires to a sample of companies chosen according to parameters that will be described below. The questionnaire (see Annex) contains 62 questions aimed at the company qualification, and 73 related with the main issues under investigation. The questionnaire was designed and tested by the international project team, and it was translated into Portuguese with punctual adjustments whenever necessary. Considering the peculiarities of each of the three areas, the questionnaires employed in each phase suffered adjustments aimed at fitting them to their particular characteristics, with no harm to the homogeneity of its general content.

In general, the questionnaires were structured by the international team, and adjusted by ourselves to cover, among others, the following main quality management related topics:

- Characteristics of the Brazilian companies involved in projects related with quality management;
- general challenges and specific drivers of quality;
- difficulties found in quality programs and actions;
- usefulness of quality programs and actions;
- development, implementation and evolution of quality programs and actions;
- impacts and results of quality;
- infrastructure and macroeconomic support required for quality achievement;
- education and responsibility for quality management;
- hindering factors and difficulties faced to achieve quality;
- advantages originated from the quality system.

To achieve such goals, the survey questionnaires formulated 135 multiple choice questions to the interviewed companies, focusing on each of the above mentioned aspects in a high level of detail.

According to the widely accepted methodology in the international research program, the sample was selected according to convenience criteria, and it met the following mutually exclusive requirements:

- to have more than 300 employees;
- annual turnover above US$ 3,000,000.00

- to be among the leaders in quality within its sector, or to be relevant in its economic context;
- to have an ongoing quality program.

The sample selection did not obey to random criteria, and was driven by convenience. The reason for this approach is that the survey is expected to reflect what the leaders in quality and successful implementers do, instead of reflecting what most industries do in terms of quality management. Clearly and logically, where the leaders go, the rest will follow. Thus, a deliberate obliquity was introduced in the sample selection, considering the intention of reflecting the best practices in quality management, in accordance with the approach used by researchers in the other countries.

III. SURVEY INTERVIEWS CONDUCTION

Each stage of the project was undertaken according to the steps described below, in which the main activities are highlighted, as well as some difficulties found:

- questionnaire design;
- the sample selection: a set of proprietary lists, besides Fiesp/Ciesp`s Industry Yearbook 96/97, were used. Several publications were also used, and other available lists as well, to select companies that would fit into the research criteria;
- questionnaire mailing: as an initial procedure, the companies were contacted by telephone, aiming at obtaining the agreement of the researched company to participate in the survey. No questionnaire was sent to companies that did not show interest in joining, or that did not have time or human resources available to participate. It is worthy mentioning that, even among the accepted questionnaires, some answers were eliminated from the analysis for technical reasons, as well as

the non-answered questions. Such facts, though, did not harm the development of the research.

- Receipt and follow-up of the answers: in the contacts with the quality area personnel, it was possible to identify some reasons that prevented a higher index of answers:

  * questionnaire length: it was considered too long and complex;

  * excess of work in the quality area in most of the companies. The Quality area personnel was too busy, with low availability of time for activities other than their own.

  * Most services companies showed an additional difficulty, which is the early stage of development in quality issues in this area, or even the absence of a specific quality management area. The services sector, and this is not a coincidence, had a lower index of return. In item IV, the difference in relative speed of development in assimilating quality tools among sectors is explained.

IV. THE EVOLUTION OF THE INDUSTRY AND OF THE SERVICES SECTOR IN BRAZIL

Except for isolated cases, the installation of industries in Brazil only started by the end of the last century. In the period between Word War I and World War II, the industrialization got an effective impulse, but it was only in the Fifties that the country could start an industrialization process.

The quick deployment of an industrial base in the country as from the 50`s was driven by government policies based on the so-called imports substitution model, which kept its strength until the eighties. The strategy included a wide protection to the national industry, and did not limit its effects to the industry in its earlier stages of development, but extended itself to more advanced stages. The government

involvement in the process included the design and implementation of the protection system, promotion and regulation, and even direct partnership in the productive investment. The Brazilian government created a huge State-owned production scheme in sectors such as oil, chemical, steel production, and infrastructure.

The strategy was successful. According to Coutinho (1994), as early as 1980, the Brazilian industrial structure showed a high degree of sector integration and production diversification. Such a structure was not significantly different from those of most developed economies. Just like the industrialized countries, Brazil had a significant part of the industrial production originated from the chemical and metal-mechanic complexes.

On the other hand, the industrialization through imports substitution revealed itself insufficient to foment the innovation capacity of the national industry. According to Coutinho (1994), the technological efforts in the period were “limited to those required by production in itself”. Besides the insufficient capacity to develop new products and processes, other central issues of the prevailing industrialization model until the eighties were the absence of a clear standard of specialization, and the insufficient integration with international markets.

In the absence of the adequate incentives, the Brazilian industry entered the 90`s operating technologically outdated facilities, showing shortage in processes technology, and retard regarding products technology, and investing a small fraction of sales revenue in research and development activities.

In the early 90`s, the Brazilian industry showed “limited diffusion of quality systems both in products and manufacturing processes,” and showed a remarkable sluggishness in the adoption of managerial and organizational innovations. Other problems were the insufficient interaction between user and producer, and the presence of an outdated standard of work and management relationship, characterized by low investment in human resources training and labor

qualification. In this last issue, the problem is widespread over the Brazilian educational system, which shows deficiency in almost all levels.

The 90`s brought important changes to the scenario, specially on what concerns the industrial policy and other macroeconomic aspects. The present decade witnesses the interment of the imports substitution model, and the end of the long era of protection used as industrial policy instrument. In this new phase, the exposure to the international competition, both in internal and external markets, inaugurated unprecedented challenges to the local industry. The new scenario of the 90's, and the recent years is the object of the analysis in item V – The Brazilian Macroeconomic Environment.

V. THE BRAZILIAN MACROECONOMIC ENVIRONMENT

The Brazilian economy began the 90's amid the inheritance of a strong recession originated in the precedent decade. Since 1930, the country used intense government partnership in the production, and a high degree of tariff and non-tariff trade barriers to imports to create a huge industrial complex based on the substitution of imports by national production.

The government intervention, barriers in almost all sectors, and the consequent low degree of internal competition brought low efficiency, and market distortions that implied in difficulty to compete internationally, a basic requirement to the survival of enterprises in a globalized environment where huge blocks of countries are created.

The early 90`s witnessed an economic opening up that aimed at reverting those problems originated from the previous imports substitution model. To the strong imports tariff reduction was added an overvaluation of the local currency associated to the price stabilization policy. This combination of factors exposed the national

enterprises to an unprecedented level of competition in their local markets. To make things worse, besides the operating and processes deficiency, the competitivity conditions of the national industries were degenerated due to inefficiency in infrastructure such as ports equipment, transportation and telecommunications, and generation and distribution of electric power. At the same time, the conditions imposed by the need to promote the external balance under currency over-evaluation forced the maintenance of high internal interest rates as a form of attraction to the foreign speculative investment.

So, recently, to the joint pressure originated from the over-evaluation of the currency and low import tariffs it was added as worsening factor: high interest rates, high infrastructure costs, unbalanced tax collecting system and inadequate distribution of the fiscal burden, incidence of taxes over exports, low levels of health and education, among other structural deficiencies. These elements make up a condition that exposes the national industry to a strong competitive pressure, forcing it to scale cost reduction, quality levels, and operating efficiency.

From the point of view of the external balance, the recovery of trust of investors in the country, probably associated to factors such as democratic consolidation and progression in inflation reduction has attracted foreign productive investments in extraordinary volume. The external capital entry, though, may suffer reduction in function of the recent international stock exchange crisis that depressed the prices of real estate all over the world, and reduced the exceeding liquidity in the world, a probable “speculative bubble” that fed emergent economies with an important flow of resources. Even though, the country preserved a good reputation among emergent markets, and may attract a considerable part of the remaining investment capital flow. This tendency may be reinforced by the volume of assets that still remain in the hands of the government, and that attracts the attention of foreign investors.

Recent developments could bring some optimism. Heavy direct investment flows, price stability, democracy consolidation and infrastructure improvements are

reducing significantly Brazil's risk in international markets, bringing good perspectives for the country. However, the fulfillment of the promise still depends on aspects such as the public sector financing requirements, which remain too high, and the presence of a significant external debt. On the external side, the balance of payments is heavily dependent on capital flows, bringing some fragility to the balance. A recent turmoil shaking East Asian economies put in risk the external financing, but the high flows were promptly recovered right after the main signals of the crisis went out of the scenario. The fiscal risk is relieved by the huge assets portfolio of the public sector, which is generating significant flows to the privatization process. In this sense, the privatization revenues help the external balance through the attraction of direct investments, and the fiscal balance by generating revenues to the public sector.

The National Privatization Program (PND), started in 1990, is succeeding both on the fiscal aspect, generating significant revenue and public debts payments, from the point of view of transference of property. Regarding the latter, about fifty companies were already sold to the private sector, including the Companhia Vale do Rio Doce, Companhia Siderúrgica Nacional, and other important enterprises.

The PND is also producing remarkable results in the infrastructure sector. The privatization of ESCELSA, the Espirito Santo State electricity distributor sold in 1995, marked the beginning of the privatization of the infrastructure sector within the PND. Most of the public utilities owned by the three levels of government are included in the privatization list, including the Eletrobrás and Telebrás systems, two of the biggest electricity and telecommunication business around the world. Sectors targeted by the PND, with ongoing privatization, include telecommunications, electricity generation, transmission and distribution, ports, railroads, toll roads, urban public transportation, water, sanitation and trash collection, gas distribution, and waterways.

Another important step was the auctions for concession of the 22,000 km railroad system operated by Rede Ferroviária Federal. Other 2,000 km of tracks were sold together with the Companhia Vale do Rio Doce. The remaining 5,000 km are owned by Fepasa, the São Paulo State railroad company, which has its concession auction scheduled for 1998. The privatization in the railroad sector brings an important force of change in the Brazilian cargo transportation system matrix, with potential high effects on production costs. Transportation costs are also declining due to concessions of toll roads, and increasing competition in the airlines sector. International transportation is also benefiting from these efforts, by the privatization of ports, and through the modernization of the Labor laws that burden ports operation in Brazil.

Other initiatives oriented to face these challenges is the Brazilian Program on Quality and Productivity (PBQP), a government effort. However, almost 9 years after its start, the outcomes are still below expectations.

Within the challenging environment that was described, the quality improvement must be a need. This study presents in its results the practices of the national industry in seeking competitiveness through quality, allowing to detect the signs of survival, and to assess the current practices that are essential for economic and business growth.

VI. QUALITY IN BRAZIL

The creation of Petrobrás – Petróleo Brasileiro S. A. in 1954 marked an important step of the implementation of quality systems and processes in Brazil. Such as start was undertaken under the Canadian Standards Association (CSA) standards series Z29. By the late Fifties, the arrival of the first automotive companies, including Volkswagen, Ford, General Motors, and Mercedes-Benz, gave a strong impulse to the quality movement, since they imposed to their suppliers quality performances similar to those applied to international suppliers. Each manufacturer used its own

quality concepts, defining its own requirements, creating difficulties to the autoparts companies.

Even considering Petrobrás and the automotive companies as the starters, few results were achieved in the national level affecting other industries before the seventies, when the aeronautic industry was installed, and the nuclear industry had its first contracts signed up. Behind these industries, standards for quality systems management were introduced with worldwide acceptance.

These events brought the concern with quality to the Brazilian industry, but still did not create a general movement of the whole industry, remaining limited to the biggest companies.

