

The 9000 with the 9000: An analysis of the impact of the ISO 9000 standard in Catalonia

Martí Casadesús, Iñaki Heras and Stanislav Karapetrovic

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INTRODUCTION

Legend has it that when Empress Catherine of Russia travelled around the provinces of her empire in 1787, her Prime Minister Grigori Aleksandrovich Potemkin travelled one day ahead of her to prepare the false fronts of the buildings that made the miserable homes appear more prosperous and then dismounted all the supports and transported them to the next province. Since then, the term "Potemkin village" has been used to refer to apparently happy scenes which are no more than a front that has nothing to do with what is going on backstage.

Unfortunately, this analogy may be very familiar to those of us who have been fortunate enough to work in the so-called "quality movement". Of course, all that glitters is not gold and we are aware that the same can be said of the world of quality assurance management.

Even the man on the street who is not familiar with business tools has heard of the ISO 9000, which would appear to be the great paradigm of "quality". Indeed, we, as users, are sold products as if they were of great quality because they comply with this standard. And the question is: will this last forever? Or is this another management trend?

There is no doubt that, as drawn from a study carried out in Catalonia (Casadesús and Albertí, 2003), the ISO 9000 has brought many benefits to the companies that have implemented it. In fact, in recent years, the different government authorities have devoted many efforts to the standard and they have undoubtedly been very fruitful. Recently, in Catalonia, we have reached the mythical figure of 9000 certificates. Thus, we talk about "the 9000 with the 9000", which constitute the purpose of this study.

However, beyond the implementation of the standard itself, what is really important is that many managers have become aware of the importance of improving quality, which has largely contributed to improving the productivity and, of course, the competitiveness of our region's products. But is the improvement to quality over? Do we now have to go for something else? Has it been just a trend or another fashion?

In our opinion, as good monitors of the quality culture, this is just one of many major steps along the road to continuous improvement, which we hope will not be the last. Thus, for example, the ISO standards organisation has not only generated new versions of the standard every now and then (indeed, the new version is now in its final stages of preparation and is expected to be published in 2008), but it has also devoted its efforts to developing non-certifiable standards that support quality assurance management. For example, in 2004, it published the ISO 10002 standard for processing complaints and claims

and, in 2007, it is to publish another two standards from the same family: the 10001 and 10003 for customer satisfaction management. How many companies would need an effective complaints and claims management system? Most of them, of course. How many companies would need to have their systems certified by an accredited body? This is a much more debatable matter. Indeed, the very laws of the market will possibly expel those that do not deserve a place, even though they insist on demonstrating it with certificates.

There is still a long way to go and the question we need to ask ourselves is: which direction should we take? Do we implement support standards such as the so-called 10002 or less specific standards? Do we improve the functionalities of certain areas of business or do we take a step-by-step approach? The answer is not easy, but what is obvious is that, to quote Schopenhauer, "for a man who does not know which port he is sailing to, no wind is favourable".

To see which "wind" we need to follow, we carried out this study. This working document analyses a significant sample of "the 9000 with the 9000" in order to ascertain the impact the certificate has had on the said companies. We shall analyse the "wind" and discover more indicators of the road we need to follow.

To return to the matter in hand, it is obvious that Catalan companies must not become "Potemkin villages" that are substantiated by a mere certificate. Such a certificate would indeed be magical! It is clear that it may have been effective so far, but everything comes to an end and it may be reaching its own demise. We must not fall into the trap of thinking that we are able to solve everything by applying one model or tool, even less so when the model does not adapt to our reality: this is a recipe for disaster. It should be remembered that reality is usually stubborn and constant and, sooner or later, it will come up trumps. In the field of quality, you either engage or you do not.

STUDY OBJECTIVES AND METHODOLOGY

The impact of the ISO 9000 family of standards has been huge, not only in Catalonia, but also all over the world. To analyse this fact, in 1998, a team from the University of Girona, together with the Catalan Centre of Quality (CCQ) carried out an empirical study that involved the participation of 283 Catalan organisations. The results of the said work showed the positive, significant effects of the implementation of the said standard on the competitiveness and productivity of our companies. Indeed, very few companies said they were dissatisfied with its implementation.

Although it may seem obvious that these standards provide internal (improved efficiency, etc.) and external (improved fulfilment of customer requirements, etc.) benefits, since it would be difficult to understand why so many companies implement the said standards if they did not derive any advantages from them at all, what is not quite so clear is how the perception of these benefits may vary over time. In other words, it seems quite reasonable to assume that quality assurance managers overestimate the benefits provided by the ISO 9001 standard when the certificate has just been awarded, since they feel encouraged by the successful completion of project implementation. However, it would be equally true to say that as the number of certified companies increases, the importance of the "award" falls and it is no longer helpful for improving the company's competitiveness; indeed rather the opposite is true: not having it becomes a disadvantage. Of course, it is also possible that the perception of the benefits change over time.

Four years after this study had been completed, two very relevant events occurred. First of all, the family of ISO 9000 standards was reviewed in December 2000, with a clear focus on "management by processes" and "continuous improvement". Secondly, the number of companies certified in Catalonia had risen sharply. As a result, the figure rose from 1000 companies certified in 1998 to almost 4500 in 2002. On a world scale, similar trends were observed in that the number of certificates doubled and the mythical figure of 500,000 companies registered as compliant with the ISO 9001:2000 standard was reached (ISO, 2004).

In order to assess the real impact of the ISO 9000 standard in Catalonia, CIDEM carried out a new study in 2002. This study, also led by a team from the University of Girona, came up with results that were similar to those obtained in 1998, as shown in Casadesús and Alberti (2003). Using the figures from the two works, it is possible to assess the changes that have taken place in Catalonia during this time, especially the variations that have occurred.

Today, four years later, the scenario has again changed considerably. First of all, the number of certified companies in Catalonia has reached the symbolic figure of 9000, as reflected in

the title of this report. However, there may have been a more relevant change in quality than in quantity. For example, it is well known that the first companies to be certified were, in general, the largest companies in the production sector, which, at the same time, were the companies with the most resources and facilities for implementing the standard. This is probably no longer true, since more small and medium-sized companies are certified in our environment and in all kinds of sectors. However, one of the main differences in this four-year period was the appearance and subsequent implementation of many new management standards. Some of them are quite well known, such as the ISO 14001 standard for environmental management or the OSHAS 18001 standard for safety and the prevention of occupational hazards, although others are not so widely known. The analysis of the impact of these new standards and their possible integration with previous standards is another of the working objectives presented in this publication.

The main objective of the empirical work carried out and presented in this document is the assessment of the impact of the implementation of the ISO 9000 standard on Catalan companies. At the same time, it shall be used to assess how the perception of the benefits provided may have varied over time and, in particular, how these standards are integrated into one single management system, as this is one of the aspects that most concerns Catalan companies today. Accordingly, we shall gain an understanding of how Catalan companies have perceived the impact of these standardised management systems.

To carry out the empirical study required for this work, the models and questionnaires designed for the previous analyses of Catalonia in 1998 and 2002 were used. The surveys combine closed and open answers to gain a better appraisal of the companies' perception.

The report has three clearly separate sections. First of all, it analyses the Catalan companies that have only implemented the ISO 9001:2000 standard in recent years. It then studies the companies that have also implemented the ISO 14001:2004, which implies that they have gone beyond the implementation of management standards and, therefore, possibly offer a different view. In other words, they may provide more indications about the direction that will be taken by quality management in the coming years. Finally, in the last chapter and based on the data gathered, the report analyses the future of quality management in Catalonia.

1. STUDY: COMPANIES CERTIFIED IN CATALONIA AS COMPLIANT ONLY WITH THE ISO 9001:2000 STANDARD

This first section includes the descriptive figures taken from the analysis of the Catalan companies certified as compliant only with the ISO 9001:2000 standard. The aim is to describe the impact that this standard has on businesses that set out to manage quality by using a standard management system.

1.1 Profile of the study

In order to achieve the proposed objectives of the survey of companies certified as compliant only with the ISO 9001:2000 standard, it was sent to 1741 of the 7555 companies in Catalonia that had been awarded the standard. The surveys were sent to the organisations' quality assurance managers. The profile of these companies can be seen in Table 1. With a view to gaining a representative sample of the current situation in Catalonia, consideration was deliberately not given to whether or not the companies had previously taken part in the 1998 and 2002 surveys.

Date survey sent	2006
Population	Approx. 7555 companies certified as compliant with the ISO 9001:2000 standard in Catalonia
Study sample	1741 companies
Replies obtained	353 companies
Reply percentage	20%
Maximum error	4%

Table 1: Study profile: companies with the ISO 9001:2000 certificate

The main characteristics of the companies that took part in the study are described below.

- Number of employees: most of the companies that are certified as compliant only with the ISO 9001 standard have fewer than 100 workers (81%), as shown in Figure 1, whereas almost all the other companies employ between 101 and 500 workers (17%). It is clear that there are no large organisations in this group, either because there are not many in Catalonia or because the ones that exist are certified as compliant with other management standards.

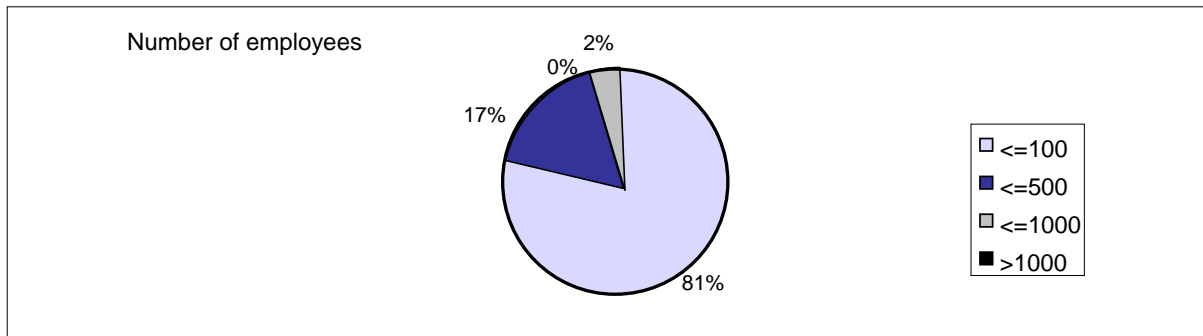


Figure 1: Number of workers at the companies certified as compliant with the ISO 9001:2000 standard.

- Economic sector: the main focus of the ISO 9001 standard in Catalonia, as clearly shown in Figure 2, is the production sector, which accounts for almost 50% of the replies obtained. It should be highlighted that the second most represented sector (13%) is the construction sector, which has increased its participation considerably in comparison with the previous survey carried out almost four years ago. Indeed, as is well known, this sector has undergone significant growth in recent years and has been involved in the introduction of many more specific or general management standards (ISO 14001, OSHAS 18001, etc.).

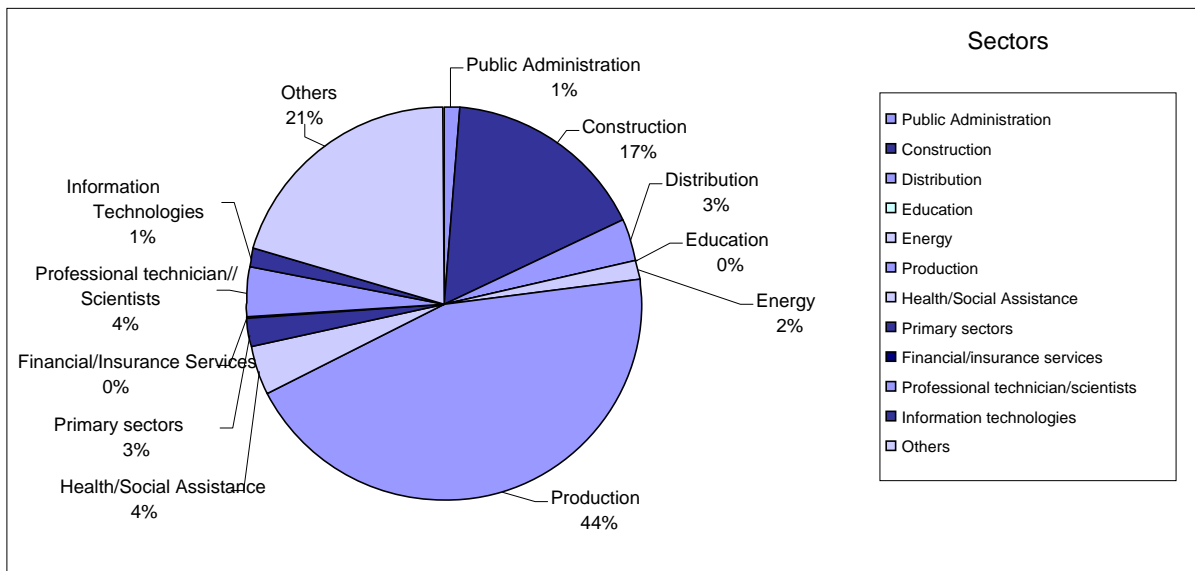


Figure 2: Economic sectors of the companies certified as compliant with the ISO 9001:2000 standard.

- External customers: Figure 3 shows that the final product of most of the companies that took part in the survey is used by another company. Only 25% of the companies that took part in the survey focused on the end consumer as their main end client. Taking these figures into account, it can be stated that it is not only necessary to

comply with certain quality standards, but importance is also placed on the party that requests the need for the corresponding management system to be certified by an independent external body.

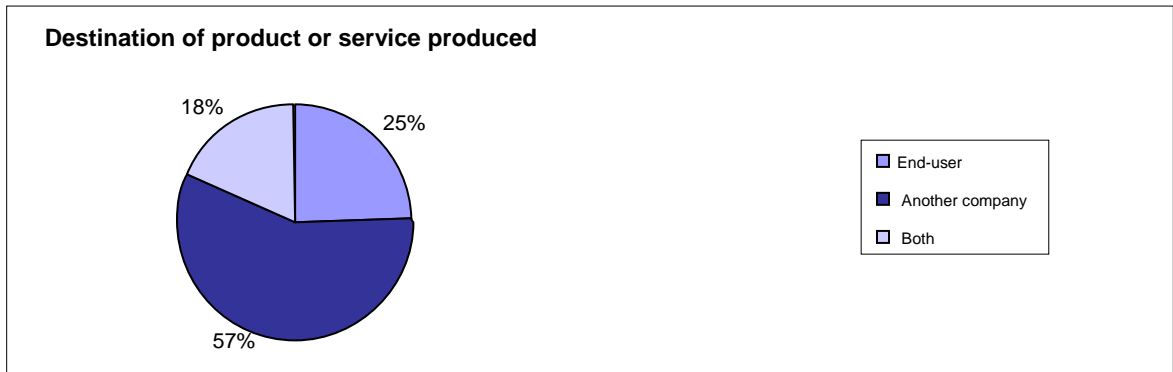


Figure 3: Destination of the goods produced by the companies certified as compliant with the ISO 9001:2000 standard.

1.2 Implementation of the ISO 9001:2000 standard

Although two of the main aspects to be analysed regarding the impact of the implementation of the ISO 9001:2000 standard ought to be time and costs, we do not have very reliable figures, except for estimates provided by the bodies involved. With regard to the implementation time of the standard (Figure 4), at present, more than 50% of Catalan companies require less than one year to implement the system and only 10% need more than two years. If we compare these results with those obtained from previous surveys, there is a considerable reduction in the time required to carry out the implementation process. Indeed, this reduction of the time required would appear reasonable if we consider that companies have increasingly more resources available to carry out the implementation process, such as new guidelines, more experienced consultants, specialised software and the fact that sector consortiums have been set up to carry out the implementation process.

