

## Quality Systems for Globally Competing Businesses

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### Abstract

*This research deals with the impact of the quality process on the economic and financial performance of the organizations dealing in a global business.*

*The literature review has been achieved concerning the following points revealed by many and controversial authors: - organizations being the mother of all the events of quality and their design evolution context enabling (or not) certification; - the process of the quality to be implemented usually implying the ISO norms and their conceptual and practical application in the operating process of the organization and the inherent state of art; - finally, the aim of this review pertains to the connection between the quality process in an organization and its performance - economic and financial. Some international literature review findings from the global world will be considered. From these main ideas, a model of analysis was built, from which, some interesting questions will be raised which will belong to a questionnaire to be addressed to a mix of certified Portuguese organizations in order to know if they feel that the quality process had an impact on their performance; to validate these ideas their accounts will be studied in terms of ratios that will enable some benchmarking between the precedent years and the forthcoming years of the certification. A ROQ indicator - Return on Quality, constructed under Deming, Malcolm and EFQM inspiration, will be considered as a final result of this study and it will be a measure on Quality. When enlarged to the global competing market this might allow some interesting findings for the global business.*

**Keywords:** **global business**, organization, quality process, performance, ROQ - return on quality, **global business**

**JEL Classification:** A01, A21

### Introduction

Throughout the last decades the globalization phenomenon has involved a great part of the organizations through their businesses. The big international companies move all around the world searching for more competitive resources and settle in countries that offer more advantages. All this international movement, all these international transactions are in the scope of WTO (*World Trade Organization*) ruled by international agreements. One of them is *TBT - Technical Barriers to Trade* - and considers the need for quality amongst all partners in the transaction in order to build a plain and direct common language. The need for certification is an essential assumption of survival for any business competing in the global market either from the

manufacturing or the services point of view. Examples of these are the following brands: McDonald's, Zara, Carrefour, NOKIA, ADIDAS in the outdoors global market and in the indoors one, Sonae, Jerónimo Martins as to services; as manufacturing organizations one may quote Qimonda or Lear or Microsoft in the outdoors global market and Unicer (Portuguese beer producer) or Barbosa & Almeida (Portuguese glass producer) in the indoors.

Portuguese organizations are conscious of quality as something necessary to stand in the market which nowadays has been expanding thus becoming global. So a significant growth of certified organizations (see Table 1) has occurred.

**Table 1: National/ international overview - certified organizations ISO 9001**

Global market	December 2004	December 2005	Variation %	December 2006	Variation %
World	670 399	776 608	15,8	897 866	15,6
Europe	326 895	379 937	16,2	415 169	9,2
Portugal	4 733	5 820	22,9	5 851	0,5

*Source: ISO Survey - 2006*

In 2006 there was a change of performance in the European market lowering its growth rate to 9,2 % compared to the 16,2% registered in 2005. Consequently Portuguese rate fell deeply to 0,5% compared to the previous 23%! One can see that these numbers reflect the state of art of the European economy denouncing some weaknesses in 2006. Nevertheless when reading these numbers one can ask:

- What are the main characteristics of the organizations pursuing a quality management?
- What costs and benefits emerge from quality management?
- What about the effects, in the medium term, of quality management on the competitiveness of the organization?

The general aim of this research is to study the impact of the quality process - a common benchmark in the global business - on the economic and financial performance of the organizations. Thus the literature review will consider the following matters - organization, quality process and the relation between them *v.i.z.* the quality process and the performance under an economic and financial perspective.

## Literature Review

In order to locate the referred subjects, it is important to study the way the structure of the organizations may, or not, enable the implementation of a quality management system. Thus, the theme organization will be the first to be considered. Once therein, after speaking about the mother structure that will receive the quality system and the scope of the quality process implemented according to the ISO norms - quality process, the connection between the quality process set up in an organization and its economic and financial performance will be considered and entitled quality and performance.

