
Benefits of ISO 9000 implementation in Spanish industry

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Abstract

The ISO 9000 standard for quality management systems was accepted by the International Organisation for Standardisation in 1987. Since then, large companies and SMEs have been obliged to open their doors to something new, "the culture of quality", a message that is very often associated with the initials of this well-known standard. Currently, there are more than 6,000 companies with this certificate in Spain, but they have not always obtained the same results. This paper gives the results of empirical research into 502 Spanish companies to determine the benefits of the implementation of this standard. By means of cluster analysis it was found that different typologies of companies exist. Also, nearly 65 per cent of the companies certified in Spain have obtained substantial internal and external benefits.

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Introduction

Although the lack of empirical research into quality management is clear, it is also true that more and more surveys of ISO 9000 are being published across the world. Despite this proliferation of surveys, Juran's criticism appears justified: most surveys merely describe the characteristics of the certified companies, analyze their reasons for ISO 9000 certification and generally reach the same conclusions (Wenmoth and Dobbin, 1994; Carlsson and Carlsson, 1996; Tsiotras and Gotzamani, 1996; Meegan and Taylor, 1997; Buttle, 1997; Jones *et al.*, 1997).

However, what are the benefits companies obtain from implementing the ISO 9000 standard? Analysis of the benefits that ISO 9000 has brought leads to much more confused and uneven results than in the above studies. For example, while some companies highlight organizational improvements, others emphasize only the marketing benefits.

A study of 160 Australian companies (Brown and Van der Wiele, 1995) found the following benefits from certification:

- increase in company quality awareness;
- increase in product quality awareness;
- improvement in management;
- improvement of customer relations;
- improvements in the products and services offered;
- improved relationships within the organization;
- greater customer satisfaction; and
- increased respect from competitors.

However, another study, carried out in the UK (Lloyd's Register Quality Assurance Ltd, 1994), summarized the benefits of certification as follows:

- an important marketing tool which helps market relations;
- increases the chances of winning new contracts;
- decreases the number of customer audits; and
- helps penetration of international markets considerably.

Since this organization is directly involved in the application of the standard, one can clearly allege considerable bias in this study. However, another study from another major consulting company (Vanguard Consulting Ltd, 1994) confirms that only 15 percent of

companies obtained the benefits that the British Standards Institution set.

The widely-differing results regarding the benefits of implementing the ISO 9000 is the reason that we ask what companies have really gained through certification. Our study focuses on Spanish industry, analyzing whether it is possible to define different types of companies by the benefits that they derive from certification.

ISO 9000 in Spanish industry

The impact of the ISO 9000 in Spain has been spectacular. At present, there are more than 9,000 certified Spanish companies, according to the latest report of the International Standardization Organization (2000). In addition, the mean growth of ISO 9000 certification in Spain is markedly higher than the European mean (Table I). It is also clear that certified companies show greater export capacity than other companies, with a greater average percentage of turnover devoted to major exports (Casadesús and Heras, 1999). It should also be added that the main reasons for Spanish companies seeking ISO 9000 certification are very similar to the reasons cited in the studies mentioned above (Casadesús and Heras, 1999).

An analysis of the fabric of Spanish industry shows that the automobile industry is important in Spain (factories owned by Ford, Renault, General Motors and the Spanish firm SEAT). Steel continues to be an important heavy industry in the Basque country. Likewise, the cotton and woolen textiles and clothing industries are significant in Catalonia. Other leading industries include chemicals, toys, shoes and electrical appliances (televisions, refrigerators and washing machines).

Undoubtedly, as Spain is one of the European countries that has recently sustained a high rate of economic growth and

has increased exports, especially to South America, it is the ideal setting for our study.

Empirical research

At the beginning of 1998 there were 4,268 certified companies in Spain, rising to 6,412 at the end of the year. Due to the vast number of companies and the difficulties involved in a study such as ours, it was decided to select a small sample of companies. All the companies in Catalonia and the Basque country certified since 1998 were included – about 1,570 companies in every sector of activity. The sample was chosen from these autonomous communities because they had more certified companies and greater diversification of activities than other communities. The fact that it was a restricted survey allowed us to conduct a more in-depth study.

This article uses the data from the study to analyze the benefits obtained by ISO 9000 certified companies. We undertook a brief descriptive analysis followed by a cluster analysis to determine whether different categories of companies in the sample could be determined. The companies included in each category had to have very similar characteristics and clear differences from companies in other categories.