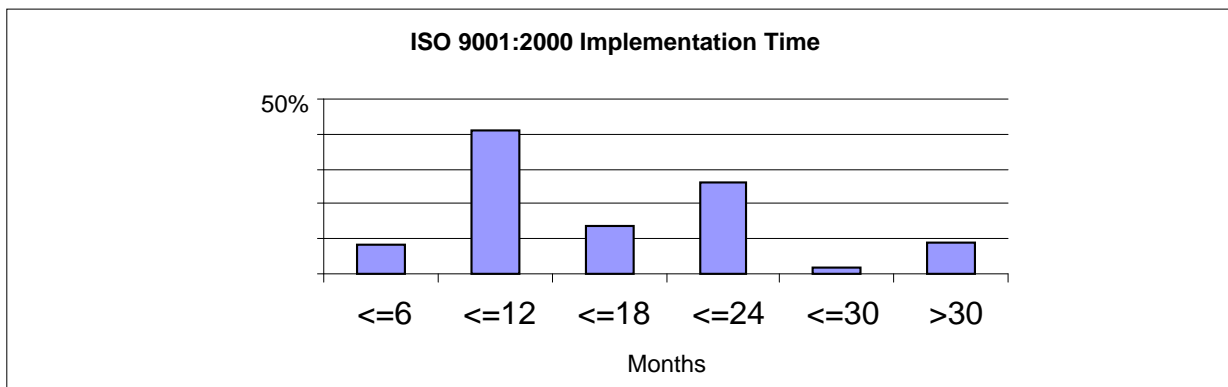


Figure 4: Period between the implementation and certification of the ISO 9001:2000.

The cost of implementing the ISO 9001:2000 standard (Figure 5) currently stands at between €6,000 and €12,000 for more than 50% of the organisations and less than €18,000 for 85%. It is evident that much care is needed when interpreting these figures, since they depend directly on the size of each organisation.

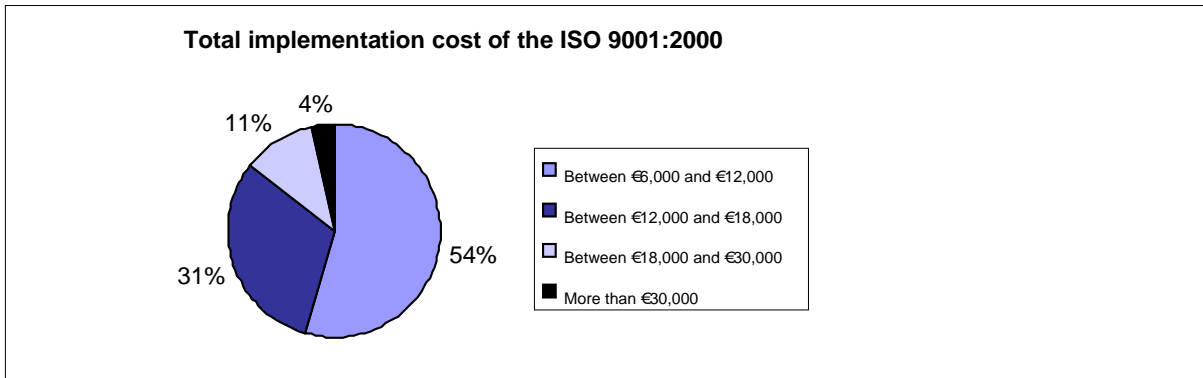


Figure 5: Cost of implementing the ISO 9001:2000 standard.

The other significant cost that must be analysed in the implementation of the standard is the system maintenance cost (Figure 6). For most organisations (86%), this cost stands at around €6,000 and €12,000 per annum. Only 6% of the companies state that they have a maintenance cost of over €18,000.

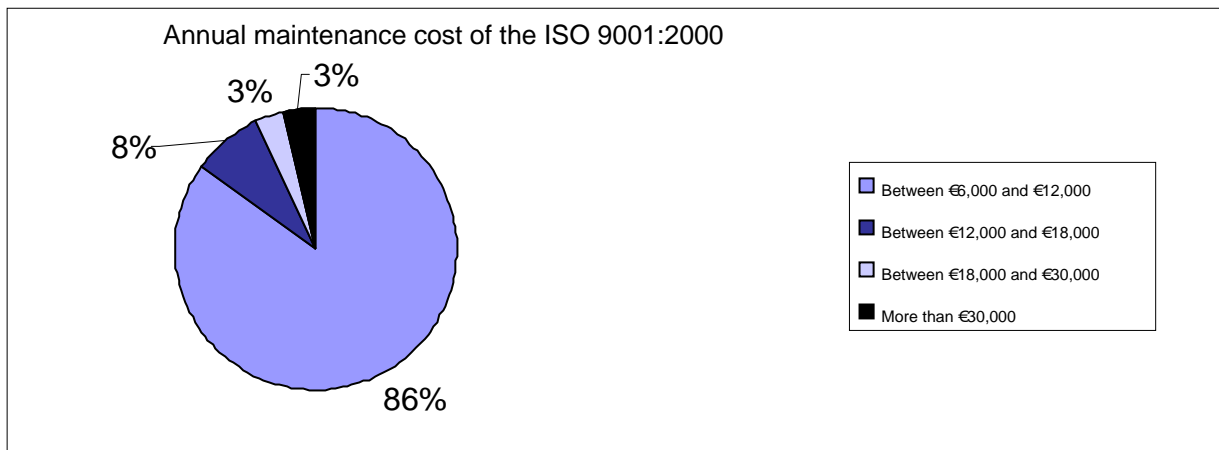


Figure 6: Annual maintenance cost of the ISO 9001:2000 standard.

1.3 Quality management system audits

Audit system

Given that the notion of a standard management system is based on the principle of designing a system from the corresponding standard, the system audit as per the criteria laid down in the standard is essential for their correct operation. Besides being an irreplaceable element of any standard management system, the audit is another system in itself which comprises a series of planning, implementation and information processes. These processes use human resources and information to assess and identify opportunities for improvement and to enable integration of standards.

The aim of the part of the survey related to the audits is to gain a better understanding of how they are implemented by Catalan companies, both when only one standard is audited (e.g. the ISO 9001) and in the case of audits performed on multiple standard systems (e.g. ISO 9001, ISO 14001 and others, where applicable).

As with the standard management systems, the audit systems can also be developed in accordance with specific models. Consideration must be given to the fact that the audit guidelines are generally published immediately after the creation of the respective standards as support for the establishment of management systems in companies (Karapetrovic and Willborn, 1998C; Karapetrovic, 2002B). Therefore, for example, until a few years ago documents such as the ISO 10011, ANSI Q1 and CSA Q395 covered the quality audit systems, whereas the ISO 14010, 14011 and 14012 did the same for the environmental management audits. However, the ISO (International Standards Organisation) developed a new standard in 2002 (the ISO 19011 standard) to be used as a guide for audits on both quality and environmental management systems. At present, this standard is under review and a new version is soon to be published.

The use of guides for carrying out the audit has been analysed in this work, as shown in Figure 7. While the ISO 19011 standard seems to be the most commonly used for external audits, in the case of internal audits, the companies themselves create their own procedures. For example, the ISO 19011 was used by 34% and 30% of companies in the case of internal and external audits, respectively, whereas the percentages for other guides stand at 39% and 32%. As might be expected, there is a large number of organisations that are unaware of the existence of these guides for external audits (24%), more than double the figure in the case of internal audits (11%).

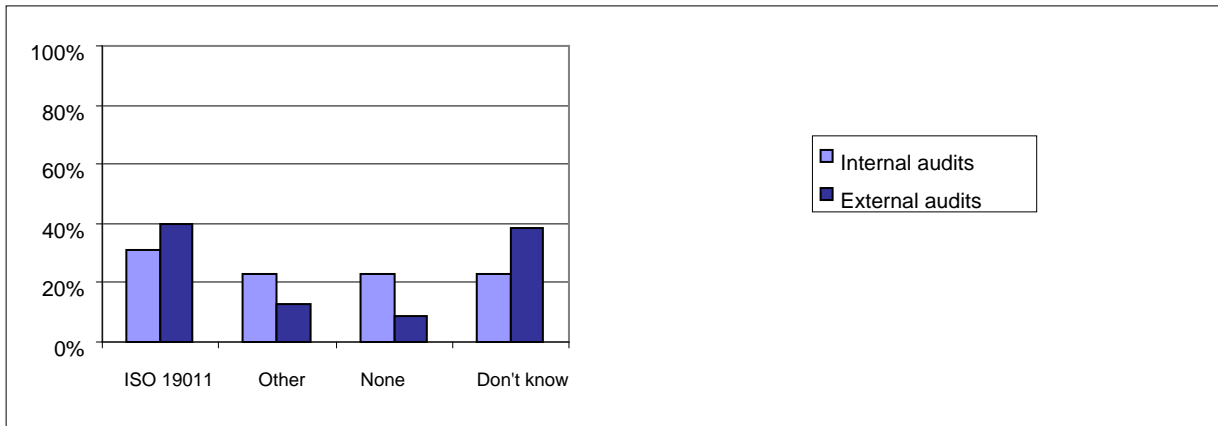


Figure 7: Guides used in the audit

A fundamental characteristic of an audit system is the link between the implementation of individual audits. In other words, it is useful to analyse the frequency with which both the internal and external audits are carried out. In doing so, intervening factors should be taken into account, which include planning, the mandatory audit periods and the need for increasing the frequency in specific areas or departments. Although many proposals have been made to this regard, such as the suggestion of considerably increasing the frequency of audits to improve their effectiveness and the competitiveness of companies, the best option is still not clear, other than the implementation of the mandatory audits.

Figure 8 shows the answers obtained with regard to this matter. It shows that most Catalan companies perform audits every 6 or 12 months. What might be anticipated is that the internal audits are carried out more frequently. Approximately one third of the companies answered that the time between audits is less than six months, whereas another third of the companies have external audits every 1 to 3 years.

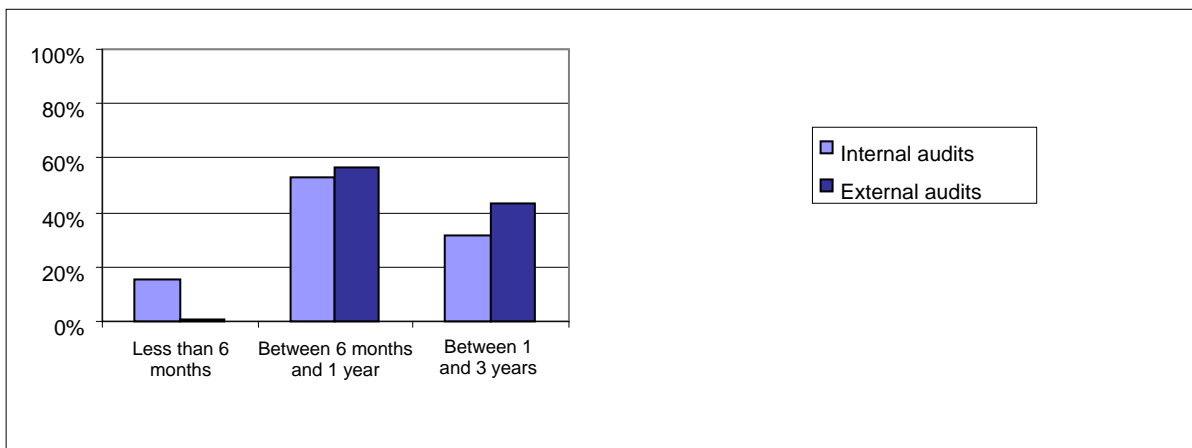


Figure 8: Audit frequency

The implementation of an audit system comprising a number of interconnected individual audits can also be characterised by the audit procedure used. In other words, a formal

procedure, which is when the auditor strictly follows the structure of the standard and, therefore, audits one requirement or criterion after another, which can be highly efficient from the auditor's point of view but very ineffective and even counterproductive for the companies, especially if they have not understood the relationship between the standard's various criteria. In addition, if we continue to focus on the process followed by the auditor, further working method is that of the "process focus", as introduced in the ISO 9001:2000 standard. It is important to ascertain which of these procedures is the most used in Catalan companies, since the standards do not specify how they are to be carried out.

Of the survey made, the results obtained in this section (Figure 9) are of particular interest. In the case analysed, three quarters (76%) of those taking part in the study perform internal "process-by-process" audits; in other words, the quality management system focuses on the organisation's product flow. Thus, only one quarter (24%) carry out this activity "requirement-by-requirement". Whatever the case, the situation is completely different in the case of external audits, in which the results are very close to 50% for each method. Exactly 52% of the external auditors, most of which are probably certification bodies, monitor an organisation's business process flow, whereas 48% still use the detailed analysis of each specific requirement laid down in the standard. Owing to the various reasons that may be encountered, such as awareness of requirements, as well as the natural importance the audit system places on internal audits, this result is perhaps not so surprising as might be imagined at first, especially if we take into account other answers obtained in the same survey.

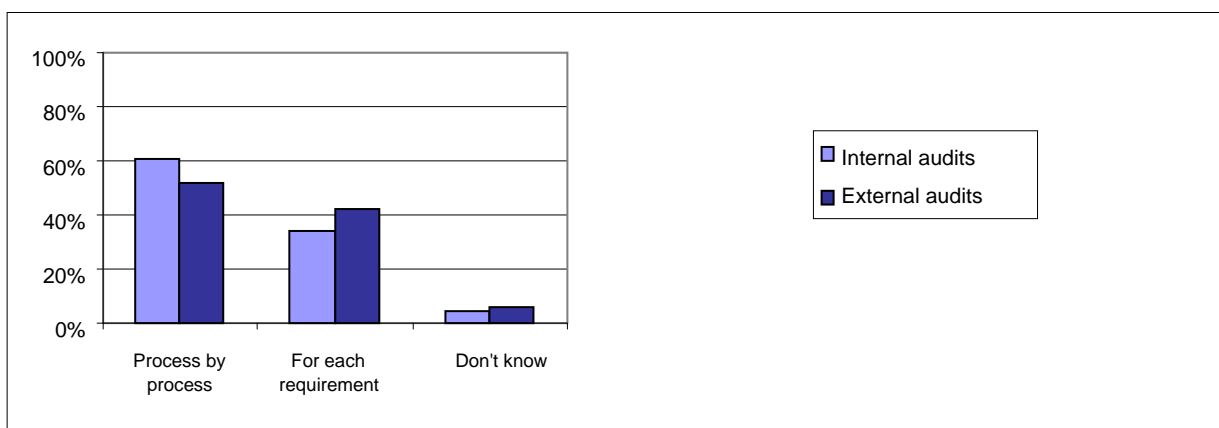


Figure 9: Audit procedure

Audit results

The main aim of the standard audit system is to assess how a certain system adapts to the standard. An audit needs to examine at least the compliance of the management system with the corresponding standard criteria. Since the existing criteria in a standard management system are "binary" (compliant/non-compliant), an audit may be limited to identifying the existence of non-conformities, but it may also reveal opportunities for improving the effectiveness and efficiency of the management system. Of course, a good audit must fulfil both objectives and, therefore, would have to be developed on sound bases and in accordance with a methodology that makes it possible to assess all management systems, regardless of whether it is audited based on an exclusive set of minimum criteria or on other, broader criteria.