## Organization

The way the structure of any type of organization is shaped will be viewed in a dual perspective considering - on one hand the fundamental items of each author and, on the other hand, the assumptions of these basis (Table 2):

Table 2: Organizational structure

Author	Basis	Assumptions
Selznick (1957)	Merely administrative	Clear definition of goals and rules
Perrow (1973)	Open organization	Market is responsible for everything
Mintzberg (1979)	Operational, Strategic, hierarchy, techno structure, support staff	Interaction of these elements according to the type of activity and management
Quinn (1980)	Formal activity planning system	<i>Learning strategies</i> - strategies that can be moulded and adapted
Kanter (1994)	Lean and mean	Globalization process implies a lean and mean structure
Benson et al (1991)	External factors define the structure of the organization	Demand depends on quality and quality needs leadership and support and is connected to the structure of the organization
Germain Spears (1998)	Open system	The market shapes the structure of the organization and has effects on the quality management

Source: own

It can not be said that there is a specific way of structuring an organization that defines its success. It is a multiple mix of elements that may explain it. The organization is considered as something responsible and adaptative and the way it is structured depends at last on the market. For a long time this topic has been considered an important element of analysis. Selznick (1957) considered an organization as something ruled by a formal system of goals and procedures; this way the tasks and empowerment would be officially approved by the management, apart from the structure of the organization. For Selznick or for Perrow (1973), the way the organizations obtain a hierarchical shape depends on factors like the market, the competitiveness, the law, the work force and the available technologies. According to Mintzberg (1979) any organization is formed by five essential elements: operational, strategic, hierarchy, techno structure and the support staff and its activity depends on their interaction. While for Mintzberg, the definition of the activity seems important to define the appropriate structure, for Selznick, the structure will emerge from social reasons. Consequently, the decision

making process installed in the organization will have peculiar characteristics that should be able to accept the change and help to define a new strategy. One can remember Quinn (1980) when he considered strategy as a *learning process* with an unpredictable scope having to do with the unknown tomorrow. This construction of the decision process is considered by many authors as an accrual to the organization management. Yet it can not be considered as confusion or a kind of brainstorming - *muddling* as Linblom (1959) would call it. But something seems to be real: the market force. Benson et al (1991) considered the market as a main reason for designing the context of the organizations. In this approach Kanter (1994) says that the organizations must be lean and mean in order to adapt themselves to its dynamics. Their structure must be adaptative and able to mould itself to the changes motivated by the competitiveness of the market. Consequently the decision making process installed in the organizations will have peculiar characteristics that should be able to accept the change and help to define a new strategy. It is well known that the strategic decisions will contribute to reach the organization goals because they are a very important *kind of glue* that unites the structure of the whole hierarchy in an organization guiding it towards success (Farhangmehr, 1997). This way, through an effective decision process, the organization Mission shall be achieved. Presently when we talk about globalization we mean quality of transaction, we mean quality of management (Gravin, 1984) we mean quality of the global business. According to Germain and Spears (1998), the quality of management involves not only the structure of each organization but also the market - both internal and external- where it is placed.

The way the organization shapes its hierarchical context may enable its success but the quality process associated to a certification may be of a great help.

### **The Quality Process**

As previously mentioned, globalization is something that implies quality as an assumption of transaction. Quality is essential in the world of business in order to be competitive - from the hairdressers to the teaching institutions, including all the manufacturing entities. All these business players need a quality certificate to operate in the market. To get this quality allowance one must become familiarized with some key words such as: standardization process - either of the manufacture area or of the services sector, audits, corrective actions, failure cause and effect model. All these procedures, alive in an organization, must enable some meanness and leanness of the process thus making their management more efficient and effective. Such is the quality process. In order to obtain some force, and let us say it in other words - some power - its basis is anchored in an international pattern entitled *ISO (International Organization for Standardization)*. ISO dates back to 1945-46 - after the second World War and was created by the *WTO (World Trade Organization)* and it reflected the need of simplification felt by the world commerce where global transactions are nowadays so much referred.

Presently this approach for quality has widened its scope to the management of organizations and has the definite goal of continuous improvement. Quality process has been considered for a long time by nominee gurus such as - Deming, Juran, Ishikawa, Crosby, Taguchi - and more recent authors such as Feigenbaum, Imai, Gravin among others. All

of them agree on the fact that the secret for success stands on quality.