In this empirical part of the study, 502 valid responses were received: 32 percent of the 1,570 companies in the initial sample. Of these, 452 were certified under the ISO 9001, 1,114 under the ISO 9002 and only four under the ISO 9003.

One of the first results arising from the sample analysis was that, initially (1993–1996), the ISO 9000 had an important effect on manufacturing companies, but in recent years many service industries had been certified. Service industries made up 37 percent of the sample.

It was also easy to see that the largest group of certified companies contained between 15

Table I Number of ISO 9000 certifications in Spain and Europe (1993–1999)

	1993	1993	1994	1995	1995	1996	1997	1998	1999
Spain									
<i>n</i>	43	320	586	942	1,492	2,496	4,268	6,412	8,699
Mean growth (%)		87	45	38	37	40	42	33	26
Europe									
<i>n</i>	23,092	37,779	55,400	71,918	92,611	109,961	143,674	166,255	190,248
Mean growth (%)		39	32	23	22	16	23	14	13

and 100 workers (38 percent), whereas the companies in the second-largest group employed between 101 and 200 workers (28 percent). Of the certified companies, 8 percent had between 201 and 300 employees. It should be added that 6 percent of the certified companies had less than 15 employees (some of them had only three or four workers).

Finally, we should highlight that the certification of companies in Spain has been mainly carried out by AENOR (57 percent) and Bureau Veritas Quality International (16 percent), and to a much lesser extent by LRQA Ltd, Lloyd's Register, LGAI, TÜV Product Service, Det Norske Veritas (DNV), SGS ICS Ibérica AEIE and ECA. Why was one certifying organization rather than another used? In over 65 percent of cases, the reasons concerned improving either: the general reputation of the certifying organization or its standing in its field. Companies needed not just to satisfy quality standards, but also demonstrate this to their customers.

Benefits of implementing ISO 9000

Unfortunately, the benefits of ISO 9000 certification are very difficult to measure by, for example, rises in productivity or increased market share (Jones *et al.*, 1997). Despite these difficulties in quantifying and measuring benefits, "internal" and "external" aspects of companies can be distinguished (Tsiotras and Gotzamani, 1996). This distinction is used in this study, as well as in other similar studies (Lloyd's Register Quality Assurance Ltd, 1994; Vloegeberghs and Bellens, 1996), for practical purposes, i.e. to help interpret the results obtained.

According to Brown *et al.* (1998), as well as Vloegeberghs and Bellens (1996), the most important benefits are internal in character:

- improved awareness of the importance of quality;
- improved awareness of the problems of the company; and
- improvement in product quality.

However, Quazi and Padibjo (1998) affirm that the most important benefits are external, with the three most important being:

- (1) increased customer satisfaction;
- (2) improvement in product quality and market competitiveness; and
- (3) satisfaction of customers' requirements.

However, the aim of this research is not to examine the relative importance of internal and external benefits, but rather to evaluate what benefits are brought by certification and analyze whether all companies benefit in the same way. To this end, internal and then external benefits are analyzed.

Internal benefits

One of the directors of a small company taking part in the study said: "The main benefit for the management of the company resides in the potential of the ISO 9000 standard for reorganizing the organization and, basically, the company's productive activity. The ISO 9000 is relied on to turn the company completely round". If this is contrasted with the empirical evidence, it can be seen that the most important internal benefits of the application of ISO 9000 in Spanish companies are as follows (in order of percentage of replies received):

- (1) improvement of the definition and standardization of work procedures (33 percent);
- (2) improvement in the definition of the responsibilities and obligations of the workers (19 percent);
- (3) increased company confidence in their quality (11 percent);
- (4) greater commitment to work (11 percent); and
- (5) improved guidelines reducing improvisation (7 percent).

Analysis of the benefits to the human resource management of the company showed two aspects in which certification had quite positive effects:

- (1) improved job satisfaction (66 percent); and
- (2) improved communication between management and employees (64 percent).

However, it could be argued that there is no case where ISO 9000 has negative effects on any of the aspects under analysis.