Figure 10 shows the results obtained in audits. It is evident that companies' requests for more useful audits, which also help bring about improvements that go beyond compliance with the minimum requirements, have had their effect. Specifically, 79% of companies recognise that they have obtained suggestions for improvement, whereas 21% only recognise having received the non-conformities report from the internal auditor. This difference is even greater in the case of external audits, for which the auditors limit their work to reporting the non-conformities in only 10% of cases.

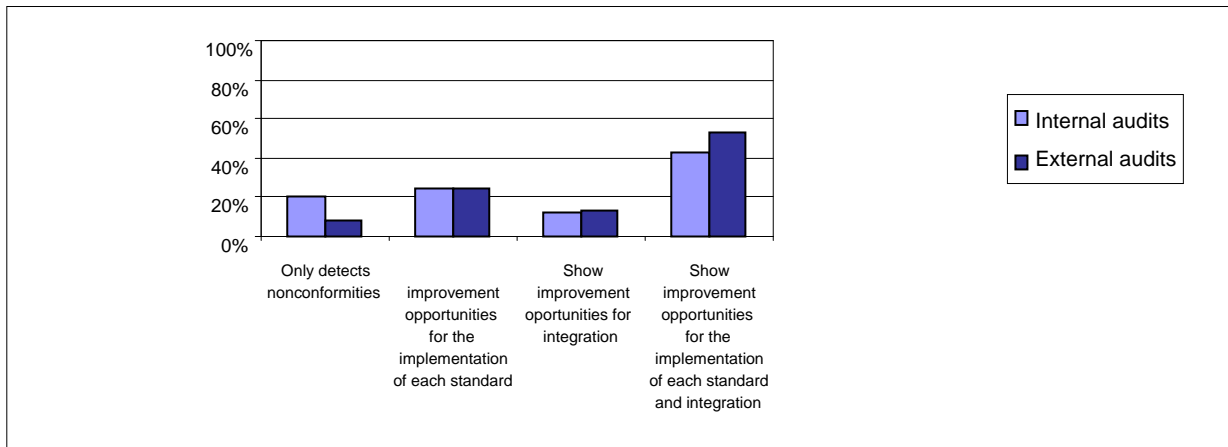


Figure 10: Results obtained in the audits

1.4 Benefits from the implementation of the ISO 9001:2000

Putting our personal point of view to one side, it is very clear that the studies in the literature on a world scale confirm that there are major benefits to be derived from the implementation of the ISO 9001. Even the surprisingly high number of companies that have been "pressured" by their customers into obtaining the certificate stand to benefit from it. Indeed, certain authors recognise customer demand as the main reason for obtaining the ISO 9000 certificate, whereas others include it on the list of the most important reasons.

However, we must ask ourselves about the nature of benefits it has provided. On a world scale, there are several works that seek to answer this question. In many cases, the results obtained are quite different and, at times, contradictory. One of the reasons we found for explaining these differences are the different approaches adopted in the works on the subject. For example, whereas some authors work by taking into account the internal and external benefits, others prefer to work with what they call benefits related to internal operations, others with benefits related to customer and supplier relations, whilst others prefer to differentiate strategic benefits from operative benefits. Whatever the case, another of the main reasons for these differences is the subjective nature of the surveys on which many studies are based, since most of them include surveys or interviews with the companies' managing directors or quality assurance managers. However, what are the alternatives?

There are also a reasonably large number of studies that work with aggregated data, such as the analysis of databases with economic/financial information about the companies. With regard to the ISO 9001 standard, for example, there are many widely distributed studies that seek to demonstrate the relationship between the application of the standard and companies' economic efficiency. Some studies show that this relationship is positive and suggest that, after having obtained the certificate, companies' efficiency increases since they have better economic/financial indicators. However, it is also possible to encounter studies that suggest the opposite. In any case, from our point of view, it is not easy to ascertain the exact cause and effect. In other words, it is not easy to determine whether the companies that obtain the certificate are the companies that have the best indicators or whether the companies that have the best indicators are the companies that obtain the certificate.

Of course, discussing the benefits of the ISO 9000 certificate is not the purpose of this section, since any information obtained will probably not be vastly different to that in the studies that have been carried out all over the world. Indeed, most of the benefits, obstacles and other issues related to the implementation of the ISO 9001 do not differ too greatly from

one culture or country to another. Whatever the case, in order to analyse the subsequent evolution of these benefits, it is useful to show some of the results obtained from the survey carried out in Catalonia. The results are shown in Figure 11, which shows not only the most significant benefits of the implementation of the ISO 9001 standard in Catalan companies, but also the percentage of companies that have noticed a positive, negative or indifferent influence with regard to each benefit. In accordance with the classification devised by Vloeberghs and Bellens (1996), these benefits can be classified into four large groups: financial results, benefits the customers, benefits for workers and operative results.

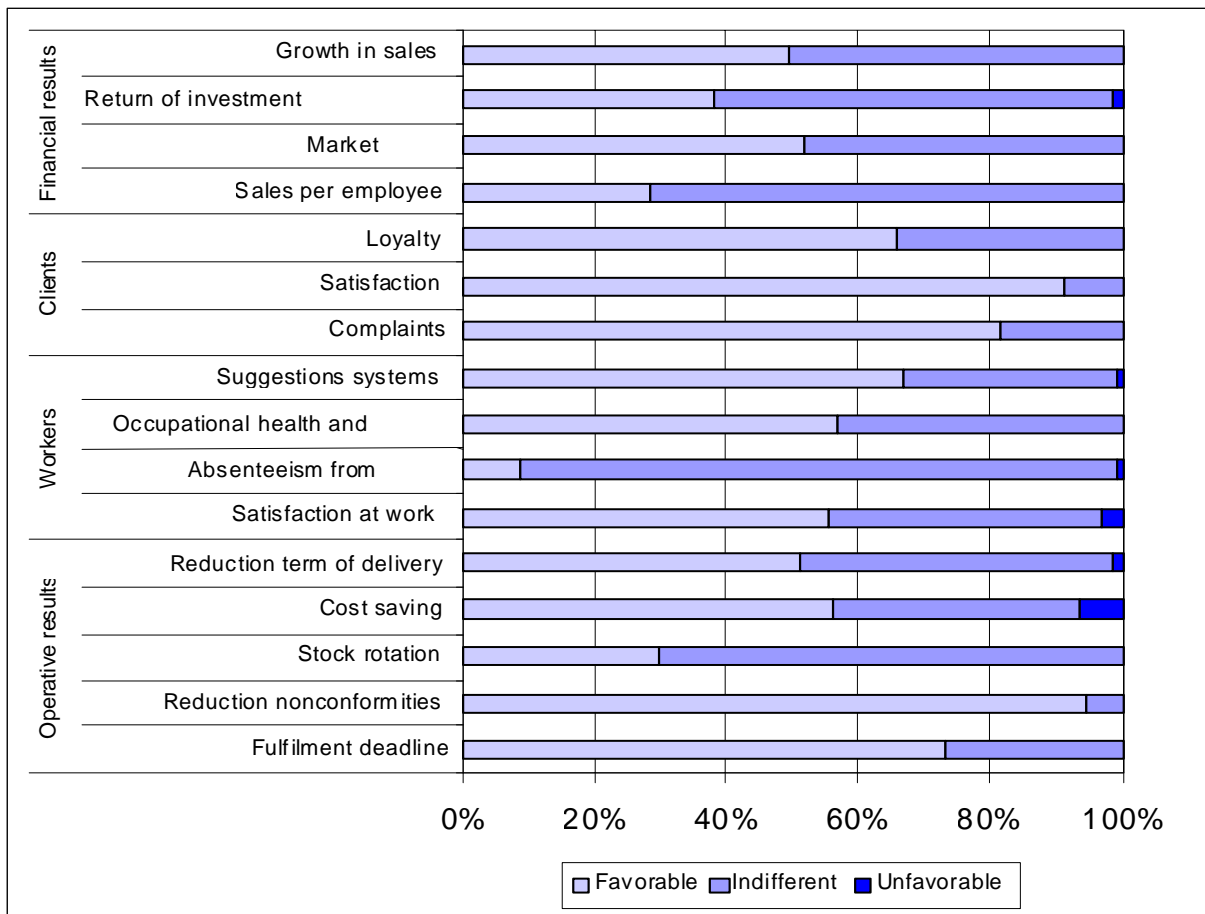


Figure 11: Benefits from the implementation of the ISO 9001:2000

Figure 11 shows that the ISO 9001 has a positive effect on almost all the benefits studied for most Catalan companies. However, in some cases, such as absenteeism from work, there are a significant number of companies that fail to see any effect of the ISO 9001 on this particular point. The number of companies that admit to having experienced any negative effects is almost negligible. Indeed, only in the case of the reduction of logistics costs did more than 5% of the sample provide negative feedback.

Instead of analysing the benefits one by one, the following is an analysis of only the most relevant results:

- In most cases, the implementation of the ISO 9001 standard has a positive effect on the company.
- The most significant benefits include the reduction of non-conformities, the reduction of complaints and the increase in customer satisfaction.
- The implementation of the standard has clearly given rise to improved customer relations, as shown in customer satisfaction, a reduction in customer complaints and improved customer loyalty.
- Only a very small number of companies, approximately 2%, consider that they have been negatively affected in some way, basically economically, by the implementation of the standard.
- With regard to employees, more than 50% indicate that the implementation of the ISO 9001 has improved the suggestions system and approximately half highlight their own satisfaction with the work carried out.
- Many companies have noticed no effect from the ISO 9001 in financial terms, although some (between 15% and 40%, depending on the indicator) have noticed a positive impact. Accordingly, for example, for 38% of those who took part in the survey, the ISO 9001 has improved their market share considerably. The number of companies that consider there has been a negative impact on the four financial indicators is insignificant.
- From an operative point of view, the direct benefits of the implementation of the ISO 9001 can be summarised as follows: a reduction of non-conformities and delivery terms.

In addition, some of the negative issues that are worthy of particular mention are as follows:

- Although very small, there is still a proportion of companies that assesses the implementation of the ISO 9001 standard negatively, especially with regard to costs.
- The ISO 9001 does not affect absenteeism from work.
- The ISO 9001 does not affect sales per employee.
- A total 7% of the companies consider that they have been negatively affected by the implementation of the standard since their costs have increased more than the revenue they have obtained from the investment.

1.5 The impact of the ISO 9001:2000 in Catalonia in recent years

Benefits

In order to assess the changes in companies' perception of the benefits of implementing the ISO 9001, a comparison has been made between the results obtained in this survey and similar (but not identical) surveys carried out in 1998 and 2002. It is important to note that in order to obtain more reliable results and as far as possible to avoid routine responses to questions, the structure and content of the surveys performed in 2002 and 2006 underwent changes with regard to the original of 1998. The comparison between the importance of the benefits detected in the three surveys is shown in Figure 12.

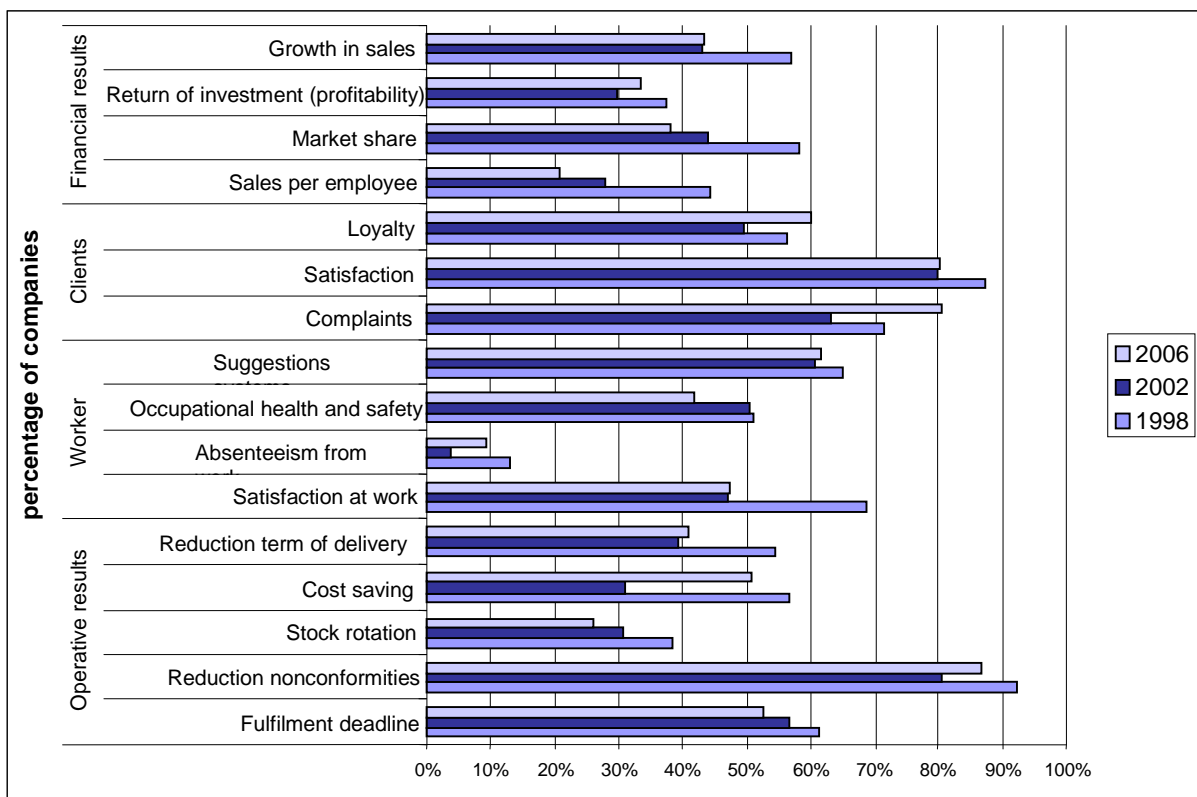


Figure 12: Benefits from the implementation of the ISO 9001:2000 (1998-2002-2006)

From Figure 12 above, two main issues clearly come to light. First of all, the "shape" of the benefits perceived is almost identical in all three cases. For example, in 1998, 2002 and 2006, the reduction in the number of non-conformities and the increase in customer satisfaction are the two benefits which have clearly been seen as the most important, whereas absenteeism from work is the issue least affected by the implementation of the ISO 9001. Secondly, in the 1998 survey, the number of companies with a positive perception of benefits is, in almost all the issues under analysis, higher in comparison with the surveys carried out in the other years. In particular, and comparing, for example, only the first two surveys, the statistical difference between the two samples was analysed by a binomial test

and, with a maximum error margin of 5%, it can be said that only four of the 16 factors are not statistically significant: repetition of purchases, suggestions system, work satisfaction and fulfilment of delivery term. The other 12 factors were statistically significant and it can be said that the benefits obtained by companies in 1998 were slightly higher than those perceived in 2002. Very similar results are obtained by comparing the figures from the last survey with those from the first.

The same results were obtained when the different factors in the four categories mentioned previously were added together, as shown in the Figure 12: operative, financial, workers and customers. The four show a significant reduction, albeit not very high, of the benefits obtained. In other words, although companies continue to obtain many benefits from the certificate, it is clear that they are not valued as highly as before. Is it possible to explain this "temporary erosion" of the benefits?