As from 1990, the first Portuguese version of the NBR ISO 9000 (the Brazilian Standard related to the international standard) was issued. The first company to obtain a ISO 9000 certificate was VIBASA – Villares Indústrias de Base S.A.. From this year on, more companies became interested in quality, while others were forced to do it by the international competition. At this time, a wide movement of certification under the ISO 9000 standards was initiated.

Slowly, the ISO 9000 certification grew up, driven also by the PBQP. Brazil has been keeping high rates of growth in ISO 9000 certification. In 1996, there were more than 1,500 certificates, a figure that makes the country one of the 15 with the higher level of certification worldwide. Certifications are still growing fast.

These arguments show that Brazil has been growing in terms of concern with quality, even considering the fact that the certification under ISO 9000 is only an initial step to reach excellency in the process of quality management, a passport to face competition in a globalized economy.

Presently, the quality requirements in a company are most of the time linked to the *Just in Time* system, acting as pre-requisites to the implementation of such a system. The Just in Time concept may be seen as the pursue of the elimination of waste of resources, and continuous improvement. In this context, quality management has been named Total Quality Control, and was developed in Japan based on Joseph M. Juran, W. Edwards Deming, and A. V. Feigenbaum's works in the fifties.

The attribution of the responsibility for quality in production to all its components and participating personnel is one of the foundations of the total quality system. In other words, quality should be present in all the sources or parts of the processes of production, making sure that the products are being produced with the desired quality, not only undertaking inspections after the production.

As relevant aspects of the total quality control, there may be highlighted:

- Process control – the control of all stages of the process along the production. There should be a complete effort to inspect all parts produced, using the same personnel of production. Each point of work should also be a center of inspection and quality control;
- Visibility and quality correction – measurable and visible quality standards should be established, aiming at the instant detection of all abnormal situations, and the correction of the problems of quality in the same point of work that generated the problem;
- Discipline for quality – there should exist a perfect synchrony of the personnel in terms of quality goals, and the continuous appreciation of efforts of improvement. A total involvement of the management as a whole is necessary.
- Organization and cleanliness of the factory.

The importance of such aspects is based upon the stability of the continuous process of quality improvement.

The services sector in particular shows some special characteristics that deserve to be noticed, in function of their direct impact on the quality tools when applied to this sector[1]

1. Attitude. The attitudes of the service rendering personnel, such as kindness and courtesy, are essential features of services quality.

2. Promptness in delivery. In service, delay in delivery is most of the time unacceptable, specially because the services are designed to satisfy momentary needs. A clear example is the existence of long lines in an amusement park, converting the leisure time that creates value to users into an inconvenience.

3. Equipment and facilities. Cleanliness, adequacy and appearance of uniforms, tools, equipment and building are quality attributes in services, conversely to what happens with a product that contains in itself the attributes that create satisfaction. In this sense, accounting offices should be equipped with state-of-the-art computers, which are a quality attribute.

4. Product. Both, products and services, should be free of defects.

5. Consumer satisfaction. When considering this variable, one should notice the main differences between services and manufacturing/processing industries[2]:

    - Services are intangible;

    - Services are perishable;

[1] LEFEVRE (1989).
[2] KING (1985).

- Services involve complex delivery systems;
- Services are time-sensitive;
- Consumer involvement is unpredictable;
- Consumer standards are difficult to identify, frequently involving preferences or even mood.

Among the three sectors analyzed in this work, it was clear that, theoretically, the services sector is the one that assimilate most slowly the quality management tools. According to ARMSTRONG and SYMONDS (1991), the fluid nature of the product is responsible for the biggest difficulties in quality improvement in services. As a consequence, in 1991, according to the authors, only 10% of the American service providers had an ongoing quality program. However, the forecasts for the year 2000 are that this figure will increase up to 70% of the companies with more than 500 employees. The services usually considered as more aggressive are the financial services, health and government, followed by retailers and universities.

VII. RESULTS ACHIEVED AND ANALYSIS

The number of questionnaires sent, and the degree of return are present in the table below. It is worthy mentioning that the figures on the table are within the expectations, and relatively close to the numbers achieved in other international surveys of the *Worldwide Survey on Quality Management in Mid-Sized Economies*.

	Number of Questionnaires Sent	**Questionnaires returned and included in the analysis (number and % of total)**	
Manufacturing Industry	205	42	20.5%
Processing	220	34	15.5%
Services	202	17	8.5%
TOTAL	**627**	**93**	**15.5%**

The Table shows that, according to previous expectations, the manufacturing sector shows the highest index of return, due to the fact that the quality management techniques are more spread and effective in this sector. Still within previous expectations, the services sector produced the smallest return, due to slower diffusion of quality management in this sector.

Even considering the questionnaire length and the high effort required to answer it, most of the results are discussed in this Report according to the format of the proposed questions. However, some were aggregated for operating purposes. The following themes include most of the questions answered, namely:

- Characteristics of the researched companies;
- Quality Challenges and Drivers faced by the companies;
- Degree of utility and difficulty in the implementation of programs and actions of quality;
- Impacts, and economic and multi-structural results of quality;
- Required macroeconomic and infrastructure support;

- Education and responsibility for quality management;
- Hindering Factors and difficulties faced to achieve quality;
- Advantages of the quality system.

The analysis and structuring of the results followed the same general lines of the report concerning the Spanish industry. In this sense, such procedure was adopted to create compatibility of information and conclusions, as well as to make easier the international comparisons. Thus, the same logical structure of organization of the questions, text, and conclusions was used as in the Spanish report. The same logic was employed in the three preliminary reports already published by the Research Publications Center at EAESP/FGV.

1. MAIN CHARACTERISTICS OF THE RESEARCHED COMPANIES

The profile of the sample companies is shown in *Table 1 – Sample Profile*.

Following a criterion of size, the sample is distributed as follows: 37% of the companies are small sized, with less than 500 employees. In the medium size range (501 to 5,000 employees) there are 58% of the companies, while 9% can be considered as big companies, with more than 5,000 employees.

The annual sales follow the same distribution: 30% of the companies sell among 3 to 100 million *reais* per year, and can be considered as small size companies. The remaining medium and big size, with sales of more than 100 million *reais* per year, represent 45% of the sample. The remaining 25% are companies that did not disclose their sales data.

The products and services lines are rather diversified. Among the products lines, the more representative are the electrical/electronic with 21%, chemical/oil with 15%, parts, and metal-mechanic components with 11%. The segment Other, representing 18% of the questionnaires, shows a wider diversification of product lines.

The services lines are also diversified. Wholesale distributors, transportation, and public services were the most representative, 14% each. Government services correspond to 8%, while publication/printing, banking/financial/insurance, data processing/software, and research/engineering represent 7% each, a still representative participation. Other segments total 22%.

Operations in the product area are characterized by high volume, totaling 63% of the answers. Most of the manufacturing and processing companies show repetitive operations (86%).

Services companies focus on high volume (64%). Concerning the distinction between standardized and personalized services, the sample is homogeneous, with 42 and 51% respectively.

2. QUALITY CHALLENGES AND DRIVERS

The more relevant challenges and drivers are shown in Table 2 – *Challenges and Quality Drivers*, as well as in *Picture 1 – Factors of Success, Surviving, and Growth*, showing the relative importance in a scale from 1 (very low) to 5 (very high).

Among the factors of success, survival, and growth for the next five years, the productivity and product quality were considered as the most relevant. Capital availability, materials, and labor costs also showed important, with an index higher than four, corresponding to a high relevance. The items labor relations, legal

responsibility for the product, and government regulation received a medium importance. In this particular, it is worthy mentioning that the companies did not rely, and should not rely exclusively on quality programs instead of other resources and interests of the organization.

As main drivers, the companies highlighted greater quality requirements of product, opportunities offered by computing/communications, need to reduce operating costs, growing international competition, better usage of resources, Mercosul creation, and better education of their personnel, in decreasing order, but all of them with an index higher than four (high importance).

The answers on the drivers made clear that for those enterprises, the efforts on quality seeking are associated with a combination of organizational, competitive, and economic causes. In this last aspect, it is evident that the motivation for this quality achievement is strongly linked to the inputs from the macroeconomic environment described in item V, including the challenges originated from the economic integration.

3. DEGREES OF DIFFICULTY AND UTILITY IN THE IMPLEMENTATION OF QUALITY PROGRAMS AND ACTIONS

These themes are analyzed in aggregate form per relevant item that expresses the difficulty and the utility in implementing quality programs and actions. The results are presented in *Table 3 – Difficulties and Utility of Programs and Actions of Quality (Short and Long Term)*, *Picture 3 - Difficulties on the Implementation of Quality Programs and Actions (Short and Long Term)*, and in *Picture 4 – Degree of Utility of Quality Programs and Actions (Short and Long Term)*.

As it can be seen in Table 3 and Picture 3, most quality programs did not face extraordinary difficulties to be implemented. The difficulty scale ranges between 0 (no difficulty), and 3 (complex difficulty) and is presented for short and long run.

In the short run, there was no item with difficulty higher than simple. In the long run, the items Human Resources Management, Payback systems, and High Management Support were appointed as routine difficulty, while the remaining items were considered of simple difficulty.

It is worthy noting that the difficulty originated from high management support, Payback systems, and Human Resources Management increase considerably when the time horizon increases. In the Manufacturing Industry, however, the difficulty in the long term for these items, except for the Human Resources Management, does not reach the routine difficulty level, though it increases with time. In the processing sector, the aspects of product/service/process development, and the methodologies/technologies of analysis/management control show a higher difficulty evolution than other sectors. The site management and maintenance management showed both low difficulty in the short and long runs.

Regarding the utility, all the listed points were considered as moderately useful, both in the short and in the long run. Comparatively, these item show slightly significant differences in utility. In the short term, for materials, suppliers, and distribution management, and Human Resources management. In the long run, the items high management support, quality assurance, and development of products/services/processes show higher relevance.

The result in each one of the three sectors follow the same pattern of the global results. In the services sector, the sole significant difference shown was the low utility indicated for high management support in the short run. This same item, however, was appointed as fundamental in the long run by enterprises in the services sector. In the global assessment, it is noticeable that the utility of tools in

the long run, taken individually or together, seems more significant in the services sector than in the manufacture and processing sectors.

An interesting aspect of the results obtained in this item concerns the comparison between difficulties and utilities of programs and actions for quality management. In general, the indices obtained for utility are rather higher than those obtained for difficulties, showing a positive expectancy of the companies regarding quality management. Another view of the relationship between difficulty and utility is shown in the next topic, with the analysis of specific graphs.

4. DEVELOPMENT, IMPLEMENTATION AND EVOLUTION OF QUALITY PROGRAMS AND ACTIONS

Both *Picture 5 – Quality Management: Short Term Situation* and *Picture 6 – Quality Management: Long Term Situation* link explicitly the degrees of difficulties and utility of the several quality programs, and actions in the short and in the long run. This item aims at defining some criteria for development and implementation of these programs.

In ideal terms, a company should, in the short run, undertake the programs and actions of the first quadrant, i. e., high utility and low difficulty. As the next step, it could seek for programs and actions in the second and third quadrants, but remaining always above, and to the right of the 45^{o} line. At last, it should look for the remaining programs and actions located below the 45^{o} line; the programs and actions located in the fourth quadrant should be postponed.

From this point of view, and according to what the survey shows, in the short and long runs, the companies are actually seeking actions located in the second quadrant — high utility and high difficulty — with some actions closer to the ideal situation,

the first quadrant. In general, the actions are positioned above the 45º line in the short and long runs, meaning a higher level of utility than difficulty in each action.