Yet the principles and the assumptions ruling it have some differences as can be seen in Table 3:

**Table 3: Approach and rules of the quality process**

Author	Approach	Rules
Deming (1991)	People's involvement and the culture of the organization make quality	14 principles for quality including leadership, philosophy improvement and constant personnel training
Juran (1989)	Quality is achieved through communication	Three words for quality: planning, controlling e improvement
Feigenbaum (1991)	Quality depends on the client and the market	Evaluation of quality: costs of prevention and costs of failure
Crosby (1998)	Quality is "nill defects"	It is cheaper to do well the first time
Hammer and Champy (1993)	<i>BPR - business process re-engineering</i>	The organizations must be ready to face the change through the dynamics of their process
Taguchi* (1999)	A very technical perspective of quality: quality control may show off line situations or a loss of operational capacity	Quality has three stages: system design, evaluation of its assumptions and their variation
Ishikawa (1990)	Cause - effect relation	Fishbone diagram connects the main failures of the process and their effects in order to make the right decision
Imai (1986)	Kaizen - continuous improvement	One day after the other, improving every day - a cultural revolution from the top of the organization
Taiichi** (1990)	Leanness of the process	Kanban System and Just-in-Time as methodologies to make the operative process more efficient
Gravin (1984)	Organization engagement	Quality emerges from the interaction of: performance, trust, conformity, time, esthetics and clients' expectations

\* this author is mentioned by Ferguson and Dale

Source: own

\*\* this author is mentioned by Womack et al

All these items are responsible for the success of a quality process and the above mentioned ideas are relevant items for an effective quality management system - whether the manufacture sector is considered or the services one. Any quality process looking for certification will be achieved according to a standard form - which

can be filled out in any part of the world - named ISO 9001. The main chapters of this standard are designed in order to grasp the entire organization. In a simple scheme, all the procedures will include:

<b>Input 0</b>		<b>Output 0</b>
	<b>5 Management commitment</b> Vision, Mission, Strategy	
<b>8</b> <u>Measurement, analysis and improvement</u>	<b>6 Resources</b> Human Material	<b>8</b> <u>Measurement, analysis and improvement</u>
	<b>7 Product/Service</b>	
<b>Input 1 (output 0)</b>		<b>Output 1</b>

Once the quality management system is installed, the item number 8 - measurement, analysis and improvement, is the chapter responsible for all the overcoming of the failures and necessary corrections or improvement opportunities accompanied by the respective action. These shall be accomplished in order to guarantee the quality process maintenance. This process is permanently audited as to:

- top management - management engagement
- resources - human and materials necessary for the output
- product/service - the final output of the organization

After auditing the process, this cycle will be closed once again in the beginning of item 8 - measurement, analysis and improvement this time including all the suggestions and corrections of the process. This is the continuous dynamics of the quality process - the output of a process is the input of the next one (output of moment 0 is the input of moment 1).

**The Quality and the Performance**

All around the world - in this global competing business - many authors have considered this matter of quality and it is curious to note that sometimes they agree but other times they have completely different ideas. The present research aims to identify the kind of organizations looking for certification in the global market and its relation to the economic and financial outcomes. As it can be seen through the following description the literature review includes at least the following partners of the world:

USA	EUROPE	AUSTRALIA	ASIA
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**In America** Lau and Anderson (1996) considered a three perspective approach as to the organization: the cultural and philosophic dimension, the strategic and the performance view. They have concluded that the good performance of the organization would be attained only if some indicators of performance were designed and followed on a continuous process with feedback.

One may easily see that this process of quality, if seriously undertaken, helps the organization define clear objectives that may

help to achieve a successful strategy and obtain a continuous improvement that at last will result in some accrued benefits. Wisner e Eakins (1993) decided do study the financial performance of the winners of the "Malcolm Baldrige" American award and came to findings that were a little different from Lau and Anderson. They say that the winners of this prize have good financial results not only due to the certification but also because they have a good product or service, the organization has some size and the market share is relevant. They argue, as well, that quality programmes are a mean of competitiveness that may enable financial success.

**In Europe** and in order to measure the effects of the quality management, Neergaard (1997) asked Danish companies how they managed quality and concluded that most of them were very familiar with these matters despite not having written procedures. The author stressed that the business planning should to be compared and checked with quality planning and mentioned the interest the organizations should have in identifying the business goals with those of quality.

At this point of analysis, one should remember the cultural reasons already mentioned by Lagrosen (2003) and Hofstede (2001):in the countries which in terms of culture, are less secure, business planning - starting with the quality department - would take power from the other areas and this innovation would bring some trouble to the organization management.

Lakhal, Pasin and Limam (2005) studied the impact of the management practices on the quality management and on the performance of the organization. They built an analysis model based upon the main literature ideas - management practice, main structures and basic resources, quality of the product, operational and financial performance. Their interesting findings were the following: a main reason explaining the good performance of the organization is top management engagement and commitment - through good management practices; another reason stands in the relation between the practices of the installed capacity and the motivation for the good financial performance.