One possible cause could be that the benefits resulting from the implementation of the ISO 9001 have actually fallen over time. A more routine implementation of the systems by the consultants, as well as a more standardised audit process, could have led to a certain "relaxation" in the implementation of the system, which would probably reduce the "quality" of the management system. In addition, the changes in the profile of the organisations and/or their motivation for attaining the certificate in the last eight years may also have contributed to this change in perception. For example, bearing in mind that the number of small companies registering for the certificate is on the increase, even though many of them may have applied for the certificate in the search for internal and operative benefits, many others have done so only as a result of pressure from their customers or in the belief that it would open up the door to new markets. In this case, it will not be easy for these organisations to see the financial or operative effects or the effects on their workers as a result of the application of the standard in the short term. Furthermore, the ISO 9001 standard provides fewer and fewer competitive advantages over other companies, since the number of companies certified as complying with the standard is on the increase in all sectors. Therefore, if a certified company had any advantage over an uncertified company, this is no longer the case, since most of its competitors will also be certified. As a result, since this standard only requires compliance with a set of minimum requirements that a quality assurance management system must have, all companies must at least comply with these requirements and, therefore, no type of competitive advantage can be found. Furthermore, the benefits resulting from improved customer relations, such as the increase in the market share or customer satisfaction, can no longer be achieved only through the ISO 9001 certificate.

Another possible cause of the reduction in benefits may be the fact that the companies that took the survey revealed a reduction in the perception of the abovementioned benefits, which is logical: it is normal for organisations to feel satisfied with the successful completion of a project just after a certificate has been awarded and they perceive the resulting benefits as much higher than they actually are. In other words, they are much more optimistic than they should be. After a certain period of time, the organisations adjust their perceptions to the actual situation.

Indeed, the results may initially seem interesting, since we would not necessarily be expecting this reduction in most of the benefits analysed. Thus, in the study carried out by Sun (1999) on total quality management practices (TQM), the author observes that the longer the companies have been applying the said practices, the better the results. In other words, he suggests the existence of a "learning curve", which could be parallel in the case of the companies that implement the ISO 9001.

It is clear that the ISO 9001 standard has provided a great many benefits to Catalan companies, as the studies confirm, in the same way that it has provided benefits to companies all over the world. And although we have detected a certain reduction in the perception of these benefits, very few tools, techniques or management models can report such positive results.

Implementation costs

The variation in the perception of the benefits provided by the ISO 9001 cannot be analysed without considering the related costs. The reason for this is that as it has been seen that benefits have fallen very slightly, it is only to be expected that the implementation and maintenance costs of the quality management system also fall.

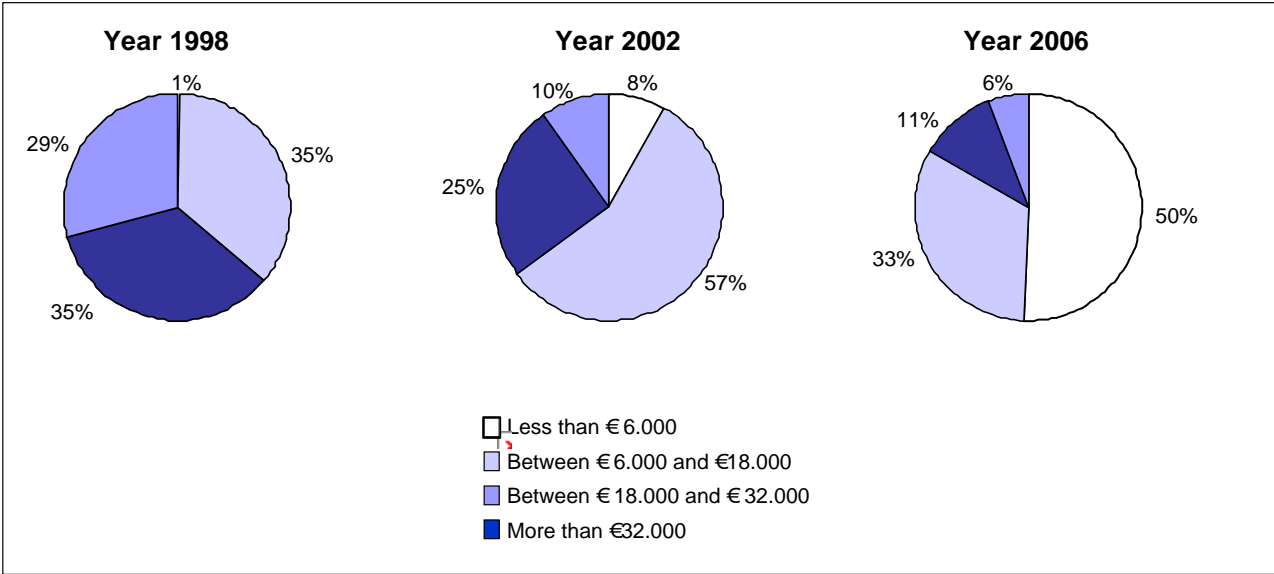


Figure 13: Cost of implementing the ISO 9001:2000 standard (1998-2002-2006)

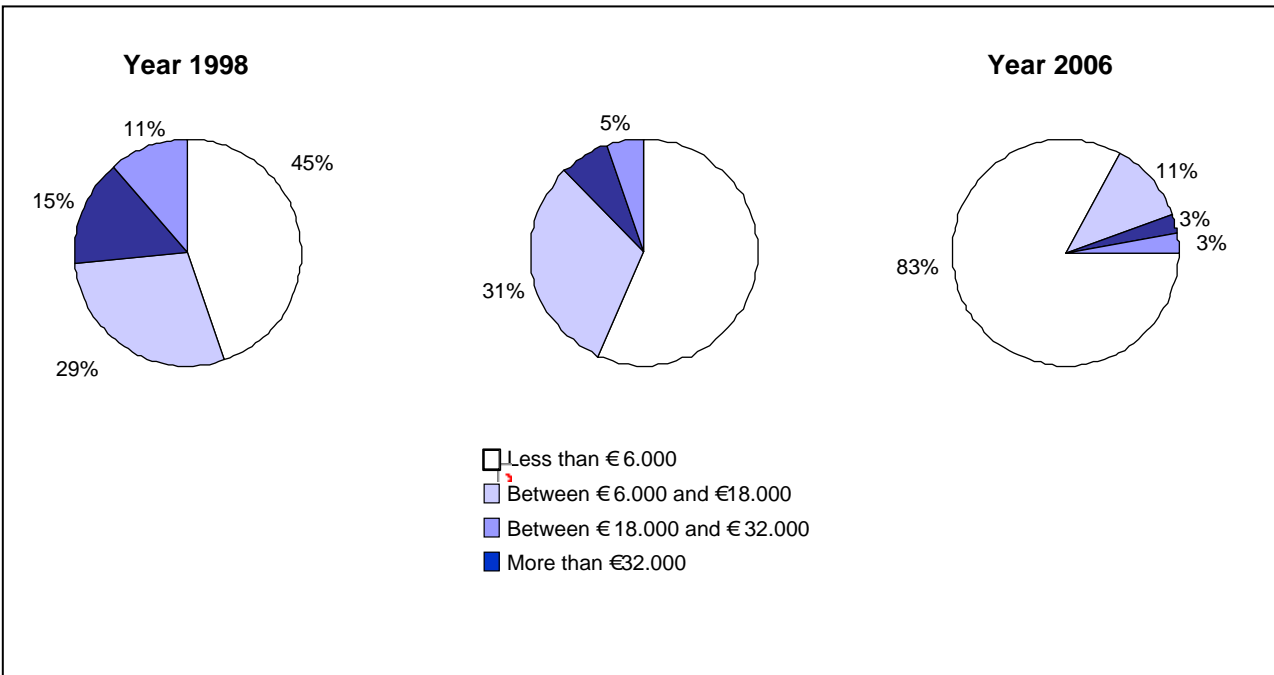


Figure 14: Annual maintenance cost of the ISO 9001:2000 standard (1998-2002-2006)

Figures 13 and 14 show that maintenance costs have fallen considerably in Catalonia over this eight-year period. Evidently, this reduction would be even greater if, instead of considering the nominal cost of implementation and maintenance, we were to consider the real cost, taking into account the evolution of the cost of living in Catalonia over this period. In any case, these results must be analysed very carefully, since they may depend on many

factors, including the size of organisations. Therefore, Figures 15 and 16 show the implementation and maintenance costs of an ISO 9001-compliant quality system, respectively, depending on the size of the company.

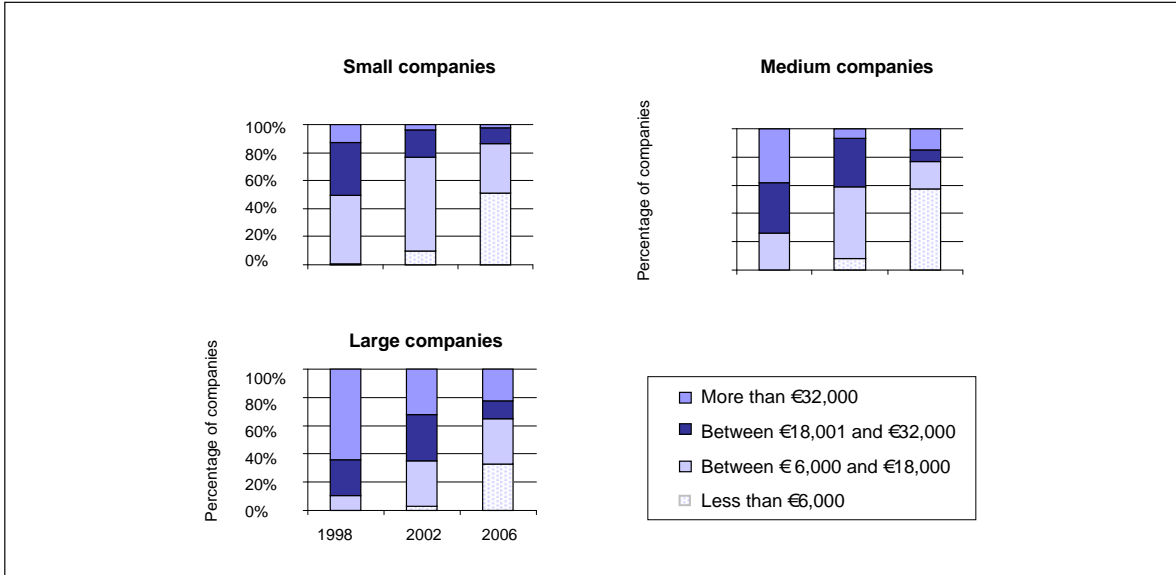


Figure 15: Cost of implementing the ISO 9001:2000 standard according to the size of the company (1998-2002-2006)



Figure 16: Annual maintenance cost of the ISO 9001:2000 standard according to the size of the company (1998-2002-2006)

Based on these figures, it is easy to see that both the implementation and maintenance costs have clearly fallen in recent years. For example, a comparison of the figures in the 1988 survey with those in the 2002 one shows that implementation costs have fallen by an average of 55% and maintenance costs have fallen by approximately 26%. Furthermore, we can conclude that these costs depend less and less on the size of companies.

It is also possible to analyse the average cost of implementing the ISO 9001 and the maintenance cost per employee. A comparative analysis of the three surveys (Figures 17 and 18) also shows this considerable reduction in the costs involved.

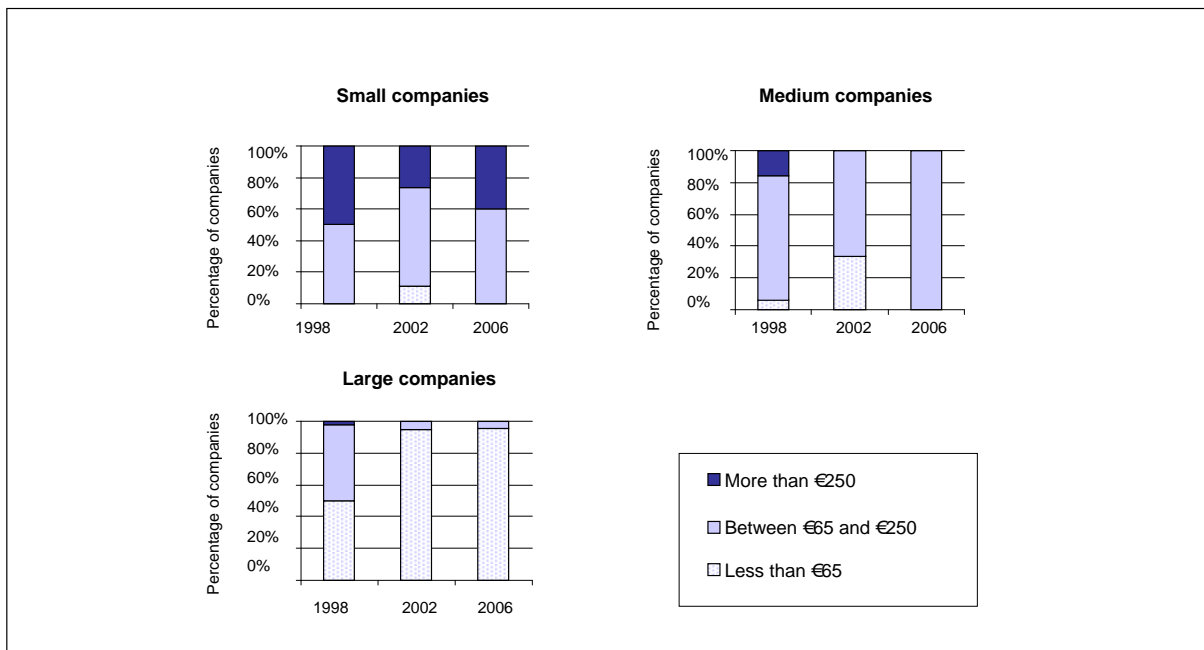


Figure 17: Cost of implementing the ISO 9001:2000 standard per employee (1998-2002-2006)

Indeed, McAdam and McKeown (1999) stated that the cost per employee of the implementation and maintenance of a quality management system will be higher in a small company than in a large company due to the fixed costs, but they did not demonstrate this fact. The results obtained comply with this idea and also suggest that, over the years, these costs have fallen considerably.

There are many possible causes for this reduction. McAdam and McKeown (1999) also state that these costs will vary in accordance with the efficiency of the systems already in place and the skills of the personnel involved. The existence of more efficient quality systems coupled with the wider experience of consultants, certification bodies, customers and personal associations has also possibly influenced the reduction in costs. In any case, the main cause has probably been the certification market itself. On the one hand, there are more certification bodies and, on the other, there are fewer companies that require the certificate. Indeed, as companies perceive fewer benefits from having the certificate,

although, as detected, this reduction is only very slight, it would appear to be logical for implementation costs to have fallen.