5. ECONOMIC AND MULTISTRUCTURAL IMPACTS AND RESULTS OF QUALITY

The *Table 4 - Contributions to the Improvement of Organizational Development* shows and associates the contributions of the researched programs and actions that affect the organizational performance. These contributions are based on programs that impact the four critical quality drivers: quality, cost, flexibility, and client service. This multi-dimensional analysis comes from the information presented in *Table 2 – Challenges and Quality Drivers*, in which its clear that in Brazilian companies, as well as in emerging and industrialized countries, a quality oriented program or action interferes and promotes positive results in other aspects of importance to its performance and improvement of the organizational performance.

Table 4 shows that programs and actions impact primarily the quality, both in the short and in the long run. Some, however, have more evident effects on quality than others. In the short run, these actions are: high management support, payback systems, Human Resources Management, and quality assurance. In the long run, the development of product, services, and processes has a more significant effect on quality.

6. MACROECONOMIC AND INFRASTRUCTURE SUPPORT

As shown in item V, Brazil suffers from the lack of government support in the macroeconomic, social, and infrastructure areas. Such factors are essential for

competitivity-oriented business development, and for the efficiency of the productive system.

Table 5 – Need of Government Policies and Programs for Quality Improvement presents a profile of policies and government programs to help or support the effort of local companies for both the short and long runs.

Remarkably, in the short term, fiscal incentives to investment and to personnel formation, besides the flexibility of the labor market, were pointed out by the companies as relevant government policies and programs. The companies also appointed moderate credits for development and formation, fiscal incentives to develop new technologies/products, infrastructure improvement, and better programs of general education.

More relevant in the long term is the promotion of scientific-professional sponsorship, privatization programs, higher investment in technical and professional education, and higher investment in basic education.

The results obtained reinforce the opinion that the policies of incentives and professional development are fundamental for quality development and market growth.

7. EDUCATION AND RESPONSABILITY FOR QUALITY MANAGEMENT

In function of the great importance of training and education, the *Table 6 – Personnel Trained in Quality Subjects* and *Table 7 – Subjects Covered in Quality Control and Process Training* present the extension and content of themes addressed in training and formation developed by Brazilian enterprises.

Table 6 shows a great involvement in all levels of the Brazilian companies with training programs on quality issues. In general, the efforts of these companies in its involvement with quality have been very strong in recent years, specially in function of the ISO system. It can be highlighted that this movement is a start in the quality field, and the training process is in progress. The majority of the personnel knows about quality and its importance, and are prepared and motivated to contribute to the growth in the program implementation. The data shown in the referred Table reinforce the argument that the quality movement in Brazilian companies is irreversible, and its importance has been reassured by several international organizations.

It should be clear, however, that the technical training in quality will grow a lot along the following years, given the importance of the theme for the success and survival of the companies.

Table 7 shows the contents of formation in quality control and processes. There is a large interest and involvement of the personnel with such themes. This conclusion may be produced by the lack of in-depth investigation in the questionnaire, which did not address questions on the depth of preparation, and the level of knowledge accumulated in these control levels. Thus, one should not declare that most of the personnel of the sample companies have effective conceptual qualification and practice in these complex items. The result, however, shows a strong potential to help in the implementation of control systems. Analyzing Table 7, a relative efficiency is evident in the use of computers in the industries, a fact perfectly explained by the economic blocking to which the country was submitted during the market reserve in the computers sector.

In Table 7, one can see that the most addressed tools in training programs in services companies are, ranked by importance: cause-effect histogram, histograms, sampling statistics, Control charts by variables, sampling for acceptation, data stratification, Pareto Analysis Control charts by attributes, adjustments for the

implementation of SCP and dispersion diagrams. The less addresses themes are CCP usage in microcomputers and histograms of probabilities.

In the services sector, the more addressed themes are similar, with the exception of SCP implementation, Control charts by attributes, Control charts by variables, and sampling statistics.

In *Table 8 – Interest for Updating Knowledge in Quality Management*, the degree of interest is represented by a scale ranging from four (high interest) to zero (no interest). It can be noticed that, in general, the companies show a high interest in learning. This fact reinforces the high involvement and motivation shown by the operating and executive personnel with the implementation of quality management systems.

Comparing the index of interest for the update of knowledge about quality management along the three researched sectors, it is clear that the manufacturing and processing segments reach a higher index than the services sector.

In transnational companies in Brazil, concerning the location of responsibility, or the effective interference in the critical dimensions of the quality management, a strong presence of the mother organization is evident, especially in activities related to the project of products and processes, as shown in *Table 9 – Responsibilities for Critical Dimensions in Quality Management*.

Basically, the Brazilian subsidiaries are in charge of organizational issues of quality management, such as management and direction of processes and labor, and they show a strong presence in the relationship with suppliers and clients. However, the orientation by aspects of services and products development has strong presence of the head office.

8. HINDERING FACTORS AND DIFFICULTIES FACED FOR QUALITY SUCCESS

Table 10 – Hindering Factors for Quality Success and *Picture 7 – Hindering Factors and Difficulties for Quality Success* indicate the main impacts on quality implementation on a scale from 1 (negative impact) to 5 (positive impact). Through the analysis of Table 10, it is clear that the companies consider that the main factors linked to success are relatively easy to be implemented in the initial stages of implementation of the quality system.

The factors mentioned as those of less difficulty were the lack of individual responsibility, the lack of adequate training, company practices incompatible with the quality objectives, the lack of clearly defined criteria, and low communication between management levels.

The more important hindering factors are the external economic factors, outdated technology, delayed delivery of material by suppliers, lack of personnel, non availability of the best equipment, and excessive concern with costs.

The importance given to the external economic factors, together with unavailability of the best equipment are related with the typical instability of the Brazilian macroeconomic environment now lessened, and the difficulties to update the national technological park, always outdated in relation to the state of the art employed in developed countries. The concern with the delays from suppliers may reveal the lack of dissemination of quality programs from the Brazilian enterprises to the suppliers.

Table 11 – Difficulties for the Success in Implementation of Quality Management presents the difficulties in the implementation of quality systems. Some interesting information contained in this Table are the lack of knowledge and/or understanding of the payback systems, products/process/services development, and the lack of organization or procedures for human resources and maintenance management.

9. ADVANTAGES ORIGINATED FROM THE QUALITY SYSTEM

In *Table 12 – Advantages originated from the Quality System*, the potential gains due to the implementation of the quality system are shown. Most of the answers showed an advantage smaller than 19% (68% of the answers). Inside this range, 21% assess advantages smaller than 5%, while 28% stayed in the range 5-10%. The remaining 19% stayed in the range of 11-19%. About 23% revealed uncertainty on the advantages of the quality system.

In the services sector, the level of uncertainty reached 50%. The remaining 40% in this sector concentrated in the range of 0 to 19% of total sales.

VIII. CONCLUSIONS

Particularly, each item was analyzed along the research, and specific conclusions were reached in each one of the them in the body of the report. The general conclusions that could be reached are the following:

- The quality increased its importance for the survival of the Brazilian manufacturing, processing and services industries. Even considering its initial stage of implementation, quality management systems are being built as a competitive strategy, and shown up as a tool to achieve productivity and flexibility in the production process. However, it was clear in this report that the quality-related aspects are not the only objectives of the companies, since factors related with productivity, cost reduction, rationalization of methods and processes, human resources development, and others are also present.

- The quality programs in general are not extremely difficult to be implemented. In its initial step of implementation, industries always find difficult the

incorporation of new practices, however, these difficulties reduce along time. It is clear in this report that the concern of Brazilian industries with quality is an irreversible process.

- Quality programs stimulate the general development of the companies, improving operating performances, as well as promoting improvements in the organizational unit, and in the sense of responsibility of the personnel involved.

- In the Brazilian industries, a significant effort of human resources preparation in the quality field is being made. At the same time, this report showed the effective involvement of people with the programs. The importance of the theme is strongly considered among the companies, both from the point of view of their own human resources capacitating, and the government support with policies in this direction.

- The Brazilian macroeconomic environment and its dynamic characteristics have been an important driver of quality efforts in local companies. It is clear that they are reacting strongly to the difficulties arisen from this environment, and the quality management shows up as a natural response to the challenges presented. This aspect is confirmed by the results of the survey, both implicitly and explicitly.

Many other conclusions may be reached as from the presentation and analysis of the item, as well as many other information and results crossing may be done, which have not been discussed in this report.

In general, it is possible to conclude that the Brazilian industries are in an initial stage of implementation of total quality, but there is a great involvement. A worthy mentioning aspect concerning this particular point is the presence of clearly defined quality criteria, and adequate formation as the companies appointed that these factors do not represent difficulties to reach their quality goals. These two factors

are the key to this process. Many adjustments and reformulation will be necessary in time to reach success, but in general it must be considered that the Brazilian enterprises have prospered amid difficulties in the field of quality management.

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X. ANNEX I - TABLES

Table 1

Sample Profile

Dimension	Attribute	% of answers
Size of the organizations	Number of employees	
	Up until 500	37
	501 - 1.000	16
	1.001 - 3.000	25
	3.001 - 5.000	13
	+ de 5.000	9
Annual turnover	Turnover ranges (R$ millions)	
	3 – 100	30
	101 – 500	21
	501 - 1.000	9
	+ de 1.000	15
	No answer	25
Main lines of industrial products	Industrial	
	Electric/electronic	21
	Parts/components metal-mechanic	11
	Precision Instruments	1
	Industrial and agriculture machinery	1
	Plastics/rubber	4
	Chemical/oil	15
	Pharmaceutical	6
	Steel/ferrous and non-ferrous metals	6
	Paper/pulp e derivatives	4
	Food Products and derivatives	6
	Textiles/fabric/wool	4
	Cars/transports	3
	Other	18
	Services	
	Publishing/printing	7
	Banking/finance/insurance	7
	Data processing/software	7
	Research/engineering	7
	Wholesale distribution	14
	Transports	14
	Public Services (electricity, gas, etc)	14
	Government services	8
	Other	22

Type and volume of the operation	Types	
	Industrial	
	High volume/repetitive	61
	Low volume/repetitive	25
	High volume/non-repetitive	4
	Low volume non-repetitive	10
	Services	
	High volume, standardized	35
	High volume, customized	29
	Low volume, standardized	7
	Low volume, customized	22
	Does not know	7

Table 2

Challenges and Drivers of Quality

Dimension	Attribute	Relative importance
Factors of success, survival and growth in the next five years	Product quality	4.68
	Productivity	4.72
	Government regulation	3.46
	Legal Responsibility for the product	3.68
	Materials/labor Costs	4.28
	Capital availability	4.30
	Labor relations	3.95
Drivers of quality (seven most important)	Greater quality requirements of the product	4.59
	Need to increment flexibility	4.11
	Increasing international competition	4.27
	Need to reduce operating costs	4.29
	Need to reduce quality costs	4.02
	Better use of resources	4.35
	Higher education of its personnel	4.10

Reference scale:
1 = Very low
2 = Low
3 = Medium
4 = High
5 = Very high
0 = Uncertain