Quality gurus like Crosby (1979) Juran (1989) and Deming (1982) considered quality essential for the production boom of the time (in the forties) and acknowledged that there was a direct relation between quality and the product. As to the services sector, Chapan et al. (2002) considered more than 20 studies with a connection between quality and performance and concluded that this was a true assumption for the consumer because in services there is a much closer connection to the supplier. Rust et al. (1994) confirmed the ideas of Chapan as to the services and associated them to the financial benefits.

Caruana and Pitt (1995) have considered a sample of 131 service organizations and concluded that quality has a positive effect on performance but they argue as well that it is something that the market compulses the organizations to do.

**In Australia** and adversely to these arguments Terziovski et al. (1997), after a research carried out upon 1000 Australian organizations, concluded that there is no direct connection between quality and the financial performance of the organization and that the certifications of quality they get is just for the market. This author agrees with Gore (1994) who says that the organizations look for

certification just for the market. In England and at a first glance, in contrast with all these authors defending the certification, Batchelor (1992) carried out a research upon 600 organizations in the UK but concluded that only 15% of them had some advantages from certification. Furthermore he said that these benefits were internal, thus not having any influence on the market share of the organization. In an anecdotal and drastic way, Seddon (1997) says that ISO has a negative effect on organizations.

Yet, the general common sense of management knows that a good quality control is a competitive advantage; an effective quality management system helps build a clearer operational process and reinforces the decision making process. These matters will lead to a better labour performance and to reduced costs therefore enabling better performance indicators. These will reveal better results (Heras, Casadesus, Dick, 2002). According to these authors the main ideas are as follows (Table 4).

**Table 4: The analysis of certification advantages**

ISO certification	Quality Management System	Quality improvement	Business performance	Profitability
9000 Serie	Quality management system stresses the consistency of quality	Internal quality diminishes scrap and profits labour force	Reduced costs enable better competitiveness and sales opportunities	The cost of Sales falls and Profits grow

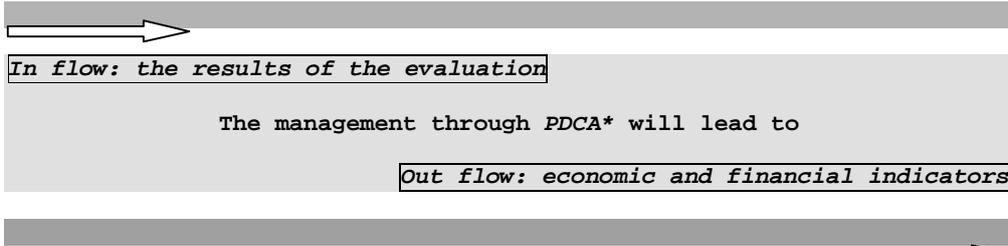
*Source: Heras et al (2002)*

A significant number of authors dealing with quality say that certification is intended and achieved just for market reasons. Gore (1994) says that this option is minimalist once it has to be achieved with the lowest cost and the highest enthusiasm. On the other hand, there are some authors (Jhones et al., 1997) who consider that certification is, on its own, a previous performance indicator. Yet these organizations show a stronger top management engagement what may enable better results than the others.

The interest considered by the International entities as to this matter should be emphasised. ISO - *International Organization for Standardization*, has issued, in September 2006, the ISO 10014 - addressed to the top management of the organizations considering the economic and financial benefits (in addition to ISO 9004 - continuous improvement).

ISO 10014 is a detailed procedure for certified organizations and it identifies the steps to follow in order to get economic and financial benefits. It deals mainly with the top management engagement and utilizes the *Deming cycle Plan Do Check Act* to make the connection between the different department decisions. In sum, its process may be drawn as follows:

ISO 10014



\*PDCA - Plan, Do, Check, Act (Deming,1982)

Source:own

This ISO's main assumptions are:

- Definition of management principles of each clause
- Goal to be reached in each clause
- Deming cycle - PDCA (plan, do check, act) - associated to each item (clause)it is explained how to reach the objectives.

It was mentioned the international standard quality rules - ISO 9001 - helps install and protect the quality process. Besides it is well known that, the quality management system has performance indicators associated to ISO 9001 implementation; the new rule ISO 10014 has considered a connection between quality and performance.