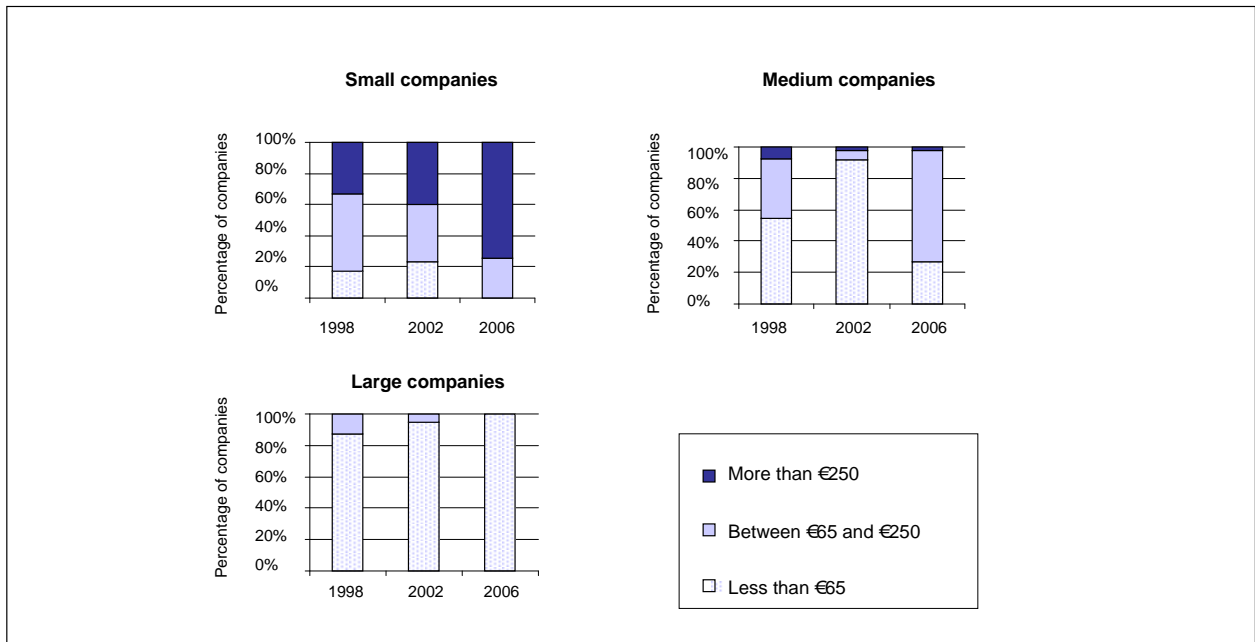


Figure 18: Annual maintenance cost of the ISO 9001:2000 per employee (1998-2002-2006)

Average implementation time

Finally, the time required to implement the ISO 9001 standard can also be analysed. As shown in Figure 19, there is a substantial reduction in this time in all the types of company analysed. This is probably due to the fact that the resources available for the companies have increased considerably in both quantity and quality over the last eight years. The establishment of sectoral consortiums in small companies aimed at improving the implementation processes, the publication of guidelines by the local government and the greater experience of consultants may be some of the factors that reflect this fact. Large companies have also definitely benefited from the increase in the tools available for implementation, as well as from the better training of their employees in matters related to quality management.

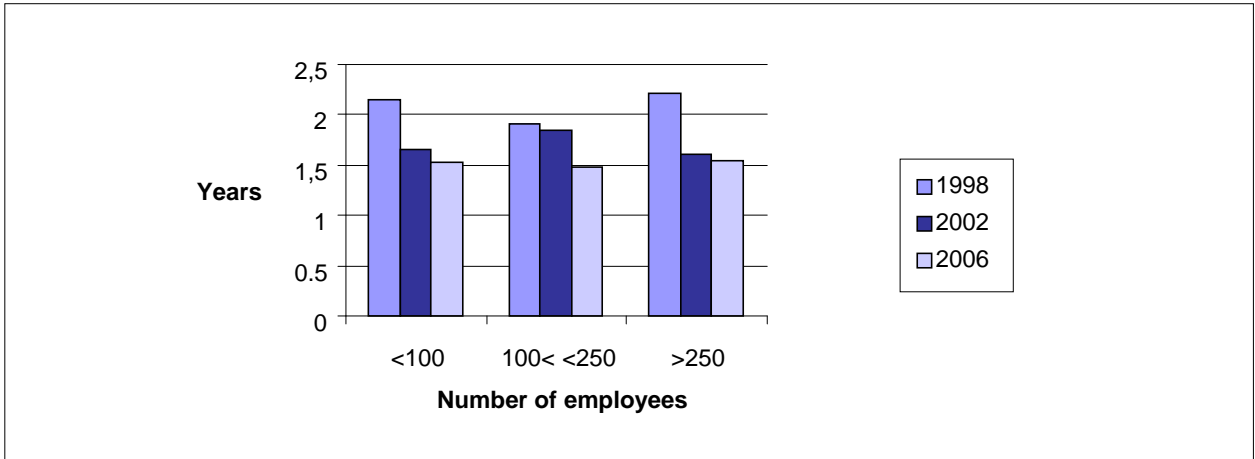


Figure 19: Average implementation time of the ISO 9001:2000 (1998-2002-2006)

2. STUDY: COMPANIES CERTIFIED IN CATALONIA AS COMPLIANT WITH THE ISO 9001:2000 AND ISO 14001:2004 STANDARDS

This second section includes the data that describes the analysis carried out in Catalan companies that are certified as compliant with the ISO 9001:2000 standard for quality management and also with the ISO 14001:2004 standard for the environmental management of companies. The aim is to assess the impact of these systems on quality management in companies, most of which had begun the process towards improving quality and then decided to continue implementing additional standardised management systems. We believe that this group of companies is able to provide more information about the future of quality in Catalonia.

2.1 Profile of the study

As stated in the objectives of this study, in order to make a reliable assessment of the impact of the ISO 9000 standard on Catalan companies, another questionnaire was drawn up at the same time and sent to the Catalan companies that had implemented at least the ISO 9001:2000 and ISO 14001:2004 standards. The aim was to assess the companies that had continued the certification process, very possibly because they felt they had benefited from it.

The main aim of the survey, which was aimed at the persons responsible for quality management systems and/or environmental management systems, was to analyse not only the impact of the quality management standard, but also how this standard had been integrated with others in Catalan companies. The questionnaire was answered by 176 companies, which translates to a 33% response rate. The general profile of the study is shown in Table 2.

Date on which the survey was sent	2006
Population	Approximately 1190 companies certified as both compliant with the ISO 9001:2000 and ISO 14001:2000 standards in Catalonia in 2006.
Study sample	538 companies
Replies obtained	176 companies
Reply percentage	33%
Maximum error (p=q=0.5)	6 %

Table 2: Study profile: companies with the ISO 9001:2000 and ISO 14001:2004 standards

The main characteristics of the companies that took part in this second part of the study described below.

- Number of employees: It is interesting to note that Figure 20 shows the number of large companies in this sample is higher than in the group of companies with only one quality certificate, as would initially be expected. Although most companies in this group are still small, with fewer than 100 workers (56%), this percentage is clearly lower than the figure obtained in the previous sample. There is also a significant number of companies that employ between 101 and 500 workers (33%) in this survey.

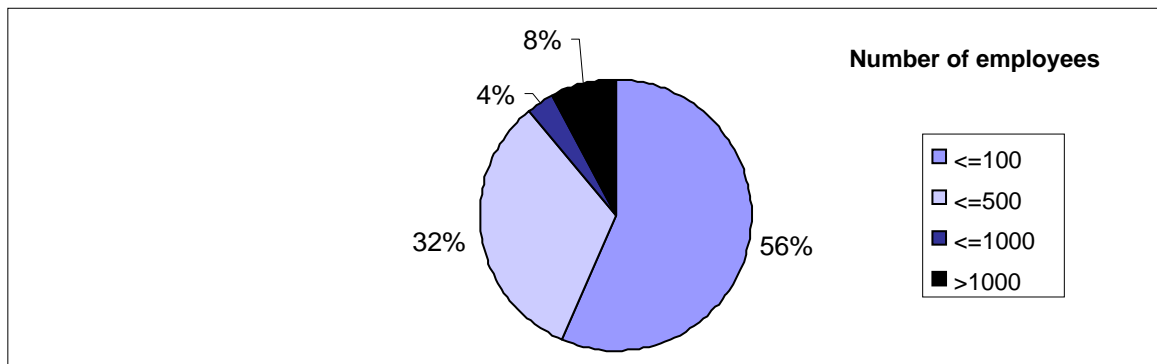


Figure 20: Number of employees at the companies certified as compliant with the ISO 9001:2000 and ISO 14001:2004 standards.

- Economic sector: In this group of companies, as shown in Figure 21, certified companies are involved in very similar economic sectors to those in the previous group of companies. It can therefore be seen that the implementation of two or more standards does not seem to depend so much on the sector in which the organisation is working as on the number of workers; in other words, on the size of the company and, in short, on its capacity for implementing new standard management systems.

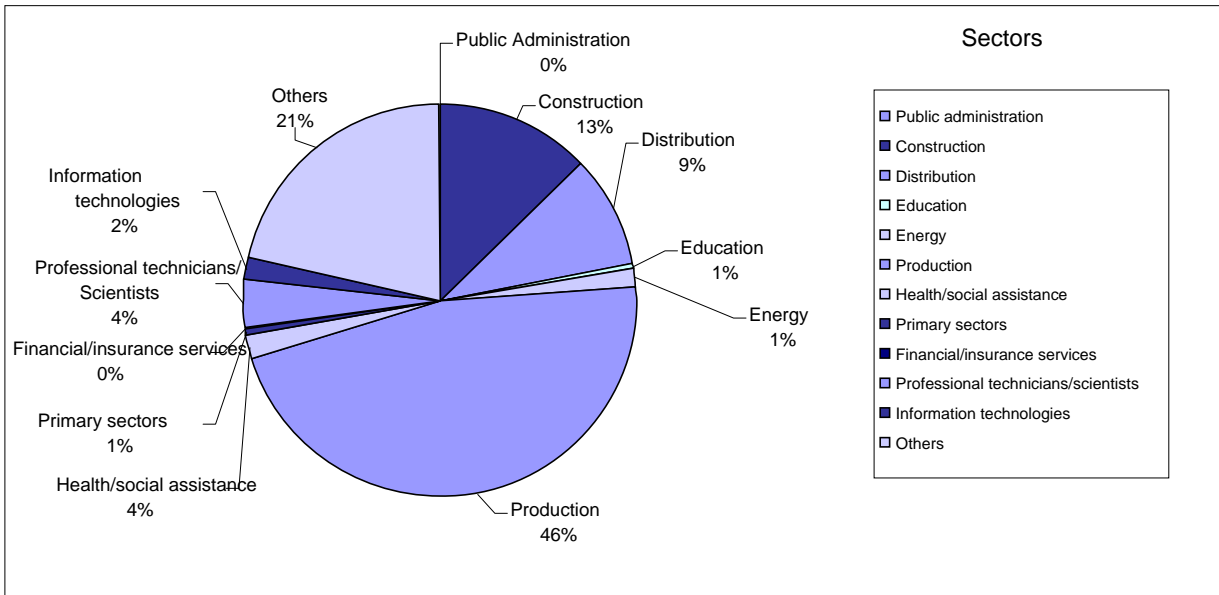


Figure 21: Economic sectors of the companies certified as compliant with the ISO 9001:2000 and ISO 14001:2004 standards.

- External customers: Figure 22 shows that, in the study carried out, 56% of the companies that have implemented at least two standards have another company as their main customer. These data are very similar to those obtained for the previous group, which could be interpreted as there not being much difference between the two groups of companies, except as far as the number of workers is concerned. In this particular case, only 29% of the organisations have end consumers as their main client.

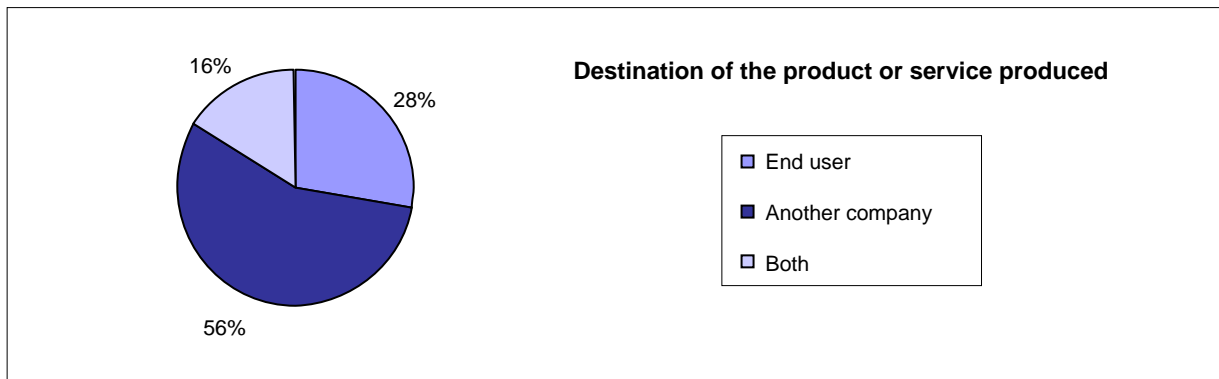


Figure 22: Destination of goods produced by the companies certified as compliant with the ISO 9001:2000 and ISO 14001:2004 standards.

2.2 Implementation of the ISO 9001:2000 standard

Among other issues, Sections 1.2 and 1.4 of the study analysed the costs and benefits associated with implementing the ISO 9001:2000 standard. These issues were analysed on the basis of the answers received from companies that were certified as compliant with the said standard only. In this section, however, a much shorter analysis shall be made using the information from the companies that had implemented at least two standards: the ISO 9001:2000 and the ISO 14001:2004. A priori, this study was performed because it was thought that there may be significant differences between the two groups. However, it must be highlighted that the work is merely comparative, since a detailed analysis has already been presented.

First of all, the benefits of the ISO 9001 standard are also highly significant in this group of companies, as shown in Figure 23. Indeed, the number of companies not satisfied with the standards is, as might be expected, even smaller than that detected for companies certified as compliant only with the ISO 9001 standard, which is insignificant in practical terms. We say "as might be expected" because if we consider that most of the companies that implement the ISO 14001 do so because they have already implemented the ISO 9001, they would not have done so if they had not been satisfied with the first standard. The only possible reason to explain dissatisfaction would be that the companies were "forced" to obtain the certificate by their customers.