Table 3

Degree of Difficulty and Utility of Quality Programs and Actions

Dimension	Action/program	Relative importance Short run	Relative importance long run
Degree of difficulty of implementation (1)	High Management support	1.56	2.04
	Payback systems	1.73	2.05
	Human Resources Management	1.64	2.06
	Quality assurance	1.68	1.68
	Materials, suppliers and distribution	1.73	1.75
	management	1.57	1.65
	Maintenance management	1.84	1.70
	Operation/Processes management	1.40	1.50
	Sites Management	1.89	1.93
	Development of products/services/processes		
	Methodologies/technologies of management analysis/control	1.60	1.80
Degree of utility (2)	High Management support	2.44	2.66
	Payback systems	2.37	2.35
	Human Resources Management	2.55	2.49
	Quality assurance	2.42	2.58
	Materials, suppliers and distribution	2.81	2.41
	management	2.47	2.38
	Maintenance management	2.26	2.31
	Operation/Processes management	2.13	2.30
	Sites Management	2.23	2.52
	Development of products/services/processes		
	Methodologies/technologies of management analysis/control	2.13	2.15

Reference scale:

(1)
0 = No difficulty
1 = Simple Difficulty
2 = Routine Difficulty
3 = Complex Difficulty

(2)
0 = Useless
1 = Of little utility
2 = Moderately useful
3 = Very useful

Table 4

Contribution to the Improvement of Organization Development – Programs and Actions

	Assessment of the contributions (% answers)							
	SHORT RUN				LONG RUN			
	Q	C	F	E	Q	C	F	E
	55	10	24	12	46	13	27	14
HIGH MANAGEMENT SUPPORT								
Payback systems	44	15	28	14	38	18	33	10
Human Resources Management	51	21	19	9	43	24	22	11
Quality assurance	56	18	13	13	55	15	16	14
Materials, suppliers and distribution management	30	31	20	19	27	34	16	22
Maintenance management	29	32	24	15	33	34	21	11
Operation/Processes management	35	23	26	16	38	28	21	13
Sites Management	33	24	26	16	26	27	28	19
Development of products/services/processes	46	26	17	10	54	26	12	8
Methodologies/technologies of management analysis/control	39	25	24	11	37	30	19	13

Contribution reference:
Q – Higher quality
F – Higher flexibility
C – Lower costs
E – Best Delivery

Table 5

Need of Government Policies and Programs

Policies /programs	**Relative importance (%)**	
	short run	**long run**
Bigger investment in basic education	49	51
Bigger investment in technical-professional education	47	53
Best programs of general education	51	49
Improvements in the physical infrastructure	52	48
Fiscal incentives to investment	76	24
Fiscal incentives to development of new technology and/or products	53	47
Fiscal incentives to the formation of personnel	67	33
Moderate credits for development and formation	55	45
Promotion of scientific-professional sponsoring	42	58
Flexibility of the labor market	67	33
Programs of privatization	46	54

Table 6

Trained Personnel in Quality Issues

POSITION LEVEL	0 to 25%	26 to 50%	+ than 50%
Corporate *Staff*	21	7	72
Divisional *Staff*	14	3	83
Local manager	15	4	80
Direct Supervisor	15	5	80
Professional	16	5	79
Technician	14	4	81
Direct employee/production	16	11	73
Indirect employee/maintenance	16	12	72

Table 7

Themes Addressed in Personnel Training in Quality Control and Processes

	% OF THEMES ADDRESSED	
THEMES	**YES**	**NO**
Pareto analysis	69	31
Charts for variables control	74	26
Histograms	89	11
Sampling statistics	81	19
Charts of control per attributes	63	37
Data Stratification	70	30
Cause-Effect Histogram	89	11
Sampling for acceptance	72	28
Adjustments to implement CEP	58	42
Probability Histograms	49	51
Dispersion diagrams	57	43
Use of CCP in microcomputers	44	56

Table 8

Interest in Updating of Knowledge of Quality Management

ITEM	ISSUES	Degree of interest
1	Directive formation	2.67
2	Payback Systems	3.21
3	Human Resources Management	3.02
4	Quality Assurance	3.26
5	Materials, supply, and distribution management	3.22
6	Maintenance management	3.17
7	Operation/processes management	3.20
8	Sites management	2.80
9	Development of products/services/processes	3.02
10	Methodologies/technologies of analysis/management control	2.39

References:
4 = Very interested
3 = Somewhat interested
2 = Unsure/uncertain
1 = Of little interest
0 = Not interested at all

Table 9

Responsibility for the Critical Dimensions in Quality Management (Transnational)

CRITICAL DIMENSION	HEAD OFFICE (%)	SUBSIDIARIES (%)
High management support	45	55
Information on quality	44	56
Project of products and processes	60	40
Processes management	26	74
Labor Management	14	86
Participation and integration of suppliers	24	76
Participation and integration of clients	20	80
Rewards and incentives for quality	16	84

Table 10

Hindering Factors Faced for the Success in Quality

FACTOR	RELATIVE IMPORTANCE
Lack of proper formation	2.07
Fail in complying with the practices and procedures established	2.29
Little communication between management levels	2.15
Lack of individual responsibility	2.05
Delayed delivery of material by suppliers	2.65
Practices of the company incompatible with the quality targets	2.06
Lack of clearly defined quality criteria	2.11
Non-availability of the best equipment	2.52
Lack of enough personnel	2.55
Excessive concern with costs	2.51
Outdated technology	2.71
External economic factors	2.79

References:

1 = Very harmful
2 = Harmful
3 = Medium impact
4 = Low impact
5 = Non-harmful
6 = Uncertain

Table 11

Difficulties for the Success in the Implementation of Quality Management

ITEM	ISSUES	C (%)	T (%)	O (%)	R (%)
1	High management support	21	48	32	10
2	Payback systems	31	16	37	17
3	Human resources management	27	20	38	15
4	Quality assurance	26	16	39	19
5	Materials, suppliers, and distribution management	17	20	38	26
6	Maintenance management	13	29	31	27
7	Operations/processes management	27	26	33	13
8	Sites management	12	24	36	27
9	Development of products/services/processes	34	14	32	20
10	Methodologies/technologies of analysis/management control	31	19	34	17

References:

C = Lack of knowledge and/or **C**omprehension
T = Lack of **T**ime
O = Lack of **O**rganization and/or procedure
R = Lack of **R**esources or personnel

Table 12

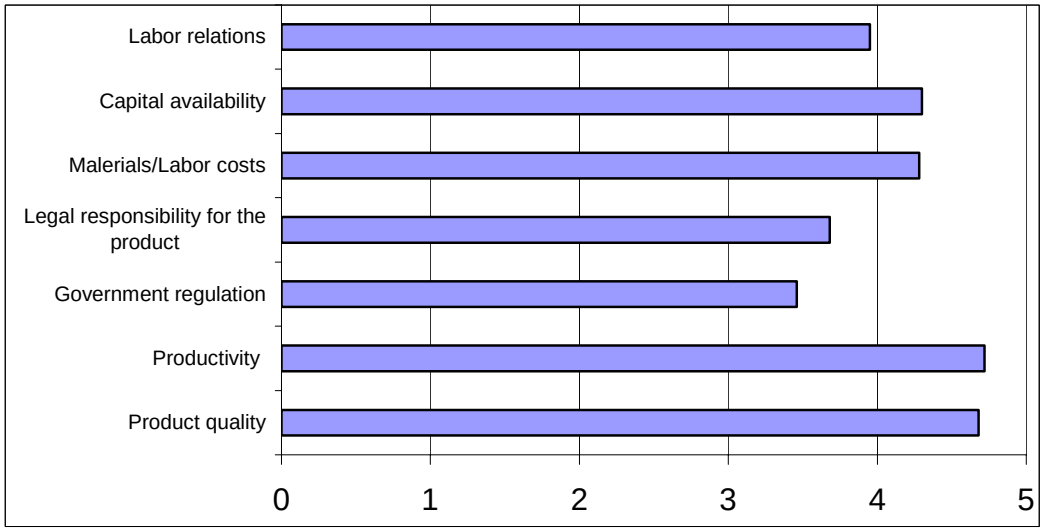
Advantages Originated from the Quality System

ADVANTAGENS	% OF ANSWERS
% OF TOTAL SALES	
Less then 5%	21
5-10%	28
11 - 19%	19
20 - 29%	6
30 - 39%	0
40 - 49%	0
50% or mores	3
Uncertain/does not know	23

XI. ANNEX II - PICTURES

Figure 1

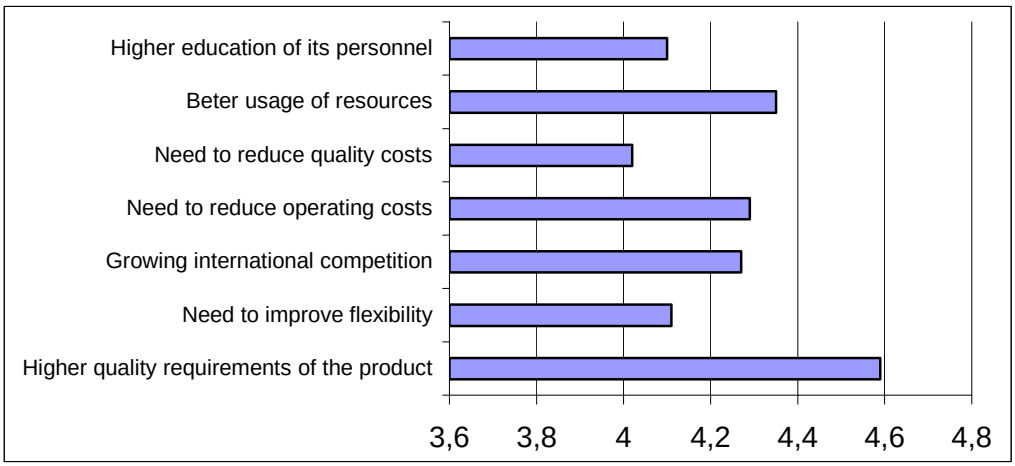
Factors of Success, Survival, and Growth (Next Five Years)



References:
1 = Very low importance
2 = Low importance
3 = Medium importance
4 = High importance
5 = Very high importance
6 = Unsure

Figure 2

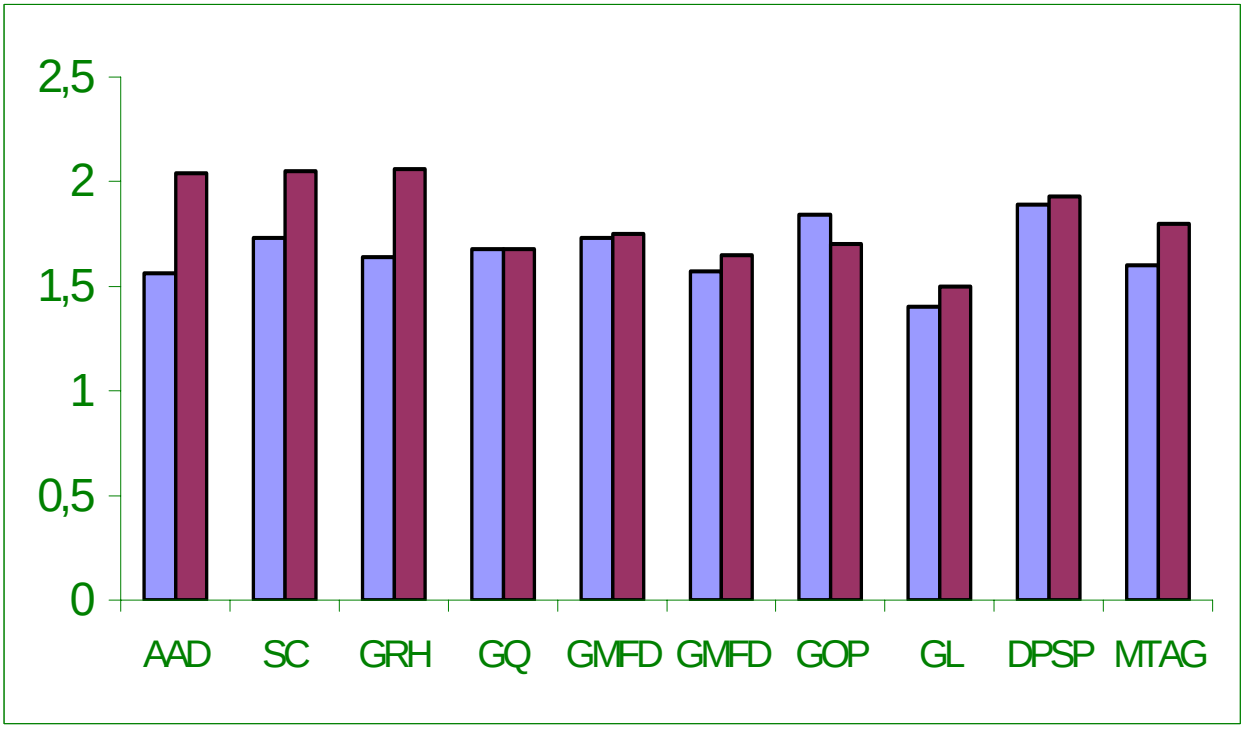
Quality Drivers



References:
1 = Very low importance
2 = Low importance
3 = Medium importance
4 = High importance
5 = Very high importance
6 = Unsure