The most positive effect of the standard on operations management was the considerable reduction in errors and defects during the manufacturing processes (91 percent). We

also found a big improvement in the management of work orders and in confidence that they would be properly carried out (77 percent). ISO 9000 also had a positive influence on better delivery times (56 percent), the ensuing savings in production cost (52 percent) and the reduction of lead time (49 percent). The only aspect, and this was based on the comments of 13 percent of the companies, in which certification was prejudicial to companies was a certain increase in the cost of quality management. The costs saved are very difficult to evaluate, although some consultants such as SGS Yarsley (1992) affirmed that, with the savings made, 90 percent of companies recovered their investment within three years.

To sum up, although at the outset companies were motivated to seek certification mainly for external reasons, as is shown by practically every investigation (Carlsson and Carlsson, 1996; Jones *et al.*, 1997; Mo and Chan, 1997; Lee, 1998), internal consequences are clearly very important and in almost every case very positive. However, all those companies that improved productivity substantially after applying ISO 9000 have to remember that this was caused not only by the standard, but also by its implementation and the method of implementing it.

External benefits

The results of this study show that the external benefits of certification in this study are, in order of importance:

- (1) better response to customers' requirements (34 percent);
- (2) penetration of new markets (21 percent);
- (3) improved customer relations (18 percent);
- (4) improvement in customer services (16 percent); and
- (5) reduction of customer audits (8 percent).

Analysis of these findings demonstrate the enormous commercial importance and quality image offered by ISO 9000.

Three points of influence of the standard on the company's external customers can be emphasized:

- (1) the increased customer satisfaction (84 percent);
- (2) the drop in the number of complaints (58 percent); and
- (3) the rise in repeat purchasing (42 percent).

It should be noted that on the first point nearly all the companies consulted agreed.

In very few cases did certification have a negative effect on any of the aspects related to external benefits of the company, just as was found for the internal benefits. The only negative effect was the dissatisfaction of some customers due to the excessive documentation needed by the system, especially before the first review of quality system procedures. These results coincide with those of other investigations (Lloyds Register Quality Assurance Ltd, 1994).

In addition, one of the reasons that many companies became certified precisely because customers demanded it (Jones *et al.*, 1997). Later this proved to be even more of a benefit than the real improvements in products and services. The objective was realized. With ISO 9000 certification companies obtained the increase in quality image they sought, while real improvement was sometimes not so great.

The collection of customer data, a major component of high-quality management, was only undertaken by 33 percent of companies annually, 16 percent every three months, 40 percent without any set timing, and 11 percent never. The quality manager of an engineering company told us: "The review of these indicators of system quality enables their efficacy and their compliance with the aims set to be evaluated. Before, they were not monitored, which made it difficult to understand the reasons for various problems of loss of effectiveness, money or company image."

Another benefit of certification is its effect on the financial affairs of companies: 58 percent thought that the ISO 9000 had led to a considerable increase in market share, and to an upward sales trend. However, 49 percent of companies did not see any considerable increase in the rate of sales per employee, while 36 percent did not in their return on investments. In general, our results resembled those of Lloyds Register Quality Assurance Ltd (1994), which found that 49 percent of companies had benefited from certification due to their increased market share. In addition, recent studies comparing certified and non-certified companies (Haversjo, 2000) confirm that the former have better financial results than the latter.

Company type depending on the benefits of implementing ISO 9000

As well as analyzing the benefits companies obtained from ISO 9000 standard certification, we assessed company satisfaction with certification, or whether there is one category of company which considers itself to have benefited more overall than another. Whether different "groups" of companies with similar behavior regarding benefits from certification can be distinguished was analyzed through a cluster analysis, following the guidelines reproduced in the Appendix.

Before fully developing this analysis, one of its first results should be highlighted. This was the non-detection of any significant differences between companies certified recently and companies certified for over three years (first review). This apparent lack of improvement in the companies after a certain period of time corroborates the findings of Jones *et al.* (1997). Nevertheless, this lack of improvement is not supported by the results of the majority of the surveys by organizations involved in quality management, e.g. Lloyds Register Quality Assurance Ltd (1994).

Internal benefits

Cluster analysis of the internal benefits of implementing the ISO 9000 standard gave two clearly distinct groups of companies. The first were named "companies with high internal benefits" (HIB) and the second "companies with moderate internal benefits" (MIB), according to criteria discussed below. Some of the most representative variables of each group are summarized in Table II, which serves as a basis for describing the two categories:

- (1) *HIB*. This group contains those companies that think they benefited significantly in most areas. It covers 79 percent, the majority of the companies. Why did these companies think they had benefited internally so much from ISO 9000 certification? Basically because, they believe, the standard:
- improved employees' satisfaction at work (78 percent);
 - improved communication between employees and managers (73 percent);

- improved safety at work (57 percent);
- decreased quality costs (78 percent); and
- increased stock rotation (50 percent).