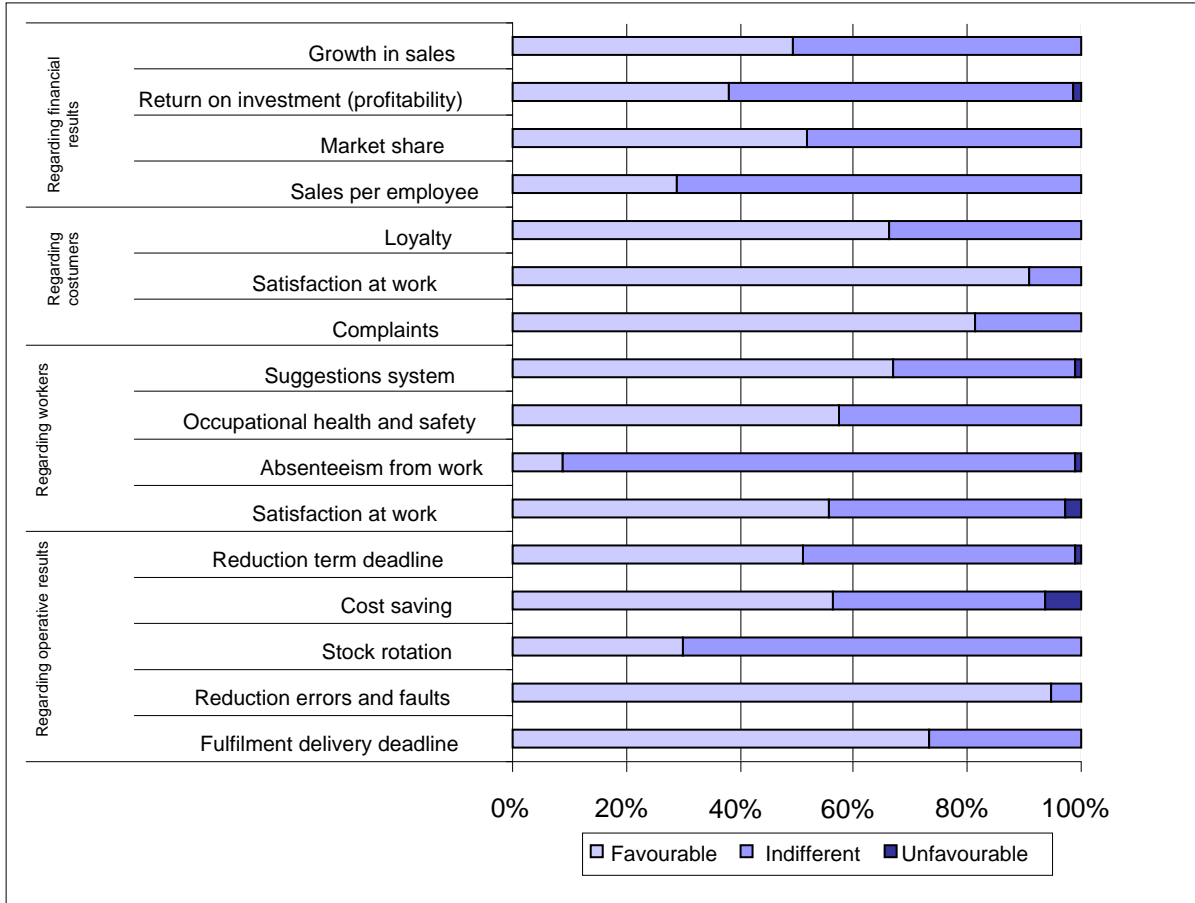
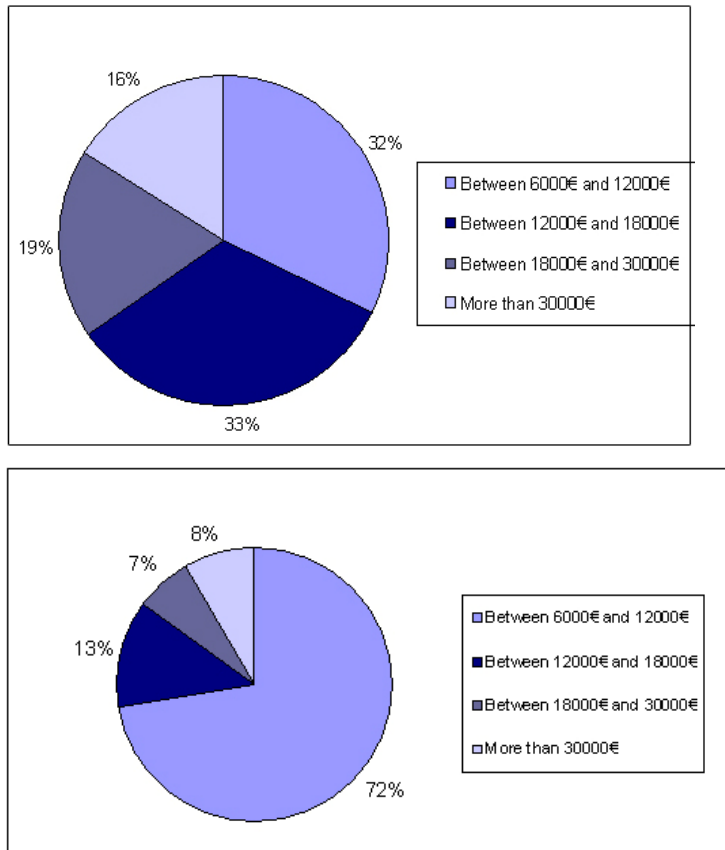


Figure 23: Benefits from the implementation of the ISO 9001:2000

With regard to the companies that consider that they have benefited from the standard, the percentages are higher in all cases by an average of 5% than those corresponding to the other sample of companies. In this case, we could put forward an argument similar to the above. Namely, companies are highly satisfied with the implementation of the standard, especially those that have implemented more than one standard. We are unable to ascertain the cause and effect, but we are able to determine they are more satisfied. In other words, if the companies that are most satisfied with the ISO 9001 are those that implement the ISO 14001, or vice versa, the companies that implement both standards see more benefits in the ISO 9001 due to the existing synergies. In any case, we should not be concerned if we take into account that the benefits are more than evident and also sustainable over time, as shown in Section 1.5.

As far as the implementation costs of the ISO 9001 standard are concerned, an analysis similar to the above has been made. Figures 24 and 25 show the implementation costs and annual maintenance costs for this group of companies that have implemented two standards.



Figures 24 and 25: Annual implementation and maintenance costs of the ISO 9001:2000 standard.

As far as costs are concerned, both the implementation costs and the annual maintenance costs of the ISO 9001 are much lower for this group of companies than for the companies that have implemented only one new standard. For example, with regard to the implementation costs, more than half the companies stated that they had incurred costs of between 6,000 and 12,000, whereas this was only true in 31% of the cases of companies with only one certificate. The same is true of the maintenance costs as 86% of these companies consider that they are less than 12,000 per annum, whereas this percentage was 74% for the first group.

In our opinion, this fall in cost is, to a certain extent, logical. It should be remembered that a high percentage (around 85%) in this second group of companies have integrated the management systems. Therefore, the system maintenance costs should be considerably lower, since, for example, the audits could be integrated and the same person could be responsible for the two management systems.

Undoubtedly, by running several standard management systems the benefits are increased and all associated costs are reduced.

2.3 Management systems implemented by companies

Scope of the standardisation

Current standard management systems cover a wide spectrum of areas in organisations with a view to offering their various internal and external stakeholders a certain level of reliability. Karapetrovic and Willborn (1998A and B) and Karapetrovic (2002A) describe the factors that most influence the decision to implement a specific standard management system. These factors include the possibility of using internationally accepted models and the "usual" pressure from customers. This means, for example, that many energy companies are not certified as compliant with the ISO 9001 standard since their customers do not ask for it, whereas they are certified as compliant with the ISO 14001 standard. However, companies in the car industry generally have both standards, in addition to ISO/TS 16949 as an extension to the quality management system. The three most common standard systems are the quality management system (ISO 9001:2000), the environmental management system (ISO 14001:2004) and the occupational hazards prevention and security management system (OHSAS 18001:1999). However, as may be expected other more recently published standards, such as those related to technology management (e.g. the ISO 20000:2005 for the services sector and the ISO 27001:2005 for safety), or others that may be published in the future (e.g. the future ISO 26000 for corporate social responsibility management) will increasingly gain in importance.

The empirical research carried out in Catalonia in this study confirms these ideas. Of the companies certified as compliant with the ISO 9001 and ISO 14001 standards, 22% had also implemented the OHSAS 18001 standard, whereas the proportion of other more specific standards was much lower. For example, less than 2% of the companies stated that they had incorporated a model for corporate social responsibility management in accordance with the SA 8000 guide or the Spanish SGA 21 standard, and only 3% had implemented the Spanish standard for innovation, research and development management: UNE 166002. The implementation of specific sectoral standards, such as the ISO/TS 16949 standard for the car manufacturing sector, was observed in 6% of organisations and the EMAS regulation for environmental management in 13%.

Implementation sequence

Owing to the differences in organisations' application requirements, as well as the sequential development of new standards by the bodies entrusted to do so, it might be expected that the order of implementation of any of these standards would be different for the companies depending on their sector.

In many cases, the implementation sequence will follow the publication sequence, i.e. first the ISO 9001 standard and then the ISO 14001 standard. Thus, other functions in the company would be standardised consecutively, such as the occupational hazards prevention and safety management as per the OHSAS 18001 standard. In other cases, although a minority, the ISO 14001 may be implemented first followed by the ISO 9001. Furthermore, the variety of existing standards could make it possible to implement several standards that cover various functions in an organisation at the same time. This implementation method, especially if it has the support of good models and methods for integrating management systems, will very possibly come to the fore in the future.

Figure 26 shows the answers obtained in the survey regarding the implementation order of the standards in Catalan companies. Taking into account only the objective of each management system, i.e. without considering sectoral standards (e.g. ISO/TS16949) or standards resulting from others that perform a similar function (e.g. the EMAS regulation), most companies initially implement the ISO 9001, then the ISO 14001 and, finally, the OHSAS 18001. These results confirm exactly what we expected. It is also interesting to note the distribution of sequences with regard to the two standards that characterise this population: the ISO 9001 and the ISO 14001. The environmental and quality management systems were implemented at the same time by 11% of the participants, whereas only 3% implemented the environmental management system first. The remaining 86% began with the ISO 9001 and followed with the ISO 14001.

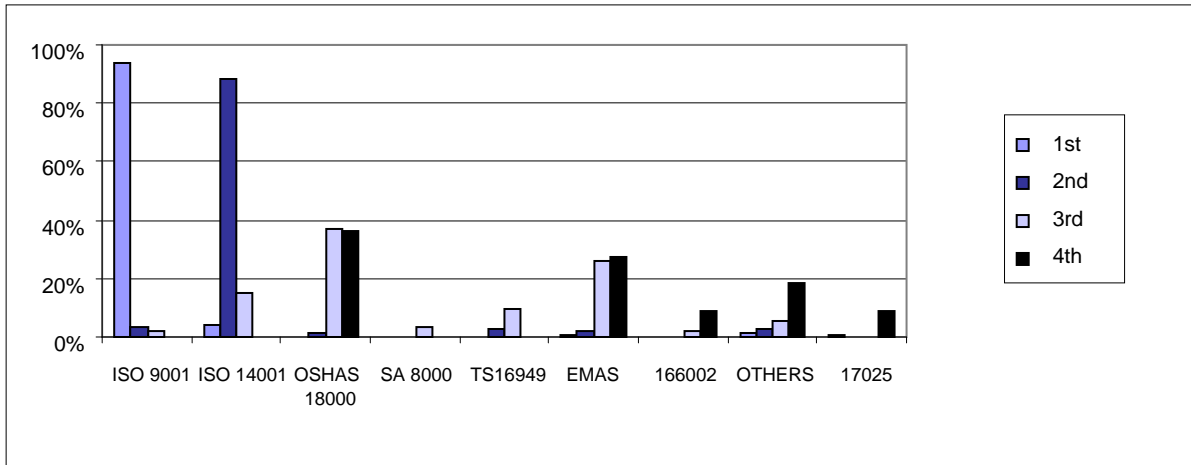


Figure 26: Implementation order of the different management standard systems

Time required for the implementation

The question of how much time is required by organisations to implement the different management standards is very interesting and it is also related to the efficiency in the use of resources and to the effectiveness in applying the standards. Whenever standards contain a high enough number of common characteristics, are of an identical "nature" and share fundamental concepts, an organisation that uses the standard management system will understand much better, if not completely, the fundamental principles, models and requirements of whatever new standard it wishes to implement. Furthermore, the new standards will require more time for their implementation, unlike their predecessors. In addition, as a result of existing synergies, if a company is implementing two or more standards, the time required for the implementation should be less than the sum of the time required if they were implemented sequentially.

The average implementation time for the first standard in Catalonia, based on the figures obtained from the survey, is one and half years, whereas the implementation of the second standard takes approximately 12 months, which suggests a reduction of half a year. The averages for the implementation of the third and fourth standard are the same: 11 months. Thus, the empirical results show a general reduction in the time required for implementing the additional standard management systems and they also confirm the final assumption: the average time for the simultaneous implementation of the ISO 9001 and the ISO 14001 is 13 months, which, compared with the sum of 33.5 months for the sequential implementation of the two standards, is much less. Figure 27 shows the results of the survey according to the implementation order of each standard. It is clear that the average implementation times for most standards in organisations are between six months and one year, which is very similar

to the results obtained for the companies that have only been certified as compliant with the ISO 9001.

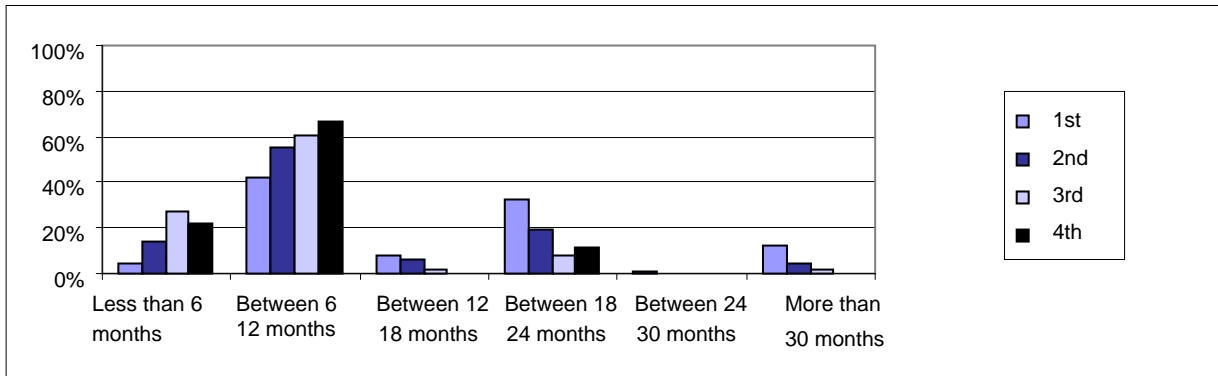


Figure 27: Time for implementing a standard by implementation order

Reasons for implementing a new standard

In terms of encouraging companies to implement new standard management systems, it makes sense to assume that all the issues detected for the implementation of the first standard will also apply to the second. Whatever the case, the increase in "customers" to be satisfied by the organisations, as well as the increase in the functions to be covered by the new standards possibly makes the above assumption not altogether correct.

Figure 28 shows a list of reasons, together with their importance, for implementing a certain standard. With a score of 4.25 out of 5, the most relevant factor for companies is the positive impact on their reputation and the improvement in their image. The second most relevant issue is related to improving companies' competitiveness, with a score of 3.92. These two are followed by reasons that could be classified as internal: improving efficiency and control (3.9) and reducing problems and accidents (3.85). These are followed by pressure from customers, with 3.65, and the existing synergies with other standard management systems (3.64). It seems that following along the same lines as the previous standards (3.31), improved market share (3.15) and government pressure (2.85) are not as important as the above.

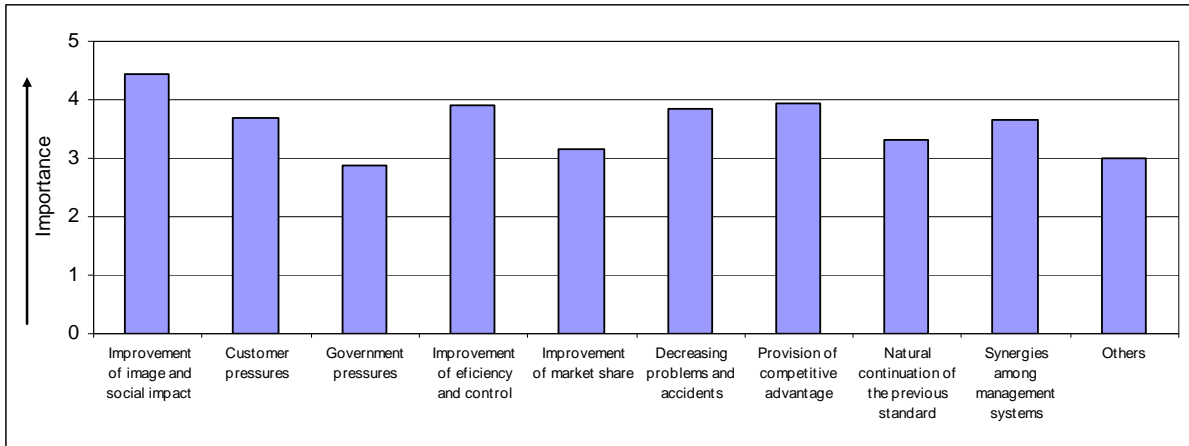


Figure 28: Motivation for implementing subsequent standards

Resources used in the implementation

Taking into account the lack of information about the use made by companies of the books, models and other kinds of information related to the integration of standard management systems (Karapetrovic, 2002A; Karapetrovic and Jonker, 2003), we considered it important to analyse the resources used by companies to carry out this integration. Besides the existing literature in books (e.g. CIDEM, 2004) and articles, there are other resources, such as those provided by the consultants and computer programs, as well as the Spanish UNE 66177 standard for the integration of management systems (Karapetrovic, 1999; Karapetrovic, 2002A).