Figure 3

Degree of Difficulty of Implementation in the Quality Programs and Actions (Short and Long Run)

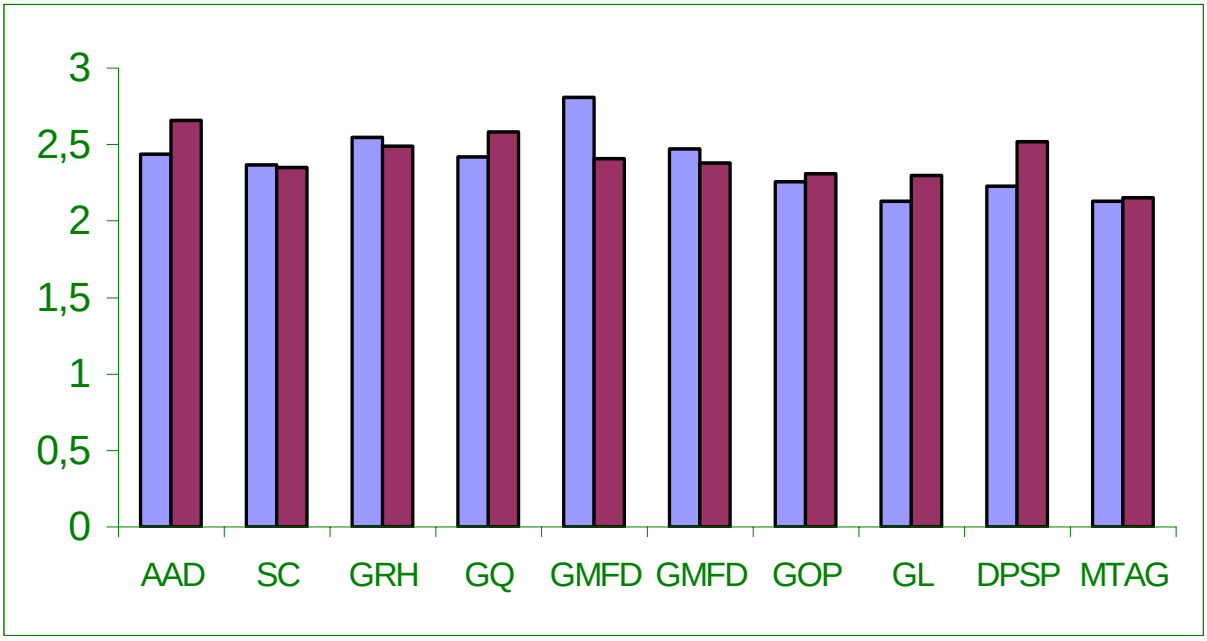


References:

AAD	High management support
SC	Payback systems
GRH	Human resources management
GQ	Quality assurance
GMFD	Materials, suppliers, and distribution management
GM	Maintenance management
GOP	Operations/processes management
GL	Sites management
DPSP	Development of products/services/processes
MTAG	Methodologies/technologies of analysis/management control

Figure 4

Degree of Utility of Quality Programs and Actions (Short and Long Run)

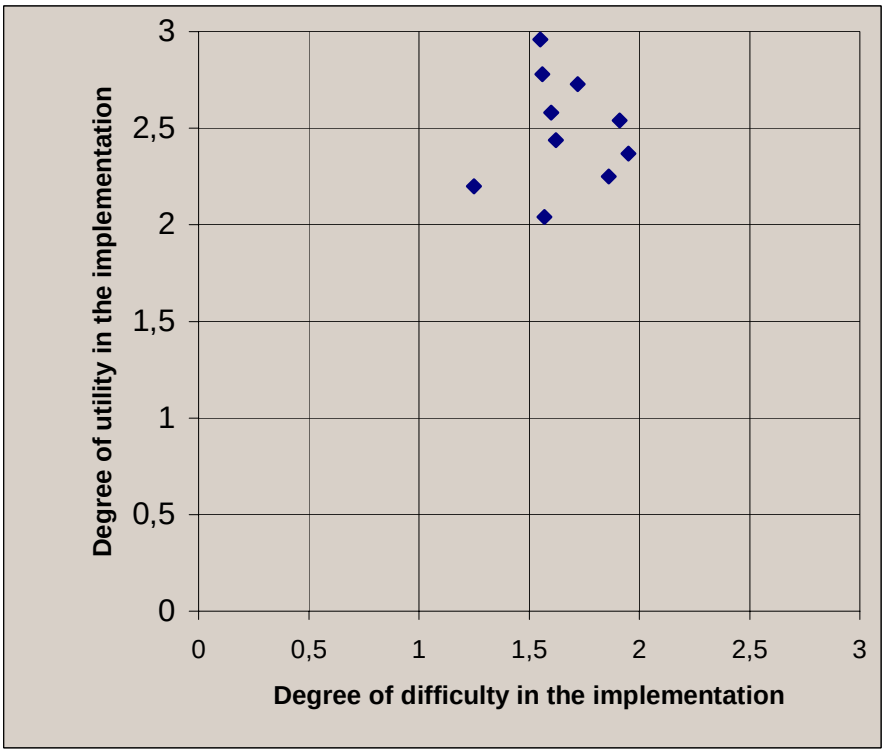


References:

AAD	High management support
SC	Payback systems
GRH	Human resources management
GQ	Quality assurance
GMFD	Materials, suppliers, and distribution management
GM	Maintenance management
GOP	Operations/processes management
GL	Sites management
DPSP	Development of products/services/processes
MTAG	Methodologies/technologies of analysis/management control

Figure 5

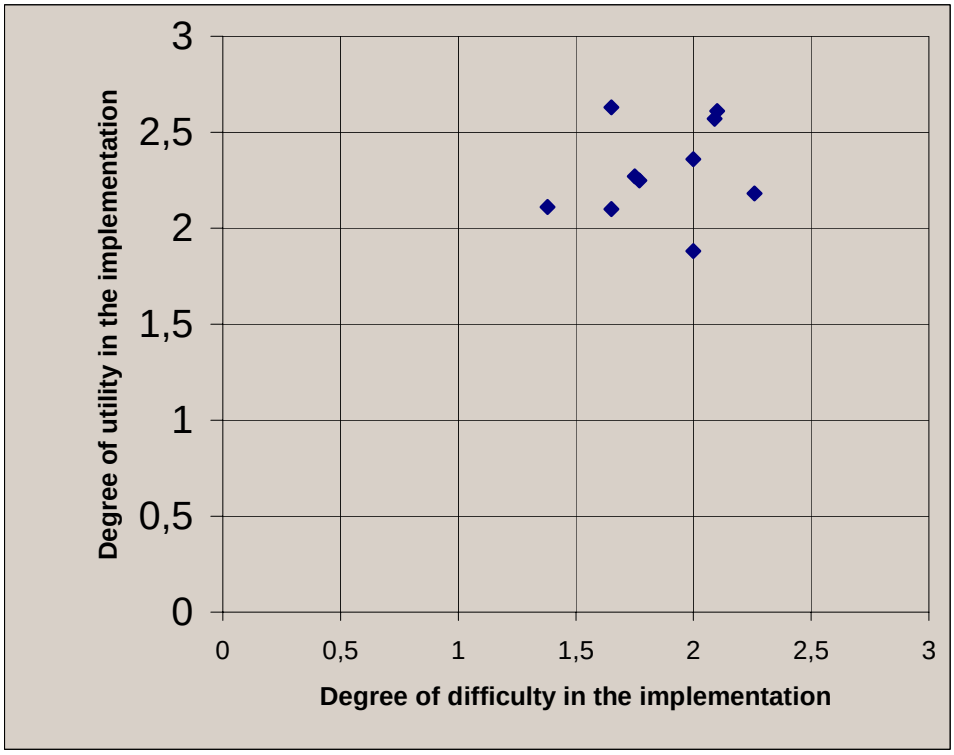
Quality Management: Situation in the Short Run



Programs	*Reference*	*Difficulty*	*Utility*
High management support	1	1.72	2.73
Payback systems	2	1.95	2.37
Human resources management	3	1.60	2.58
Quality assurance	4	1.56	2.78
Materials, suppliers, and distribution management	5	1.55	2.96
Maintenance management	6	1.62	2.44
Operations/processes management	7	1.86	2.25
Sites management	8	1.25	2.20
Development of products/services/processes	9	1.91	2.54
Methodologies/technologies of analysis/management control	10	1.57	2.04

Figure 6

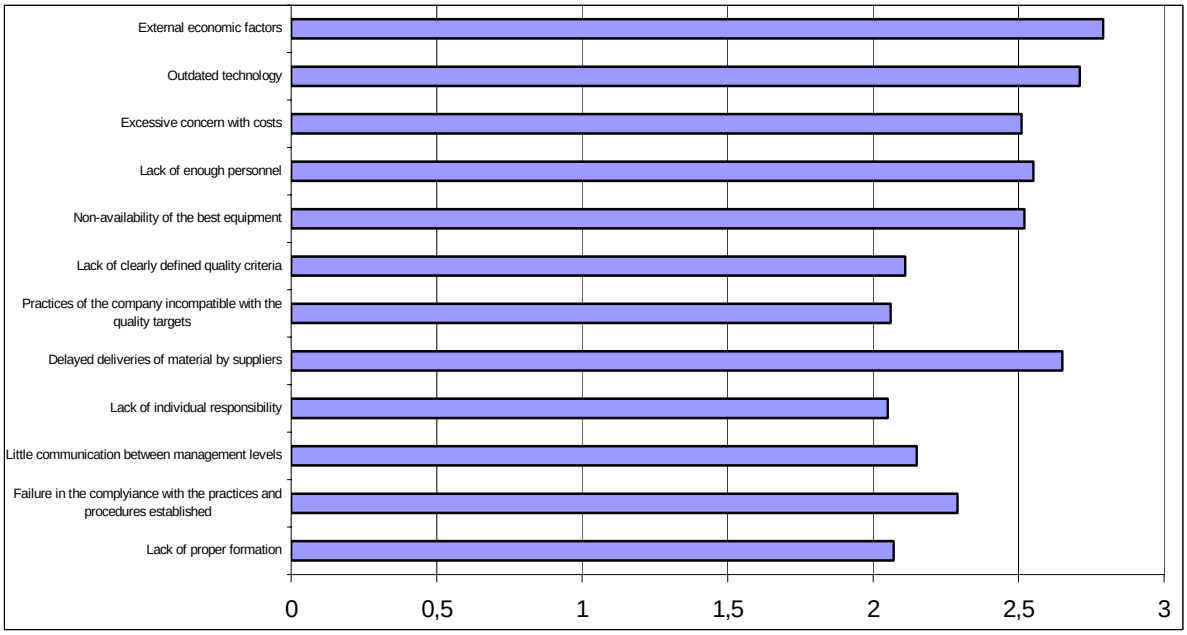
Quality Management: Situation in the Long Run