Table 5 shows some literature review on this subject through the consideration of the following points of analysis ():

- the subject and its objective
- the approach considered
- the methodology and conclusion

Table 5: Performance and Measurement

	<b>Bench- marking</b>	<b>Balanced scorecard (BSC)</b>	<b>EFQM European Model for Quality Management</b>	<b>ABC Activity Based Costing</b>
<b>Authors</b>	Karlof and Ostblom (1994);Dale (1999)	Kaplan and Norton (1996)	14 European Countries in the 80's	Johnson and Kaplan (1987)
<b>Assumptions</b>	Continuous process of comparison among the best according to good practices - efficient and effective	Strategic objectives defined through performance indicators: financial, client, process and growth	Conceptual framework composed by two motivating factors and consequent utilization within the organization to reach "excellence"	Accounting technique used to identify the activities through cost drivers. The technique ABC - activity based costing needs the ABM - activity based management
<b>Application</b>	Environment: internal, functional and competitive	In the organization	Self-evaluation of the organization; benchmarking; excellence awards; strategic formulation	Homogeneous activities with a clear output
<b>Benefits</b>	Evidence of	Measure of	Positioning of the	More accurate

	weaknesses in order to overcome them - continuous improvement	performance as a measure of management	organization in the market; initiatives for better quality are stressed	identification of the costs of activities enabling a better and easier profitability indicator
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Source: own

The goals associated to these techniques have a different scope. Benchmarking principles are applicable to any organization, once it is believed that everybody is interested in doing more and in a better way (Karlof e Ostblom, 1994).

Kaplan's (1992) suggestions summarized in the Balanced Scorecard (BSC) will fit, as well, perfectly into this quality management scope. Its assumptions are based both on the strategies design conceived to fulfil shareholders' and clients' expectations and their connection to the business process. The excellence of the organization performance will be the outcome of this process (Kaplan e Norton, 1996). Any organization thinking about the implementation of a quality management system will consider these improvement factors.

On the other side of the world, in Asia, Chinese authors Wong et al. (2006) considered that there should be a good connection between the accounting measures and the quality goals. In other words, one could say that if the organizations adopt BSC principles and if the accounting measures are ascertained with the quality process, the goals of the organization will be easily reached.

This fact has to do with specific personnel training as to quality matters what should be a prior worry for the top management of the organizations (Dillard e Tinker, 1996). The implementation of BSC will depend on the available efficient and effective human resources as well as any measure of performance. The ABC (Activity Based Costing) costing technique, based on the cost of the activities through the identification of the cost drivers (Johnson e Kaplan, 1987), may be a precious help in the definition of the quality process and activities. Together all these factors can help the organization in search of success.

Recent studies from all over the world confirm these ideas: in Turkey (Tutuncou, KucuKusta, 2007) a study is done considering the relationship between organizational commitment and EFQM business excellence. The authors conclude: leadership, partnerships and resources, policy and strategy, people development and involvement are the determinants of the organization commitment; in China, Wu and Hung (2007) studied a causal model for linking performance measures that achieve the strategic objectives of the organization and considered the measurement criteria toward each performance perspective of a balance scorecard in cause-related marketing; in Spain a research (Sanguesa, Mateo, Iizarbe, 2007) done in order to know the choose of Quality Management System for Hospitals concluded that ISO 9001 is the most representative tool followed by EFQM and by the Joint Commission. To end up this journey around the world as to quality and change movement associated we must go to Greece where Dervisiotis (2007) says that in this global competing business the only way for an organization to survive and succeed as a social "species" is to become

adaptive to emerging conditions - a new imperative for the 21<sup>st</sup> century.

The *European Model for Quality Management* will translate the implementation of the Quality Management System (under ISO 9001 or 14001) into results for the organization (its success) and the society; besides, the Malcolm Baldrige Award, in America, and the Deming Prize, in Japan, are some good products from quality belonging to the global business.

An indicator such as *ROQ - Return on Quality* will be considered as a combination of different benchmarks and may help define the accrued value of the quality process in the organization. The new ISO 10014:2006 will also allow some important clues on this matter.