Most companies who responded to the survey used consultants in the implementation of the second and subsequent standards. The second most used resource was material published by the ISO, which was followed by specialised books and articles. Figure 29 shows the importance of each of the above resources in relative terms.

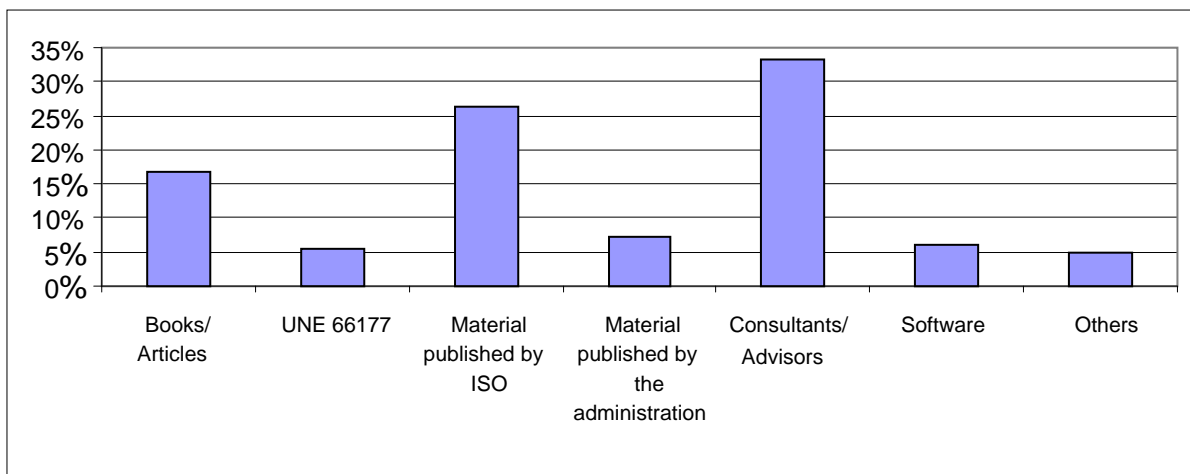


Figure 29: Resources used in the implementation of the second and subsequent standards

2.4 Integration of management systems

Scope of the integration

One of the most interesting issues in the integration of standard systems is analysing the effect of the said integration on the organisations that have been certified as compliant with more than one standard. Since integration is much more logical than disintegration, in other words, than leaving the management systems completely separate, it is to be expected that most companies will prefer integration over separation. It is also important to highlight that integration in this context refers to the set of management systems that covers various functions in a single system and not to the integration of systems that have been designed to cover similar issues. In other words, real integration means having a single management system that includes the requirements of the ISO 9001 and the ISO 14001. It does not mean, however, having a system that covers the requirements of the ISO 14001 and the EMAS regulation, both for environmental management, or one that covers the ISO 9001 and ISO/TS 16949 quality assurance standards.

Figure 30 shows that as expected, 85% of Catalan companies integrate their systems, whereas only 15% have not done so. Most of the organisations (63% to be more precise) have integrated their quality and environmental management systems, whereas 12% have also included the occupational hazards prevention and safety management system. The requirements of a corporate social responsibility management system have only been incorporated in 3% of cases. Although many conclusions can be drawn from these results, it is clear that most of the organisations certified as compliant with several standards have integrated the subsystems these standards represent and, as expected, the scope of the integration includes the more common standard systems: quality, environment and safety.

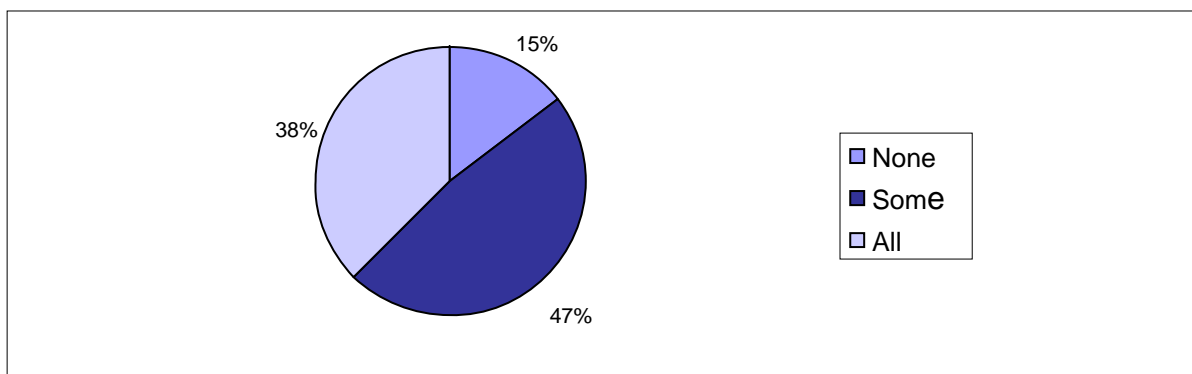


Figure 30: Integration of standard management systems

Tools used in the integration

As Karapetrovic and Willborn (1998A) point out, the integration of standard management systems implies the adoption of a fundamental model for it to be carried out, followed by a superimposition of the requirements of each standard in the model. As Karapetrovic (2005) points out, there are three possible types of model: the process maps used in the ISO 9000 standard family, and the PDCA cycle of the ISO 140000 and OHSAS 18000 standard families, or a combination of the two.

Thus, the survey analysed the use of a process map, the PDCA cycle (Plan-Do-Check-Act), and a company-specific model. It was then determined whether or not the company had analysed the common elements of each standard before carrying out the integration. However, it must be highlighted that some companies responded that they had used more than one tool. The results obtained, which are presented in Figure 31, indicate that in Catalan companies there is a predominance of the use of an analysis of common elements regarding the requirements and of the process map when we refer to the model used. These two methods were used by 93% and 92% of those taking the survey, respectively, and the results were as expected. In addition, 70% of the companies use their own model, whereas 50% used the PDCA cycle at one stage.

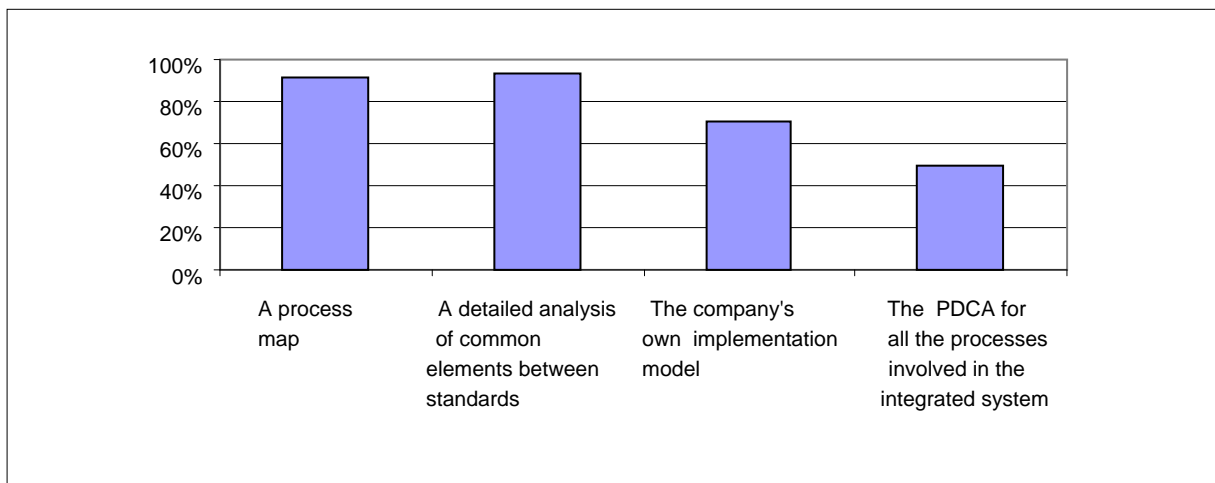


Figure 31: Models applied in the integration of standard management systems

Problems with integration

Although, in general, the integration of standard management systems makes sense, companies obviously come up against difficulties when putting them into practice. These difficulties seem to be related basically to two different issues: on the one hand, the

integration of the standards and, on the other, the internal relations between the management systems in each company.

Although the different standards that are to be implemented may be based on different models, basically management by processes or by the PDCA cycle, and the fact that requirements can often be detected that seem to differ from each other, the said differences should not represent an obstacle for considering the integration of all the standards with which a company wishes to comply into one single integrated management system. Thus, there are already several working frameworks or models that can be useful for harmonising the requirements of standard management systems, and for covering a wide spectrum of existing and future standards. What is important to remember is that if the aim is to create one single management standard, the need for developing and applying more subsystems that cover different areas of the company make the aim more than questionable. Furthermore, consideration must be given to the fact that the internal issues, such as the differences between departmental functions, the lack of resources or the people involved, continue to be the most significant obstacle for integrating standard management systems.

In order to gain a better understanding of the real causes of the integration process problems, two questions were asked in the survey. The first was addressed to organisations that had chosen not to integrate their respective management systems: they were asked for the reasons for not doing so. The second question was asked to the other organisations that had partially or totally integrated their systems; they were asked for the main reasons for taking the decision to integrate the said systems. The results, which can be seen in Figures 32 and 33, respectively, confirmed the theory discussed at the outset.

In considering the main reasons why a certain organisation chooses not to integrate the standards with which it complies, three main issues come to light that are related to the organisation of companies. As can be seen in Figure 32, the categories represented in the fourth, fifth and sixth bars are more common than issues related directly to the standards. In particular, the fact that the work corresponding to quality management, environmental management and other forms of management is being carried out by different departments is the main reason why all the systems are unconnected, with an average score of 3.94; this is followed by the lack of resources (3.06) and the company's interest in the integration process (2.89). Special mention must be made of the fact that the issues related directly to the standards, such as the difficulties involved in understanding them (2.00), the excessive number of requirements (2.10) and the great differences between standards (2.34) are not significant. The possibility of implementing the second and subsequent standards more quickly does not seem to be too important a reason (2.44).

Finally, it must be said that most companies know that integration is possible, since the score for the "did not know it was possible" issue is very low (1.65). Although, overall, they are important, many other reasons, which, in very few cases have not been included in the short analysis, were also detected.

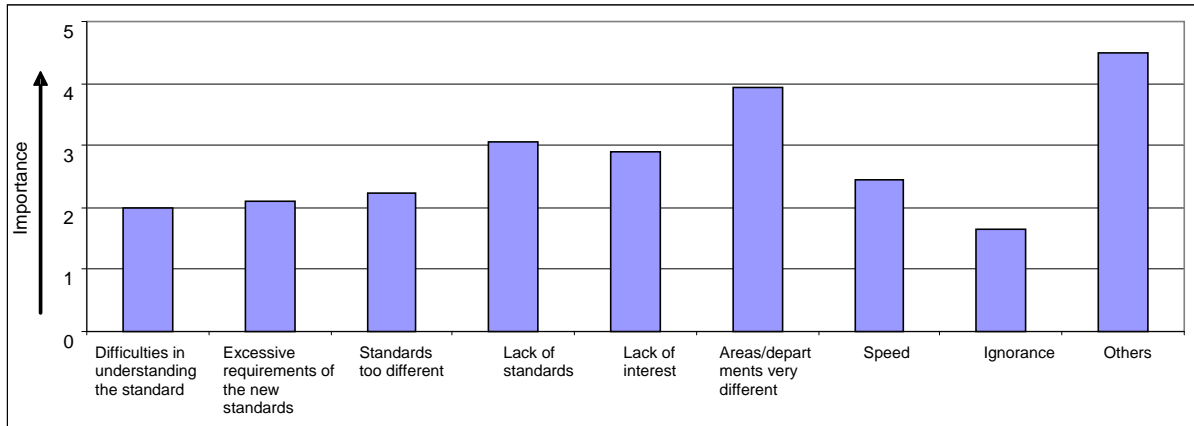


Figure 32: Reasons for not integrating the different standard management systems

As might be expected, in the analysis of the difficulties found in the integration process, most of the factors analysed are reasonably insignificant, since they are all below the average of 3, as shown in Figure 33. The most outstanding issue is the lack of human resources, with only 2.81. It is interesting to observe that this issue is exactly the same as that detected as one of the most important reasons for not integrating the systems. Secondly, reference is made to the lack of support from the authorities, which we understand as related to the financial incentives that were available for the ISO 9001 certificates. The theoretical design aspects of the standard, such as the differences between the models used, have not been given too much importance when the difficulties encountered in this process were analysed.

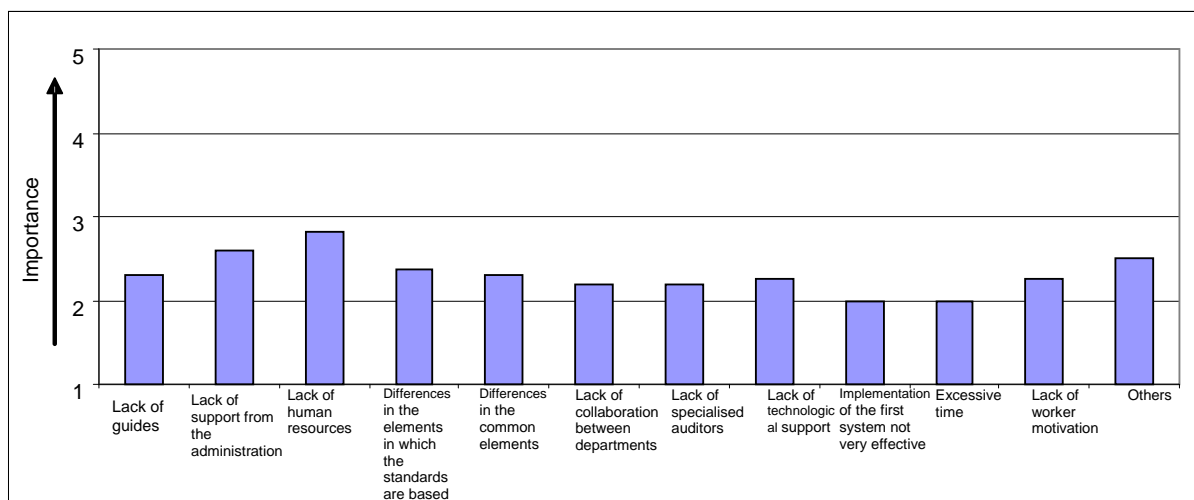


Figure 33: Main difficulties encountered in the integration process

Extension of the integration

Integration, in other words the "fusing together" of different subsystems into a single integrated management system, comprises two mutually related issues. The first directly involves the special characteristics of the integrated management system in the company (e.g. vertical, horizontal or lateral). The second is related to the internal forces that keep the different elements of the system together. We shall explain what is meant by this below.