Programs	*Reference*	*Difficulty*	*Utility*
High management support	1	2.09	2.57
Payback systems	2	2.26	2.18
Human resources management	3	2.00	2.36
Quality assurance	4	1.65	2.63
Materials, suppliers, and distribution management	5	1.77	2.25
Maintenance management	6	1.75	2.27
Operations/processes management	7	1.65	2.10
Sites management	8	1.38	2.11
Development of products/services/processes	9	2.10	2.61
Methodologies/technologies of analysis/management control	10	2.00	1.88

Figure 7

Hindering Factors and Difficulties Faced for the Quality Success



References: 1 = Very harmful 2 = Harmful 3 = Medium impact 4 = Low impact
5 = Non-harmful 6 = Uncertain

XII. ANNEX III - QUESTIONNAIRE ON QUALITY MANAGEMENT IN BRAZIL

1. Profile of the interviewed person:

1.1 Full name:
1.2 Position:
1.3 Experience in quality management (years):

2. Organization:

2.1 Name of the organization:	
2.2 Director:	
2.3 Telephone:	2.4 Fax:

3. Organization headquarters (if applicable):

3.1 In Brazil:
3.2 Worldwide:

4. Organization size:

	In Brazil	Worldwide
4.1 Number of employees		
4.2 Turnover (R$)		

5. Name / Job Description / Department responsible for quality management in the organization:

5.1 Name of the department:
5.2 Main responsibility:
5.3 Department/Position it reports to directly:
5.4 Department/Positions that report to it directly:

6. Description of the product, technology and service (check each segment with an X on the number that best describes the typical activities of the organization)

Segment 1

nº		Type of technology
1		Joining/Assembling
2		Mechanical transformation
3		Biological/chemical conversion
4		Foundry
5		Casting
6		Extractive
7		Others (please describe)

1	Publicity/promotion/public relations
2	Communication/information
3	Publishing/printing
4	Banking/finance/insurance
5	Data processing/software
6	Health care
7	Consulting/auditing/counseling
8	Education/formation
9	Legal/management
10	Research/engineering
11	Real estate
12	Fashion/design/art
13	Leisure/entertainment
14	Hotel/travel/restaurants
15	Distribution
16	Retail sales
17	Wholesale sale
18	Transports
19	Repairs/maintenance/recovery
20	Public services (electricity, gas, etc) – please specify
21	Government services
22	Others (please describe):

Segment 2

nº	Line of product
1	Electric/Electronic -Machines/Materials
2	Metal-mechanic parts/components
3	Precision Instruments
4	Motors/Turbines
5	Auto vehicles/Transports
6	Industrial and agriculture machines
7	Plastics/Rubber
8	Chemicals/Oil
9	Pharmaceutical
10	Steel/Ferrous and non-ferrous metals
11	Composed materials
12	Ores
13	Construction Materials/ceramic/stone/clay/glass
14	Paper/Pulp e derivatives
15	Wood articles/Furniture manufacturing
16	Food and derivatives products
17	Textiles/Fabric/Wool
18	Leather and shoes
19	Construction – residences /commercial buildings
20	Construction – Infra-structure
21	Games and toys
22	Others (please describe)

7. Operations description

(check with an X on the number that best describes the typical operations of your company):

Types of operation	
1	High volume, repetitive, light product.
2	High volume, repetitive, heavy product
3	High volume, non repetitive.
4	Low volume, non repetitive, light product.
5	Low volume, non repetitive, heavy product.
6	Low volume, repetitive.

8. To what extend you consider that the following factors are important to the success, survival, and growth of your company in the next 5 years?

(Check one alternative for each factor, according to the following scale):

1	Very low
2	Low
3	Medium

4	High
5	Very high
0	Uncertain

Factor		**1**	**2**	**3**	**4**	**5**	**0**
1	Product quality						
2	Productivity						
3	Government regulations						
4	Legal responsibility for the product						
5	Cost of materials and labor						
6	Capital availability						
7	Labor relations						
8	Others (please describe)						

9. Which are the factors you repute most important to the growth of quality management in the next 5 years?

(Assess the importance of each factor checking with an X, according to the scale below):

1	Very low
2	Low
3	Medium

4	High
5	Very High
0	Uncertain

Factor	**1**	**2**	**3**	**4**	**5**	**0**
1.Higher quality requirements of the product						
2.Need to increment flexibility						
3.Higher education of your clients						
4.Higher buying power of your clients						
5.Growing national competition						
6.Growing international competition						
7.Globalization of operations						
8.Creation of the ECM, Mercosul						
9.Short life cycle of your product						
10.Non existence of copyrights in your products						
11.Need of differentials against competition						
12.Dificulties of purveying						
13.Dificulties of distribution						
14.Growth/Inflation of operating costs						
15.Growth/Inflation of quality costs						
16.Need to reduce operating costs						
17.Need to reduce quality costs						
18.Better usage of resources						
19.Development of new management techniques						
20.Development of new technologies						
21.Oportunities offered by computers/ communication						
22.Higher education of your personnel						
23.Changes in the legal environment						
24.Environmental factors						
25.Others (please specify)						

10. Assessment of actions and programs for the Quality Management.

Below are detailed programs and actions employed in the modern enterprise, and we wish to know the frequency, importance, and main typical usage level of these management tools in your company

(Evaluate the following programs and actions used in your company using the corresponding number to each column, according to the 3 keys below, whenever applicable):

Frequency (F)	
Never	0
Seldom	1
Annual	2
Quarterly	3
Monthly	4
Weekly	5
Daily	6

Importance (I)	
None	0
Scarce	1
Optional	2
Mandatory	3
Critical	4

Level (N)	
Line personnel	1
Direct Supervisor	2
Local Manager	3
Division Staff	4
Corporate Staff	5
In all levels	6
Uncertain/ Does not know	0

Programs and actions	F	I	N
1. Support of the high management			♦
Managerial formation			♦
Long term quality goals			♦
Active participation of the management			♦
Quality policies evolution			♦
2. Compensation systems			
Competitive basic wage			
Generic fringe benefits			
Quality oriented incentives			
Others (please specify)			
3. Human resources management			
Quality circles			
Personnel interviewing			
Information broadcasting/internal communiqués			
High technician/worker rate			
Establishment of “internal” clients			
Zero faults programs			
Organization cultural change program			
Employees training			
Good relations with unions			
Others (please specify)			

Programs and actions	F	I	N
4. Quality Assurance			
Statistical control/inspection of lots			
Statistical control of processes			
Capacity analysis of processes			
Pareto Charts			
Cause-effect charts			
Histograms and control charts			
ISO 9000 norms application			
Benchmarking			
Clients integration			
Suppliers/Distributors integration			
Quality costs			
Quality function unfolding			
Others (please specify)			
5. Materials management, supplying, and distribution:			
Suppliers qualification			
Computer organized scheduling/stock control			
Transporters qualification			
High materials stocks			♦
Distributors qualification			
Suppliers/Transporters/Distributors integration			
Packaging modulation/standardization			
Better suppliers' control			
Just-in-time supplying			
Others (please specify)			
6. Maintenance management			
Maintenance employees training			
Operations employees maintenance training			
Maintenance outsourcing			
Suppliers training			
High raw material/replacements stock			
Predictive/preventive maintenance programs			
Documents Mechanization/computerizing			
Scheduling mechanization/computerizing			
Others (please specify):			

Programs and actions	F	I	N
7. Operations/processes management:			
Tasks modulation/standardization			
Tasks simplifying			
Tasks flexibilization			
Equipment flexibility			
Equipment/processes streamlining			
Operations automation/mechanization			
Just-in-time operations			
Transparency/clarity of the operation priorities			
Close supervision			
Thorough methods and standards			
Establishment of fixed tasks			
Personnel flexibility			
High stocks in process			♦
Operations/work flows analysis			
Performance measurement of operations/employees			
Redesign of fixed work posts and functions			
Benchmarking			
Group technology			
CAPP/ CAM/ CIM/ FMS			
MAP/ TOP			
Others (please specify):			
8. Sites management:			
Better internal distribution/accesses to sites/exits of sites			
Posts/accesses/exits signaling			
Environment control - lighting/noise/temperature/air conditioning			
Modulation/equipment ergonomics/furniture			
Regular inspection of the external/internal look			
Others (please specify):			

Programs and actions	F	I	N
9. Development of products/services/processes:			
Consumer participation			
CAD/ CAM			
Simultaneous engineering			
Use of prototypes/pilot proofs			
Ergonomics			
Benchmarking			
Taguchi Methods			
Value analysis/engineering			
Cost/benefit analysis			
Selection of high/low contact services			
Equipment Higher/lower costs			
Better technology			
Others (please specify):			
10. Methodologies/analysis technologies/management control			
Mathematical models for decision and forecasting			
Computer aided decision making models			
EDI (Electronic Data and Information Interchange)			
Mechanical vision/bar-code reading			
Remote communication			
Information accessibility/utility/simplifying			
Others (please specify):			

11. Degree of difficulty of programs and actions for quality management.

We detail below some programs and actions used in the modern enterprise, and we would like to know the degree of difficulty found in the use of these management tools in your company:

(Use the scale below, checking the corresponding column)

	Degree of difficulty
N	None
S	Simple
R	Routine
C	Complex

Timeframe
Short term: 0 to 6 months
Medium term: 6 months to 2 years
Long term: more than 2 years

Programs and actions	Short term				Med. term				Long term			
	N	S	R	C	N	S	R	C	N	S	R	C
1. Support of the high management												
Active participation of the management												
Quality policies evolution												
2. Compensation systems												
Quality oriented incentives												
3. Human resources management												
Quality circles												
Personnel interviewing												
Internal information/communication diffusion												
High technician/worker rate												
Establishment of “internal” clients												
Zero faults program												
Organizational culture change program												
Employees training												
Good relations with unions												
Others (please specify)												
4. Quality Assurance												
Statistical control/inspection of lots												
Statistical control of processes												
Capacity analysis of processes												
Pareto Chart												
Cause-effect charts												
Histograms and control charts												
ISO 9000 norms application												
Benchmarking												
Clients integration												
Suppliers/Distributors integration												
Quality costs												
Quality function unfolding												
Others (please specify)												