### **Methodology**

This research aims to make the connection between the quality certification process and the financial benefits of any organization placed in the global market. The empirical analysis may (or may not) confirm these trends referred to in the literature review. The way to do it and the contents of the means designed to reach the above mentioned objectives are described in the chapter methodology which will include not only the definition of the model of analysis but also the parameters used for the development of the case study.

### **Model of analysis**

Most relevant literature quotations were used to build some analysis assumptions.

From the chapter *organization* it was clear that the quality process seems to contribute, in some way, to a better hierarchical shaping of the organizations. This means that fundamental management tasks like planning, directing, organizing and controlling need a strong leadership in order to aggregate all the decisions to allow coping with the strategies that will enable the Mission of the organization. From the chapter *quality process* many ideas were retrieved from the authors that considered the scope and benefits of the certification of the organizations in the global business.

At last the *literature review* considers the connection between quality certification and the financial performance.

In this global world we want to identify those who look for quality - what they do and how they do - and connect it to their financial performance.

### **Building the assumptions of analysis**

Yin (1994) suggests that in order to follow the ideas of the literature review, if there is an organization that comprehends it, one should carry out a case study. In summary:

<i>Approach / Cases</i>	<i>Single</i>	<i>Multiple</i>
<i>Holism (simple unit of analysis)</i>	Type 1	Type 3
<i>Specific (multiple units of analysis)</i>	Type 2	Type 4

Source: Yin (1994)

Type 1 considers the whole analysis comprehending all the approaches of a single case. Type 2 contemplates a specific theme under multiple units of analysis only applied to one case. Type 3 refers to an exhaustive analysis of a theme under a simple unit of analysis inserted in a study of multiple cases achieved the same way (assumptions). Type 4 acknowledges the study of a specific theme according to multiple units of analysis and included within the context of multiple cases.

The study case method depends on the aim of the research - deductive, inductive, generalist or specific. Multiple cases are used when an inductive and generalist approach is intended, while simple cases are used when an inductive approach and a specific explanation is needed (Yin: 1994).

#### Case study

The means of analysis capable of granting adequate information to the before mentioned assumptions, according to the scope of the proposed research is the inquiry (Yin, 1994). From this inquiry one should get the relevant data for the study.

Quivy (1995) suggests that such an analysis should be able to give an answer to the questions: what? who? how?

Following these ideas, the inquiry (see appendix 1), to be addressed to certified organizations, will consider two parts - one non financial and the other financial.

The non financial part will follow the structure of norm ISO 9001 including in its scope the most relevant authors dealt in the literature review:

- Quality Management System (nr 4 of ISO 9001) - its definition within the organization (more or less centralised, adhocratic or professional) and the decision making process associated (leadership and core competence)
- top management involvement (nr 5 of ISO 9001) - crucial steps undertaken by the management in order to implement quality
- resources (nr 6 of ISO 9001) available for quality - how are they considered in the operational management
- product or service (nr 7 of ISO 9001)- and the client's satisfaction
- measurement, analysis and improvement (nr 8 of ISO 9001)- and the continuous improvement

The financial part of the questionnaire will consider some financial indicators like sales growth, ROA and ROI along the years considered before and after the quality certification.

Μορφοποιημένο: Κουκκίδες και αριθμηση

The indicator Return on Quality - ROQ will make the connection between the non financial and financial measures being the result of their addition and meaning the "economic value added" by the process of quality undertaken by the organization.

Either under Deming or Malcolm Baldrige or EFQM scope of analysis, one should consider both the enablers and the results as coupled factors belonging to the Quality Process. EFQM model considers a distribution percentage of 50% for each - enablers and results - which seems a quite reasonable share, once results are a consequence of the measures and decisions undertaken throughout the various ways of governance and the better these are the better the results.

Based on EFQM global assumption, this indicator will be built according to the non-financial measures representing 50% and to the financial measures representing the remnant 50%, thus totalling - 100%:

$$ROQ = 50\% NF + 50\% F \text{ (as seen in table 6)}$$

$$ROQ = 50\% \sum_{i=1}^5 nf_i x_i + 50\% \sum_{j=1}^5 f_j y_j$$

Where:xi are financial variables and yj non financial variables  
nfi are non financial % weight and fj are financial % weight  
corresponding each ∑ sum up to 100%

**Table 6: Return on Quality (ROQ)- measured by Non-Financial and Financial factors**

Non financial - NF		Financial - F	
%	50%	%	50%
nf1	Quality Management System	f1	Sales (growth)
nf2	Top management involvement	f2	Net profits / Sales
nf3	Resources	f3	Net Profits / equity ROE
nf4	Product/Service	f4	Net Profit/Assets ROA
nf5	Mesurement&Improvement	f5	Equity /Total Assets

Source: own

To build this ROQ indicator, an inquiry (questionnaire) will be sent to the organizations belonging to the sample formed by certified Portuguese organizations by 2007.