Moreover, 74 per cent of the companies recognized a decrease in their costs having applied ISO 9000. It should be remembered that most companies in this grouping (69 percent) recognized the important role played by the state in quality management in Spain.

- (2) *MIB*. This second category consists of the remaining 21 percent of companies which, though also satisfied with the standard's internal benefits, considered them much more moderate. Why do we affirm that these benefits are more moderate? If we analyze some of the same variables discussed above for the other group, we find that the satisfaction figures for internal benefits are much lower. However, there was practically no company that thought it had been prejudiced internally by certification. For example, only 40 percent recognized improved job satisfaction, and 17 percent an improvement in stock turnover. Only 14 percent stated they had saved on costs, while 29 percent affirmed they had increased costs.

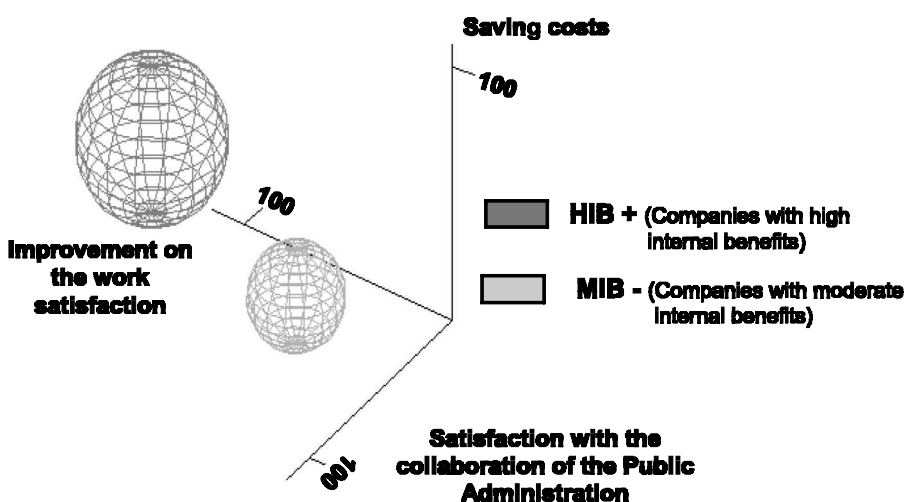
To clarify the differences and similarities between HIB and MIB and to find the number of companies in each category, a fictitious graph (Figure 1) of three representative variables was designed, although this does not imply that they are the most important or outstanding variables. Each variable is represented by an axis from 0, at which the said variable has minimal effect, up to 100 at which the said variable has maximum effect. The different types of companies or clusters are represented by a sphere whose co-ordinates are the mean of the three variables of the companies which form part of it and which has a volume proportional to the number of companies within the cluster.

External benefits

Two categories were also defined in the analysis of the external benefits of implementing ISO 9000. We called these companies with high external benefits (HEB) and companies with moderate external benefits (MEB). Some figures were

Table II Two typologies of companies depending on the internal benefits of ISO certification

	HIB (%)	MIB (%)
Companies of any typology	79	21
Companies with benefits from certification	97	77
Companies that feel the need for an expansion of the ISO norms	84	43
Companies that believe that government has an important role in quality management	69	37
Companies that believe that ISO 9000 has a positive influence concerning		
Work satisfaction	78	40
Safety at work	57	49
Suggestion system	73	49
Absence from work	14	9
Salaries of workers	52	20
Safety and reliability	75	57
On-time delivery	63	63
Order processing	87	74
Number of errors or defects	94	83
Stock rotation	50	17
Quality costs	78	34
Cost savings	74	14
Attention of the companies to quality assurance compared with before certification		
Much more	55	43
Somewhat more	36	43
About the same	9	14
Somewhat less	0	0
Satisfaction of companies with ISO 9000		
Very satisfied	24	20
Satisfied	68	57
Indifferent	5	11
Dissatisfied	3	9
Very dissatisfied	0	3

Figure 1 Typologies of companies depending on internal benefits

very similar to the internal benefits figures: 71 percent of the companies made up the group of those more satisfied with the external benefits of certification, and 29 percent less so. Table III shows some of the

more significant variables for the two groups, which are discussed below:

- (1) *HEB*. The companies making up this group were the ones most satisfied with the external benefits of the standard. On

what grounds? In 95 percent of cases customer satisfaction was thought to have improved, in 86 percent the number of complaints had been reduced, 82 percent increased market share, and 80 percent increased sales. In almost 100 percent of cases, companies recognized that they had benefited externally from certification, with good quality management valued much higher than before.