Programs and actions	N	S	R	C	N	S	R	C	N	S	R	C
5. Materials management, suppliers, and distribution												
Suppliers qualification												
Computer aided scheduling/stock control												
Transporters qualification												
Distributors qualification												
Suppliers/Transporters/Distributors integration												
Packaging modulation/standardization												
Better suppliers' control												
Just-in-time supplying												
Others (please specify)												
6. Maintenance management												
Maintenance employees training												
Maintenance training for operations employees												
Maintenance outsourcing												
Suppliers training												
Predictive/preventive maintenance programs												
Documents Mechanization/computerizing												
Scheduling Mechanization/computerizing												
Others (please specify):												
7. Operations/processes management												
Tasks modulation/standardization												
Tasks simplifying												
Tasks flexibilization												
Equipment flexibility												
Equipment/processes streamlining												
Operations automation/mechanization												
Just-in-time operations												
Transparency/clarity of operations priorities												
Personnel flexibility												
Operations/work flows analysis												
Performance measurement of operations/employees												
Redesign of physical and functional work posts												
Benchmarking												
Group technology												
CAPP/ CAM/ CIM/ FMS												
MAP/ TOP												
Others (please specify)												

Programs and actions	N	S	R	C	N	S	R	C	N	S	R	C
8. Sites management												
Better internal distribution/accesses to sites/sites exits												
Posts/accesses/exits signaling												
Environment control: lighting/noise/temperature/air conditioning												
Elimination of doors/walls/divisions												
Modulation/equipment ergonomics/furniture												
Regular inspection of the internal/external look												
Others (please specify)												
9. Development of products/services/processes												
Consumer participation												
CAD/ CAE												
Simultaneous/concurrent engineering												
Use of prototypes/pilot proofs												
Ergonomics												
Benchmarking												
Taguchi Methods												
Value analysis/engineering												
Cost/benefit analysis												
Selection of high/low contact services												
Equipment Higher/lower costs												
Better technology												
Others (please specify)												
10. Methodologies/analysis technologies/management co												
Mathematical models for decision making and forecasting												
Computer aided decision making models												
EDI (Electronic Data/Information Exchange)												
Mechanical vision/bar-code reading												
Remote communication												
Information accessibility/utility/simplification												
Others (please specify):												

12. Types of difficulties found by your company to accomplish Quality Management programs/actions.

(Check all the kinds of difficulties found, using the key described below. Do not limit yourself to a checking per line)

Types of difficulty	Key
Lack of knowledge and/or understanding	**C**
Lack of time	**T**
Lack of Organization and/or procedure	**O**
Lack of Resources and/or personnel	**R**

Programs and/or actions	C	T	O	R
1. Support of the high management				
Managerial formation				
Long term quality goals				
Active participation of the management				
Quality policies evolution				
2. Compensation systems				
Basic wage				
Fringe benefits				
Quality oriented incentives				
3. Human resources management				
Quality circles				
Personnel interviewing				
Internal information/communication diffusion				
High technician/worker rate				
Establishment of “internal” clients				
Zero faults program				
Organizational culture change programs				
Employees training				
Good relations with unions				
Others (please specify)				
4. Quality Assurance				
Statistical control/inspection of lots				
Statistical control of processes				
Capacity analysis of processes				
Pareto Charts				

Programs and/or actions	C	T	O	R
Cause-effect charts				
Histograms and control charts				
ISO 9000 norms application				
Benchmarking				
Clients integration				
Suppliers/Distributors integration				
Quality costs				
Quality function unfolding				
Others (please specify)				
5. Materials management, suppliers, and distribution				
Suppliers qualification				
Computer aided scheduling/stock control				
Transporters qualification				
Distributors qualification				
Suppliers/Transporters/Distributors integration				
Packaging modulation/standardization				
Better suppliers' control				
Just-in-time supplying				
Others (please specify)				
6. Maintenance management				
Maintenance employees training				
Operations employees maintenance training				
Maintenance outsourcing				
Suppliers training				
High raw material/replacements stock				
Predictive/preventive maintenance programs				
Documents Mechanization/computerizing				
Scheduling Mechanization/computerizing				
Others (please specify)				
7. Operations/processes management				
Tasks modulation/standardization				
Tasks simplifying				
Tasks flexibilization				
Equipment flexibility				
Equipment/processes streamlining				
Operations automation/mechanization				

Programs and/or actions	C	T	O	R
Just-in-time operations				
Transparency/clarity of operations priorities				
Personnel flexibility				
High stocks in process				
Operations/work flows analysis				
Performance measurement of operational/employees				
Redesign of physical and functional work posts				
Benchmarking				
Group technology				
CAPP/ CAM/ CIM/ FMS				
MAP/ TOP				
Others (please specify)				
8. Sites management				
Placement/internal distribution/accesses to sites/sites exits				
Posts/accesses/exits signaling				
Environment control: lighting/noise/temperature/air conditioning				
Elimination of doors/walls/divisions				
Modulation/equipment ergonomics/furniture				
Regular inspection of internal/external look				
Others (please specify)				
9. Development of products/services/processes				
Consumer participation				
CAD/ CAE				
Simultaneous/concurrent engineering				
Use of prototypes/pilot proofs				
Ergonomics				
Benchmarking				
Taguchi Methods				
Value analysis/engineering				
Cost/benefit analysis				
Selection of high/low contact services				
Equipment Higher/lower costs				
Better technology				
Others (please specify)				

Programs and/or actions	C	T	O	R
10. Methodologies/analysis technologies/management control				
Mathematical models for decision making and forecasting				
Computer aided decision making models				
EDI (Electronic Data/Information Exchange)				
Mechanical vision/bar-code reading				
Remote communication				
Information accessibility/utility/simplifying				
Others (please specify)				

13. Which government policies and/or programs would help to improve Quality Management in your company and/or activity area?

(Check as many answers as you consider pertaining)

Policies / programs	Short term	Long term
Higher investment in basic education		
Higher investment in technical/professional education		
Better general education programs		
Improvements in the physical infrastructure		
Fiscal incentive to investment		
Fiscal incentives to the development of new technologies and/or products		
Fiscal incentives to the formation of personnel by the enterprise		
Moderate credit for development and formation		
Promotion of scientific/professional sponsoring		
Flexibility of the work market		
Privatization Programs		
Others (please specify)		

14. Quality Management performance indices used by your company.

(Indicate its use checking according to the four keys described below, using the corresponding number to each column)

Degree of importance (I)	Key
Essential	4
Important	3
Relevant	2
Of some relevance	1
Not important	0

Current auto assessment (A)	Key
Worldclass	4
Above the average	3
Close to the average	2
Below the average	1
Failing	0

Relative change in performance (C)	Key
Improving	2
No change	1
Worsening	0

Relative future importance (F)	Key
More important	2
Equally important	1
Less important	0

Indicators	I	A	C	F
1. Product development curve				
2. Client service level				
3. Processing time for orders and commands				
4. Delivery time/answer to demands				
5. Number of complaints/claims from clients				
6. Number of reference from clients				
7. Number of correct procedures				
8. Post sales follow up/activities				
9. Specifications compliance				
10. Degree of program fulfillment				
11. Consumer/market surveys				
12. Use of equipment/sites				
13. Productivity of resources				
14. Stocks turnover				
15. Material waste				
16. Use of the personnel				
17. Worker efficiency				
18. Personnel turnover				
19. Personnel absenteeism				

Indicators	I	A	C	F
20. Personnel attitudes index				
21. Suppliers and outsourcers compliance				
22. Transporters compliance				
23. Unit cost of the final product/service				
24. Budget deviations				
25. Quality costs				
26. Service costs due to warranties				
27. Number of quality inspections/audits				
28. Return on investment/assets				
29. Profitability				
30. Sales volume				
31. Sales growth				
32. Others (please describe)				

15. Evolution of programs and actions for quality performance improvement.

In this section, there is a number of programs and actions employed for performance improvement. Please indicate in the next page table, which you consider as of utility more/less immediate in relation to the tables below:

	Utility degree
I	Useless
P	Of little use
M	Moderately useful
U	Very useful

Time frame
Short term: 0 to 6 months
Medium term: 6 months to 2 years
Long term: more than 2 years

	Short term				Med. term				Long term			
Programs and actions	**I**	**P**	**M**	**U**	**I**	**P**	**M**	**U**	**I**	**P**	**M**	**U**
1. Support of the high management												
Managerial formation												
Long term quality goals												
Active participation of the management												
Quality policies evolution												
2. Compensation systems												
Competitive basic wage												
Generic fringe benefits												
Quality oriented incentives												

Programs and actions	Short term				Med. term				Long term			
	I	P	M	U	I	P	M	U	I	P	M	U
3. Human resources management												
Quality circles												
Personnel interviewing												
Information broadcasting/internal communiqué												
High technician/worker rate												
Establishment of “internal” clients												
Zero faults programs												
Organization cultural change program												
Employees training												
Good relations with unions												
Others (please specify)												
4. Quality Assurance												
Statistical control/inspection of lots												
Statistical control of processes												
Capacity analysis of processes												
Pareto Charts												
Cause-effect charts												
Histograms and control charts												
ISO 9000 norms application												
Benchmarking												
Clients integration												
Suppliers/Distributors integration												
Quality costs												
Quality function unfolding												
Others (please specify)												
5. Materials management, supplying, and distribution:												
Suppliers qualification												
Computer organized scheduling/stock control												
Transporters qualification												
High materials stocks												
Distributors qualification												
Suppliers/Transporters/Distributors integration												
Packaging modulation/standardization												
Better suppliers’ control												
Just-in-time supplying												
Others (please specify)												

	Short term				Med. term				Long term			
Programs and actions	**I**	**P**	**M**	**U**	**I**	**P**	**M**	**U**	**I**	**P**	**M**	**U**
6. Maintenance management												
Maintenance employees training												
Operations employees maintenance training												
Maintenance outsourcing												
Suppliers training												
High raw material/replacements stock												
Predictive/preventive maintenance programs												
Documents Mechanization/computerizing												
Scheduling mechanization/computerizing												
Others (please specify):												
7. Operations/processes management:												
Tasks modulation/standardization												
Tasks simplifying												
Tasks flexibilization												
Equipment flexibility												
Equipment/processes streamlining												
Operations automation/mechanization												
Just-in-time operations												
Transparency/clarity of the operation priorities												
Close supervision												
Thorough methods and standards												
Establishment of fixed tasks												
Personnel flexibility												
High stocks in process												
Operations/work flows analysis												
Performance measurement of operations/employees												
Redesign of fixed work posts and functions												
Benchmarking												
Group technology												
CAPP/ CAM/ CIM/ FMS												
MAP/ TOP												
Others (please specify):												

Programs and/or actions	Short term				Med. term				Long term			
	I	P	M	U	I	P	M	U	I	P	M	U
8. Sites management												
Better internal distribution/accesses to sites/sites exits												
Posts/accesses/exits signaling												
Environment control: lighting/noise/temperature/air conditioning												
Elimination of doors/walls/divisions												
Modulation/equipment ergonomics/furniture												
Regular inspection of the internal/external look												
Others (please specify):												
9. Development of products/services/processes												
Consumer participation												
CAD/ CAE												
Simultaneous/concurrent engineering												
Use of prototypes/pilot proofs												
Ergonomics												
Benchmarking												
Taguchi Methods												
Value analysis/engineering												
Cost/benefit analysis												
Selection of high/low contact services												
Equipment Higher/lower costs												
Better technology												
Others (please specify):												
10. Methodologies/analysis technologies/management c												
Mathematical models for decision making and forecasting												
Computer aided decision making models												
EDI (Electronic Data/Information Exchange)												
Mechanical vision/bar-code reading												
Remote communication												
Information accessibility/utility/simplification												
Others (please specify)												

16. (Only for transnational companies). Where is located the responsibility for the following critical dimensions of Quality Management in your company? (Please indicate just one check per line)