In this questionnaire considering the relative (%) importance (see table 7) of the matters under analysis as to the non financial measures (nf1..nf5), each item will be rated (%) according to a model, constructed from the Deming/Malcolm Baldrige Prizes; as to the financial measures (f1..f5), this percentage will be equal for all - v.i.z. 20% for each issue thus, not influencing the final values got (Walsh, 2006).

**Table 7: Relative importance (%) of the non financial and the financial indicators - (ROQ)**

50%		50%	
From Model D/M	Non-financial - NF	From W	Financial - F
(12,5%)	Nf1/NF	(20,0%)	f1/F
(12,5%)	Nf2/NF	(20,0%)	f2/F
(20,0%)	Nf3/NF	(20,0%)	f3/F
(22,5%)	Nf4/NF	(20,0%)	f4/F
(32,5%)	Nf5/NF	(20,0%)	f5/F
100,0%		100,0%	

Source: own

The quest will be designed according to a Lickert Scale considering a qualitative and a quantitative approach.

#### **Qualitative approach - non-financial measures**

The approaches related to the Non-Financial items (nf1..nf5) consider the key factors revealed by the literature (which will be organized in a table by themes and author) as to management issues. These will be formulated in order to allow an answer according to a scale of relevance. Each great issue, nf1 for instance, may include several other issues that are relevant and are therein included in cascade.

<b>1</b> not	<b>2</b> little	<b>3</b> enough	<b>4</b> much	<b>5</b> very much
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The final value will correspond to the average value obtained, from one to five of the Lickert scale. For each group of questions for instance within the issue quality - nf1, we may include 5 questions which the organization marked respectively as: 2, 3, 4, 4 and 5; so, the final outcome for the item quality is 3,6.

The final outcome for the Non-Financial issues will be the average of all the values got from the cross rated five items.

#### **Quantitative approach - financial measures**

As to the Financial information, we shall be asking the organizations for a range of 5 to 6 years of financial data - two years prior to and three after certification. A Lickert scale will be used as well, but separately for each type of activity and for each indicator; each one will have a proper scale with minimum and maximum values defining a class - from 1 to 5. These pattern values will be collected from an official document named "Boletim Estatístico" issued by the Bank of Portugal. This Central Bank issues sectorial indicators for companies in Portugal within the specific types of activity.

The Lickert scale constructed for each indicator will depend on a sectorial normal distribution elaborated according to the mathematical concept of the Central Limit Theorem.

Some examples of what this research wants to achieve are (the numbers that follow are just an academic exercise, not an evidence of the reality):

sales growth

1 [0-0,01[	2[0,01-0,03[	3[0,03-0,05[	4[0,05- 0,075[	5[0,075- 0,15[
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return/sales

1 [0-0,015[	2 [0,015-0,03[	3 [0,03-0,05[	4[0,05- 0,075[	5[0,075- 0,10[
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return/equity

1 [0-0,03[	2 [0,03-0,05[	3 [0,05-0,075[	4[0,075- 0,10[	5 [0,10- 0,15[
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return/total assets

1 [0-0,03[	2 [0,03-0,05[	3 [0,05-0,075[	4[0,075- 0,10[	5[0,10- 0,15[
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equity/total assets

1 [0-0,10[	2 [0,10-0,15[	3 [0,15-0,175[	4[0,175- 0,25[	5 [0,25- 0,40[
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Depending on the value assumed by each indicator, the organization will fall within the class defined. Let's assume that we are only considering sales growth and that we want to see if the company performance trend has been successful or not: we will be comparing the benchmark Lickert scale defined for the specific sector of activity to the real data registered in the accounts of the company, both before certification and after and let's assume that it was 1,5% before certification and 4,5% afterwards (as can be seen in table 8)