- (2) *MEB*. This second grouping comprised 29 percent of companies. These companies obtained a lower level of external benefits than companies in the first grouping. For example (see Table III), the number of complaints was reduced in only 45 percent of cases, and market share was increased in only 17 percent. More in-depth analysis of the companies in this group shows they were the least satisfied with the application of the standard and complained about it most (excessively bureaucratic, high cost, unsuitable for small companies, etc.).

Figure 2, designed in a similar manner to Figure 1, analyzes the groups of companies by their external benefits.

In short, the results of the analyses of the internal and external benefits of ISO 9000 certification led to parallel conclusions. In both cases, two types of companies were distinguished:

- (1) a majority group of companies who had benefited most from certification; and
- (2) a minority group who, although they also had a certain level of improvement, received only moderate benefits.

It is important to emphasize that in neither of the two analyses was there any group of companies in which the effects of the ISO 9000 could be considered negative or too small to be significant.

If we represent the four types of companies in only one graph (Figure 3), distinguishing the companies in each category, we clearly see that 65 percent of the companies benefited considerably, internally and externally, from ISO 9000 certification, whereas 15 percent considered that the improvements had little relevance. The remaining 20 percent was divided between 14 percent who thought they had obtained important internal improvements but not external ones, and 6 percent who thought just the opposite.

Table III Two typologies of companies depending on the external benefits of ISO 9000 certification

	HEB (%)	MEB (%)
Percentage of companies of any typology	71	29
Companies with benefits from the certification	99	79
Companies that feel the need for an expansion of the ISO norms	70	85
Companies that believe that government has an important role in quality management	71	38
Companies that believe that ISO 9000 has a positive influence concerning:		
Customer satisfaction	95	75
Number of complaints	86	45
Number of repeat purchases	75	17
Market share	82	17
Sales per employee	68	6
Return on assets	95	2
Return on sales	80	13
Attention paid by the companies to quality assurance as compared to before certification		
Much more	58	40
Somewhat more	23	49
About the same	9	11
Somewhat less	0	0
Satisfaction of companies with ISO 9000		
Very satisfied	27	17
Satisfied	55	67
Indifferent	5	9
Dissatisfied	3	4
Very dissatisfied	0	3