Critical dimension	Headquarters	National subsidiaries
Support of the high management		
Information on quality		
Product/process design		
Processes management/direction		
Labor management/direction		
Suppliers participation/integration		
Clients participation/integration		
Quality oriented rewards/incentives		

17. Contribution of programs and actions to the improvement of the organizational performance.

In this section, there is a number of programs and actions used to improve quality performance. Please indicate as from the next page, which of them you consider as of greater utility to quality and other goals, regarding the following tables (do not limit yourself to checking just one line and/or column):

	Contribution A:
Q	Better quality
C	Lower costs
F	Greater flexibility
E	Better delivery

Time frame
Short term: 0 to 6 months
Medium term: 6 months to 2 years
Long term: more than 2 years

Programs and actions	Short term				Med. term				Long term			
	Q	C	F	E	Q	C	F	E	Q	C	F	E
1. Support of the high management												
Managerial formation												
Long term quality goals												
Active participation of the management												
Quality policies evolution												
2. Compensation systems												
Competitive basic wage												
Generic fringe benefits												
Quality oriented incentives												

Programs and actions	Short term				Med. term				Long term			
	Q	C	F	E	Q	C	F	E	Q	C	F	E
3. Human resources management												
Quality circles												
Personnel interviewing												
Information broadcasting/internal communiqués												
High technician/worker rate												
Establishment of “internal” clients												
Zero faults programs												
Organization cultural change program												
Employees training												
Good relations with unions												
Others (please specify)												
4. Quality Assurance												
Statistical control/inspection of lots												
Statistical control of processes												
Capacity analysis of processes												
Pareto Charts												
Cause-effect charts												
Histograms and control charts												
ISO 9000 norms application												
Benchmarking												
Clients integration												
Suppliers/Distributors integration												
Quality costs												
Quality function unfolding												
Others (please specify)												
5. Materials management, supplying, and distribution:												
Suppliers qualification												
Computer organized scheduling/stock control												
Transporters qualification												
High materials stocks												
Distributors qualification												
Suppliers/Transporters/Distributors integration												
Packaging modulation/standardization												
Better suppliers’ control												
Just-in-time supplying												
Others (please specify)												

Programs and actions	Short term				Med. term				Long term			
	Q	C	F	E	Q	C	F	E	Q	C	F	E
6. Maintenance management												
Maintenance employees training												
Operations employees maintenance training												
Maintenance outsourcing												
Suppliers training												
High raw material/replacements stock												
Predictive/preventive maintenance programs												
Documents Mechanization/computerizing												
Scheduling mechanization/computerizing												
Others (please specify):												
7. Operations/processes management:												
Tasks modulation/standardization												
Tasks simplifying												
Tasks flexibilization												
Equipment flexibility												
Equipment/processes streamlining												
Operations automation/mechanization												
Just-in-time operations												
Transparency/clarity of the operation priorities												
Close supervision												
Thorough methods and standards												
Establishment of fixed tasks												
Personnel flexibility												
High stocks in process												
Operations/work flows analysis												
Performance measurement of operations/employees												
Redesign of fixed work posts and functions												
Benchmarking												
Group technology												
CAPP/ CAM/ CIM/ FMS												
MAP/ TOP												
Others (please specify):												

Programs and actions	Short term				Med. term				Long term			
	Q	C	F	E	Q	C	F	E	Q	C	F	E
8. Sites management												
Better internal distribution/accesses to sites/sites exits												
Posts/accesses/exits signaling												
Environment control: lighting/noise/temperature/air conditioning												
Elimination of doors/walls/divisions												
Modulation/equipment ergonomics/furniture												
Regular inspection of the internal/external look												
Others (please specify)												
9. Development of products/services/processes												
Consumer participation												
CAD/ CAE												
Simultaneous/concurrent engineering												
Use of prototypes/pilot proofs												
Ergonomics												
Benchmarking												
Taguchi Methods												
Value analysis/engineering												
Cost/benefit analysis												
Selection of high/low contact services												
Equipment Higher/lower costs												
Better technology												
Others (please specify)												
10. Methodologies/analysis technologies/management c												
Mathematical models for decision making and forecasting												
Computer aided decision making models												
EDI (Electronic Data/Information Exchange)												
Mechanical vision/bar-code reading												
Remote communication												
Information accessibility/utility/simplification												
Others (please specify):												

18. In your opinion, which is the estimate impact of quality costs in your company in relation to the annual sales turnover?

(Check the range of figures that seems more adequate to yourself)

Quality costs	% total sales turnover
Less than 5%	
5 - 10 %	
11 - 19 %	
20 - 29 %	
30 - 39 %	
40 - 49 %	
50 % or more	
Uncertain/ does not know	

19. In your opinion, which are the most harmful factors to the achievement of a high quality in your company?

(Check your answer in the next page, according to the table below)

1	Very harmful	4	Low impact
2	Harmful	5	Not harmful at all
3	Medium impact	6	Uncertain

	Factor	1	2	3	4	5	6
1	Lack of proper formation						
2	Emphasis of the management in the program compliance						
3	Fail in following the established practices and procedures						
4	Fail in communicating changes in design, specifications, etc.						
5	Client's scheduling requirements						
6	Poor quality of material supplied by suppliers						
7	Poor communication between management levels						
8	Lack of individual responsibility						
9	Delayed material delivery by suppliers						
10	Company practices incompatible with the Quality goals						
11	Poor performance personnel						
12	Lack of clearly defined quality criteria						
13	Conflicting quality standards						

	Factor	1	2	3	4	5	6
14	Lack of data/measurements/information on quality						
15	Inconsistent or unfair application of the established norms						
16	Non-realist contract specifications						
17	Vague, non-uniform terminology in communiqués/instructions						
18	Problems short sight						
19	Non-availability of the best equipment						
20	Lack of enough personnel						
21	Excessive concern with costs						
22	Inefficient use of sites						
23	Employees attitudes						
24	Organization culture						
25	Outdated technology						
26	Unions						
27	External economic factors						
28	Others (please specify)						

20. To what extent you consider that the application of techniques/concepts of Quality Management will condition the skills and formation required from employees of your company in the next 5 years?

(Check one of the alternatives, according to the following scale)

1	Very low
2	Low
3	Medium

4	High
5	Very high
0	Uncertain

21. Which is the degree of interest of your company in updating knowledge and skills in the following themes of Quality Management? (Please indicate your interest through the following key; check one answer per line)

Degree of interest	Key
Very interested	4
Somewhat interested	3
Unsure/ Uncertain	2
Of little interest	1
Not interested at all	0

Themes	4	3	2	1	0
1. Managerial formation					
Long term quality goals					
Quality policies evolution					
2. Compensation systems					
Quality oriented incentives					
3. Human resources management					
Quality circles					
Internal information/communication diffusion					
Establishment of “internal” clients					
Zero faults programs					
Organization cultural change program					
Employees training					
Good relations with unions					
Others (please specify):					
4. Quality Assurance					
Statistical control/inspection of lots					
Statistical control of processes					
Capacity analysis of processes					
Pareto Charts					
Cause-effect charts					
Histograms and control charts					
ISO 9000 norms application					
Benchmarking					
Clients integration					
Suppliers/Distributors integration					
Quality costs					
Quality function unfolding					
Others (please specify)					

Themes	4	3	2	1	0
5. Materials management, supplying, and distribution:					
Suppliers qualification					
Computer aided scheduling/stock control					
Transporters qualification					
Distributors qualification					
Suppliers/Transporters/Distributors integration					
Packaging modulation/standardization					
Better suppliers' control					
Just-in-time supplying					
Others (please specify):					
6. Maintenance Management					
Maintenance outsourcing					
Suppliers training					
Predictive/preventive maintenance programs					
Documents Mechanization/computerizing					
Scheduling mechanization/computerizing					
Others (please specify):					
7. Operations/processes management					
Tasks modulation/standardization					
Tasks simplifying					
Tasks flexibilization					
Equipment flexibility					
Equipment/processes streamlining					
Operations automation/mechanization					
Just-in-time operations					
Transparency/clarity of operation priorities					
Personnel flexibility					
Operations/work flows analysis					
Performance measurement of operations/employees					
Redesign of physical and functional work posts					
Benchmarking					
Group technology					
CAPP/ CAM/ CIM/ FMS					
MAP/ TOP					

Themes	4	3	2	1	0
Others (please specify):					
8. Sites management					
Better internal distribution/accesses to sites/exits of sites					
Environment control - lighting/noise/temperature/air conditioning					
Modulation/equipment ergonomics/furniture					
Others (please specify):					
9. Development of products/services/processes					
Consumer participation					
CAD/ CAM					
Simultaneous engineering					
Ergonomics					
Benchmarking					
Taguchi Methods					
Value analysis/engineering					
Cost/benefit analysis					
Selection of high/low contact services					
Others (please specify):					
10. Methodologies/ analysis techniques/ management control					
Mathematical models for decision making and forecasting					
Computer aided decision making models					
EDI (Electronic Data/Information Exchange)					
Others (please specify):					

22. Which is the present curricula level and the typical experience of the personnel of your company in the Quality area? (Please check the alternative(s) in the table below)

Education level	Key
Basic general education	**G**
Medium level career	**Nm**
Superior level career	**Ns**
Master	**M**
PhD	**Dr**

Position level	Typical education					Typical experience (years)		
	G	Nm	Ns	M	Dr	1+	4+	7+
Corporate Staff								
Divisional Staff								
Local Manager								
Direct Supervisor								
Line employee								

23. Which percentage of your company personnel has already been trained in quality issues?

Position level	Percentage trained
Corporate staff	
Divisional Staff	
Local manager	
Direct Supervisor	
Professional	
Technician	
Direct employee- production	
Indirect employee-maintenance	

24. Which themes are addressed in the training of your personnel in Quality Control and Processes (CQP)?

Theme	Addresses	
	Yes	No
Pareto Analysis		
Control chart per variables		
Histograms		
Sampling statistics		
Control charts per attributes		
Data stratification		
Cause-effect diagram		
Sampling for acceptance		
Adjustments to implement PCE		
Probabilities distributions		
Dispersion Diagrams		
Use of PCC in microcomputers		
Others (please specify):		

25. Which function within your company manages/administers/supervises quality training?

Function	Responsible for the training
Quality	
Production/ operations	
Finance/ accounting	
Marketing	
Human Resources	
Administration	
Others (please specify)	

The questions 26 and 27 regard your recruiting practices for first line supervisors, and junior technical/professional positions in your Quality Department.

26. Habitually you (Please circle your answer.)

Use only internal promotion? YES NO
Contract only externally? YES NO
Use both options? YES NO

27. Do you require an university degree as prerequisite to contract? (Please circle your answer.)

YES NO

If the answer is affirmative, which are your preferred titles?

1st preference: _____

2nd preference: _____

3rd preference: _____

28. Which of the following options you would use to satisfy the formation needs of your employees in Quality Management? (Check the preferred options in the different levels)

One or more options may be checked per line or column

	Corporate Staff	**Divisional Staff**	**Intermediate Managers**	**Supervision**	**Line Workers**
Medium level career					
Superior level career					
Master					
PhD					
Short courses					
In-Company courses					
Seminars					
Posts rotation					
Internal formation					
Others (please describe them)					

29. Would you like to receive a copy of the results of this survey?

YES ____

NO ____

If Yes please fill the following form:

Send results to:	
Telephone: Fax:	
Address:	

30. If you have any comments on these themes, or on this questionnaire, please make your comments below:

We thank you very much for your valuable help and understanding