**Table 8: Calculation of the Financial measure (before and after certification)**

Indicator	Benchmark of the sector (average of two years before certification)	Real data (average of two years before certification)	Benchmark of the sector (average of three years after certification)	Real data (average of three years after certification)
Sales growth	1[0-0,01[ 2[0,01-0,03[ 3[0,03-0,05[ 4[0,05- 0,075[ 5[0,075- 0,15[	1 <b>2 1,5%</b> 3 4 5	1[0-0,015[ 2[0,015-0,031[ 3[0,031-0,053[ 4[0,053- 0,0755[ 5[0,0755- 0,15[	1 2 <b>3 4,5%</b> 4 5

Source: own

The final value for the Financial measures will be calculated as a difference between the value of the Lickert scale before the certification and after it, under an accrued perspective. For instance, if sales were not growing before certification and after certification they registered an increase of 20%, it means that the financial measure values 5 - from 0 to 5. In the above mentioned example, in table 8, the financial measure is only 1 (difference between 3 and 2).

At last, final ROQ value (ROQ = 50% NF + 50% F) will be the sum of the two parcels, Non-Financial and Financial, not exceeding the number 5 - the maximum value of the Lickert scale defined (if an organization gets a final value of 3,5 and another 3,0, it means that the former has a better return on quality than the latter and the items that are responsible for this difference will be clearly seen).

Only after receiving data from the organizations through the questionnaire, will this indicator be tested and improved.

Yet it would be very interesting and allow some depth of analysis if there was a chance to reply this questionnaire in other countries belonging to the global business so that the conclusions might have a meaning for the global market.

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*Appendix 1*  
QUESTIONNAIRE

*Please identify your company*

Item	Description
NAME OF THE ORGANIZATION	
ADDRESS	
ZIP CODE	
TELEPHONE	
ACTIVITY	
START UP DATE	
ECONOMIC ACTIVITY BRANCH	
WORKERS ( 2007 average)	

**NF – NON FINANCIAL**

*Please answer in a scale of 1-5*

1 muito pouco	2 pouco	3 razoável	4 muito	
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*As to the following matters*

QUALITY MANAGEMENT SYSTEM				
The interest in the quality management process identification				
The commitment of top management on quality				
Top management quality aims disclosure in the organization				
The relevance of the Quality costs				
Effectiveness of controlling the information				
The interest in the Quality Manual updating and application				
The advantages of being managed by Quality				
MANAGEMENT RESPONSIBILITY				
Management shows leadership				
Management style is respected by workers				
Top management shares the information				
Team work as management culture is important				
Policy and goals for quality are publicly known				
Workers are involved in quality matters				

RESOURCES					
<i>HUMAN</i>					
Workers interest on quality is real					
Workers involvement by top management					
Quality training is well come by everybody					
Motivation in work is used for a better performance					
Competences emerging from certification are significant					
Personnel performance evaluation has an impact on productivity					
The impact of the satisfaction evaluation is important for the certification					
<i>MATERIAIS</i>					
The costs of certification are relevant and identified					
Maintenance costs of Quality are important					
Department performance after the certification has improved					
The information systems created by Quality has helped the management					
<b>PRODUCT/SERVICE</b>					
After certification the market is more steady					
The client is more satisfied with the organization after certification					
Client claims are treated accordingly having influence in the management					
Product/service certification adds value to the organization					

Product/service certification contributes to better outcomes in the organization					
<b>CONTINUOUS IMPROVEMENT</b>					
Internal auditing plan as to quality is easily fulfilled					
The non conformities statistical report is used					
Corrective actions have a plan of effectiveness					
The plans emerging from the corrective actions help the management					
After the certification management concern is the continuous improvement					
Continuous improvement is connected to the financial results of the organization					

**F – FINANCIAL**

After identifying with an X, the year of the certification, do please fill the items - two years before and three years after - as referred in the shadowed example:

If the organization got the certification in 2002, it is needed to fill the years 2000 and 2001 –two years 2003,2004,2005  
Example

Year of certification				<b>X</b>					
ITEM	1999	2000	2001	<b>2002</b>	2003	2004	2005	2006	2
SALES									
NET PROFITS									
ASSETS									
NETWORTH									
LIABILITIES									

Now, please, identify with an X the year of certification of your organization and from that data – two years backward and three forward – fill in, with values in thousand euros, the following table

<i>Year of certification</i>									
<b>Items</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>
<b>SALES</b>									
<b>NET PROFITS</b>									
<b>ASSETS</b>									
<b>NETWORTH</b>									
<b>LIABILITIES</b>									