Figure 2 Typologies of companies depending on external benefits

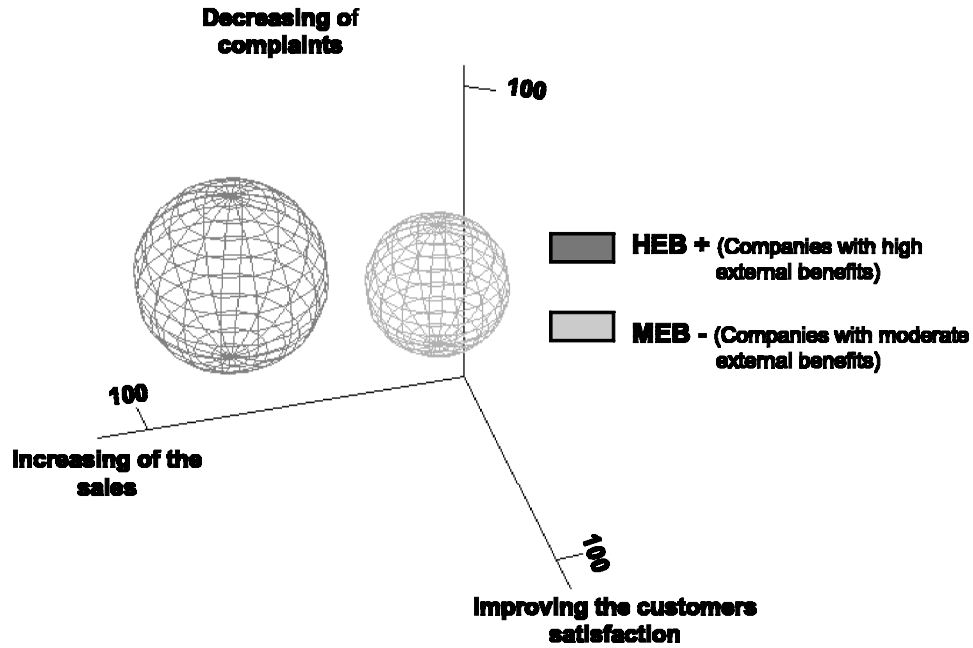
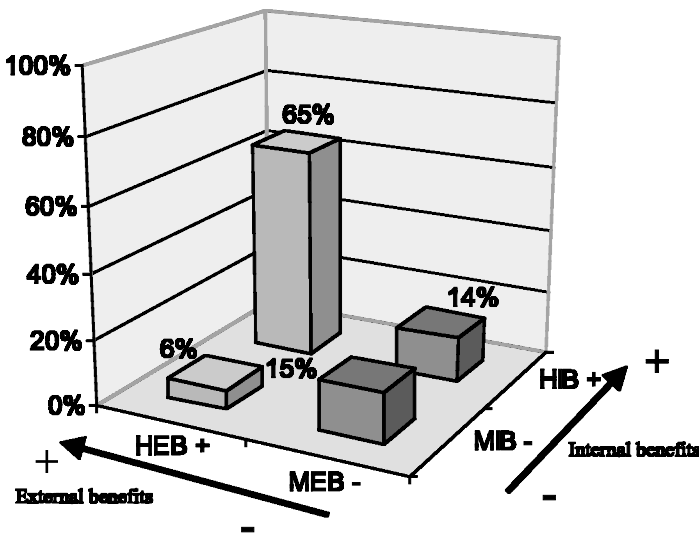


Figure 3 Typologies of companies depending on the levels of internal and external benefits



Conclusions

Nowadays, despite the considerable growth of certifications, many companies have become aware of the restrictions and weaknesses of ISO 9000: they have seen how the standard can become simply an objective to be complied with rather than a tool of great potential. It is undeniable that, although ISO 9000 has many positive points, these must be used in the right context, which

meant that not all companies were able to take advantage of this opportunity.

In addition, many companies recognized that they sought certification largely for exclusively commercial motives – increased market share, maintenance of current customers, image of quality offered, or even for reasons of survival – rather than with a real awareness of the need to improve business quality. The benefits of the implementation of this standard varied greatly, since most effort focused on internal improvements – interdepartmental relationships, internal organization, employee motivation – rather than improvements in the quality of products and services offered.

Companies have already implemented most of the above points, as around 91 percent believe that certification has benefited them, particularly due to the restructuring opportunity that the standard offered, and also because they became able to find just what the responsibilities of each workplace were. Also, some 96 percent believed that the ISO 9000 standard is a good system of quality assurance, although many managers believed that the standard should be extended to include environmental and industrial safety standards.

As well as describing the benefits gained by Spanish companies on receiving the ISO 9000 certificate, we defined the different types of

companies in terms of how they had benefited from this standard. To sum up, it is significant that 65 percent of companies benefited both externally and internally from the ISO 9000, while 15 percent showed much lower benefits.

Finally, we recognize that there are limitations to this type of survey that might affect the findings contained in this article, and that, to advance research into this topic, these limitations need to be included. Despite the awareness of these or other limitations, we consider that our findings can be used as an objective measure of the benefits of implementing the ISO 9000 standard.

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Appendix. Cluster analysis

Cluster analysis was used to study the different groups of companies that can be distinguished on the basis of the benefits they gained through the ISO 9000 standard. The analysis determined whether different groups of companies which were as homogeneous as possible (on the basis of the variables studied) could be distinguished from companies which were as different as possible from each other.

This article only includes the analyses with variables relating to internal and external benefits, although the initial study was much broader. In addition, only some of the over 60 variables used are included in Tables I-III.

When working with different kinds of variables (continuous, non-continuous and binary), it is not correct to use the standard-distance matrices of the most common statistical software (SPSS or Minitab) or to calculate any main components. Initially, we designed a matrix of distances reflecting similarities and differences between companies, based on the directives of Everitt (1993), to reach finally a cluster analysis.

Because there is no evidence in the literature of any similar research (cluster analysis), the results could not be compared with other results.