First of all, the so-called vertical integration refers to when a company decides to integrate the different subsystems at all the hierarchical levels of the organisation, or only at executive or operative levels, thus excluding intermediate levels, for example. The same is possible for the case of horizontal integration. Thus, for example, the integration of support process systems (salaries, customer service, etc.) may take place, or it may be possible to implement lateral integration, which refers to when some branches of the same company are integrated whilst others are left out.

In addition, the forces that keep the integrated system together can be so strong as to make the integration so high that it is almost impossible to differentiate which issues come from one standard and which from another (requirements, for example) or so weak as to create the situation in which a company works with procedures that consist of putting into place two preliminary procedures "one after the other". For example, full integration is based on the preparation of a single management policy and includes a set of integrated processes that use the same resources. Furthermore, lower levels of integration are the result of the fusing-together of one or more of the systems in it, but not of the entire system. For example, a company can have one single manual as the "source" of all the procedures, but it can still have different schemes within the system, completely independent procedures and different audit plans.

Indeed, the concept of standard management systems can be defined from three clearly different elements: objectives, processes and resources. These are the concepts we used in the fieldwork. We analysed the spatial involvement and the forces involved of each group, in accordance with the above annotation. For example, with regard to the individuals involved in the management system, the question was asked whether or not the same individual was responsible for the different subsystems at plant level (inspectors), functional level (system manager) and executive level (organisation's representative). Figure 34 shows the results obtained. Similarly, the integration of resources was analysed on the basis of the policy, objectives, manuals, procedures, work instructions and registers (Figure 35), whereas the

processes were studied by taking into account the fusing-together of different processes that include different activities, such as documentation control or audits (Figure 36).

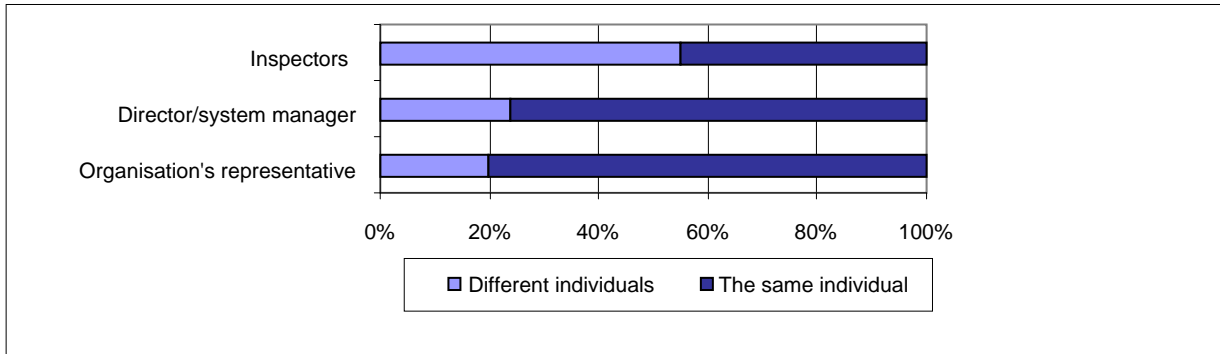


Figure 34: Integration of human resources

As a summary of all these figures, it can be said that Catalan companies integrate their systems to a very high degree. For example, almost four out of every five indicate that their quality management and environmental management systems are represented by the same individual (Figure 34) and that they have one single policy, one set of objectives and one single management system manual (Figure 35). Whatever the case, the strength of the integration seems to diminish when we focus on the more operative and tactical aspects of an organisation. For example, only half of the companies that answered the survey used registers, instructions and procedures that could be considered as integrated (Figure 35). Furthermore, only the elements of the management systems that have similar or identical requirements in all the standards, such as documentation control, system review or audit, seemed to have a high level of integration (Figure 36). However, the integration of planning, the determination of requirements, the manufacture of products and other internal procedures is much lower. Given that, as we have seen, most companies make an analysis of the common elements in the different standards before carrying out integration, these results should come as no surprise.

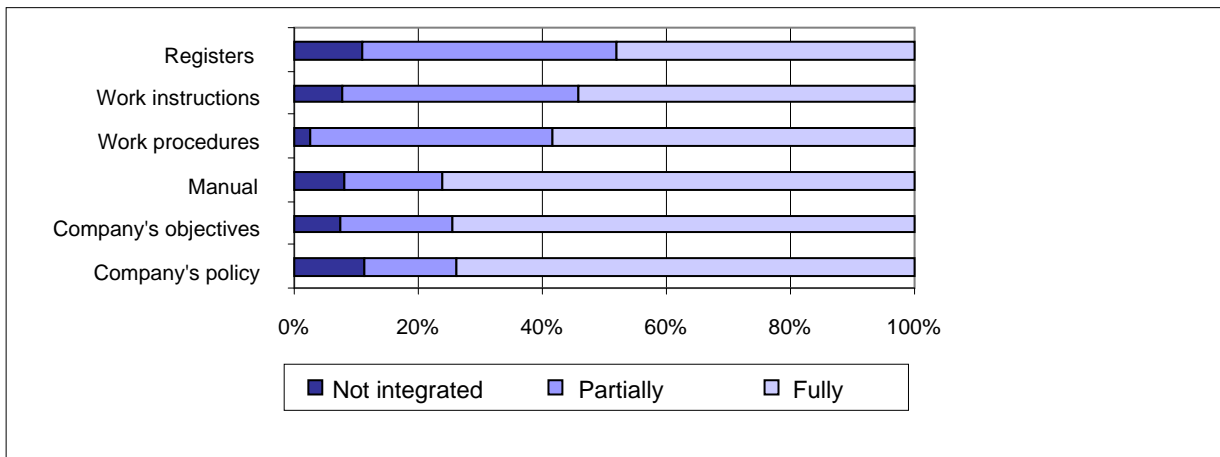


Figure 35: Integration of documentation

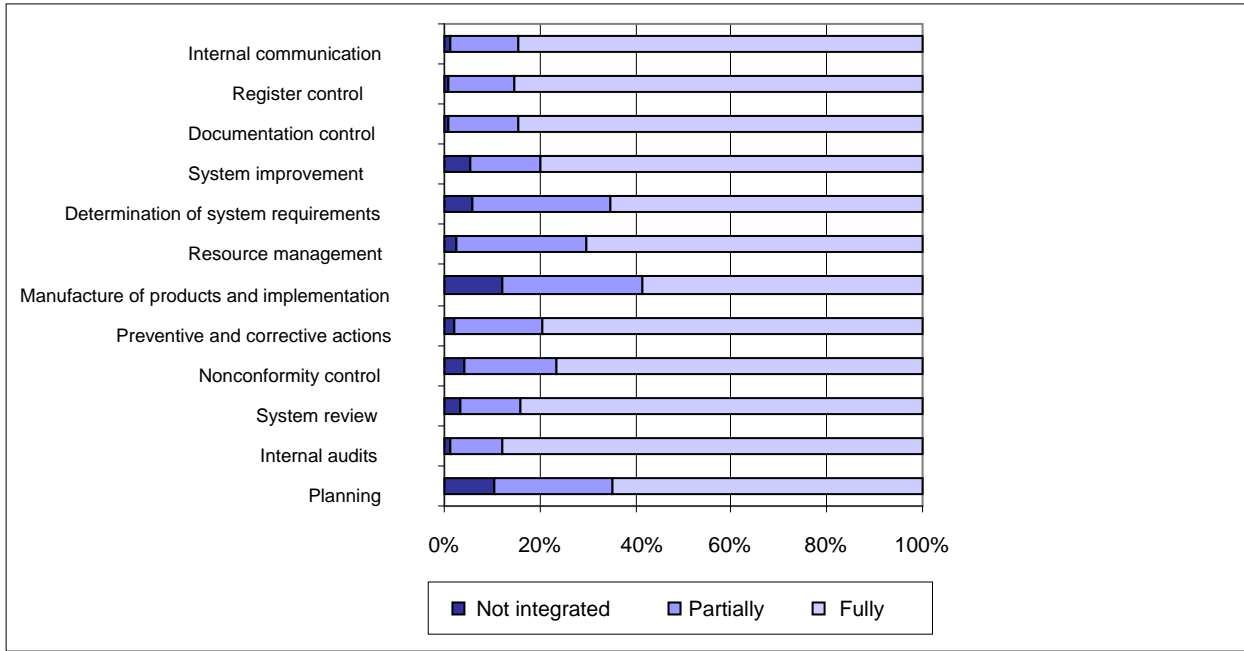


Figure 36: Integration of procedures

2.5. INTEGRATION OF AUDITS

Audit results

When audits are carried out on several standard management systems, besides providing information about the assessment of the implementation of the system regarding each standard, information should also be given about the possibility of integrating the different systems and improving them. This can be done, for example, by identifying the possibilities and ways of integrating the systems more effectively and efficiently.

Figure 37 shows that in most of the audits carried out in the companies certified as compliant with the ISO 9001 and ISO 14001 standards, information was provided about how to improve the integration of the system if it is integrated and how to integrate it if it is not. Once again, this percentage is quite high when external audits are analysed (66%) in comparison with internal audits (55%). The percentage of organisations that only detect non-conformities is almost identical to that of companies that only comply with one of the two standards: 20% in the case of internal audits and 9% in the case of external audits.

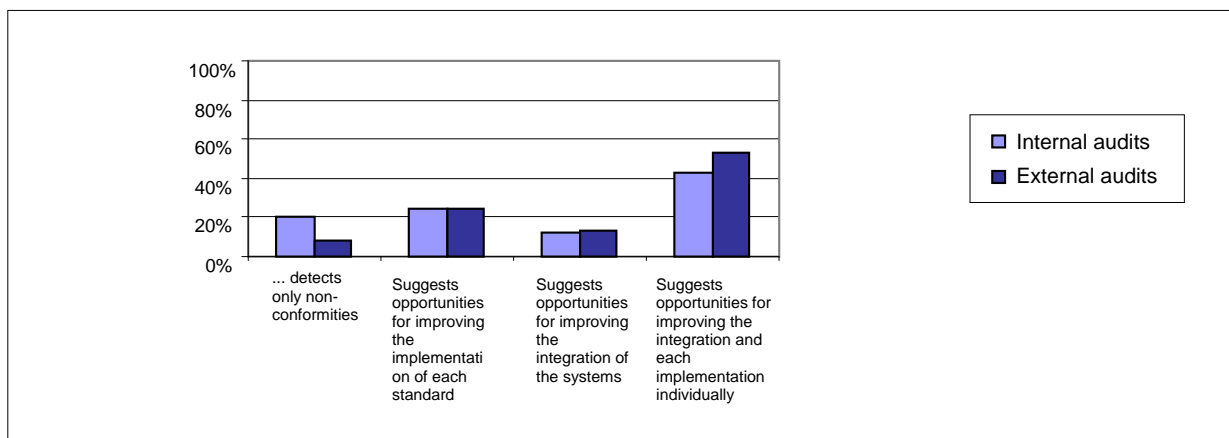


Figure 37: Results obtained in the audits

Integration of the audits

Although standard management systems focus on solving certain functions (quality, environment, etc.), audits have had a direct influence on different departments and functions in companies. This is due to the fact that quality, the environment, finance and other types of audit systems share several principles and processes and to the fact that the auditors have benefited from the first standard officially designed to cover different management systems: the ISO 19011 standard. Despite the fact that an integrated audit of various management systems would provide many benefits and, indeed, that would seem to be what organisations

would want, several theoretical and practical problems prevent this from being so. For example, although the audit processes can be integrated easily, the problems that may arise when the requirements of several standards contradict each other remain to be solved. Furthermore, neither the ISO 19011 nor any other ISO document currently in use regarding the integration of management systems has any methodology for carrying out an integrated systems audit.

In order to analyse the integration of the audits in greater detail, one part of the study of the Catalan companies with more than one certificate focused on examining their perceptions of the meaning of this integration. They were also asked which of their auditing subsystems had been integrated. In their answers, they described both internal and external audits and placed particular emphasis on the main elements of their audit systems: objectives, processes, inputs, outputs and resources. The results related to the objectives of the audits are given below and the following sections refer to the integration of these resources and to the processes used for audits.

In general, there are many interpretations of the meaning of an "integrated audit". In theory, since an audit is a system, its full integration requires the establishment of one single audit system for all of a company's functions that covers all of its objectives, processes and resources. However, in practice, this integration may be reduced exclusively to sharing certain system components. For example, the audit systems for the quality, environment and safety management systems can be carried out at the same time in order to prevent interruptions affecting the audited companies, but they can be carried out by different auditors, with different audit plans and independent reports. Of course, there may be other similar combinations, such as different auditors carrying out audits at different times or, albeit at the same time, on different departments or processes. Figures 38 and 39 below show the results related to the time and human resources involved in the integration of the audits.

Figure 38 clearly shows that most of the Catalan companies carry out their audits simultaneously. This percentage is particularly relevant in the case of external audits (73%, in comparison with 68% for internal audits). These figures are easy enough to explain as there is growing pressure for audits to be carried out simultaneously (Karapetrovic, 2002B): this strategy saves time and costs. Approximately only one fifth of audits are carried out at different times.

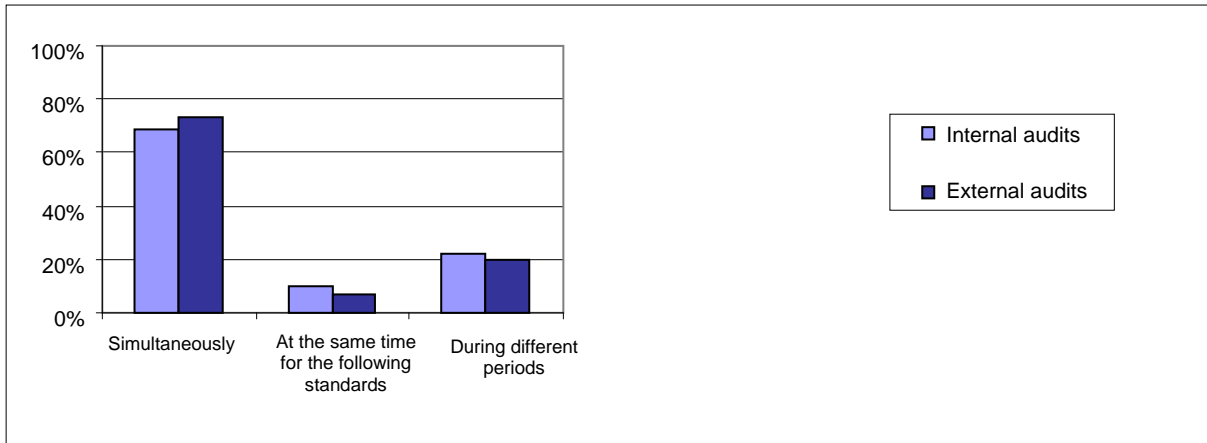


Figure 38: Timing of audits

It seems that a similar level of integration has been reached regarding the unification of the auditors and audit teams (Figure 39). However, there is a higher level integration in the case of internal audits, which is reflected by the fact that almost 73% of companies rely on a single team of auditors, in comparison with 59% of external auditors. Thus, the proportion of organisations that draw up separate financial reports is much lower for the internal audits (20%) than for the external audits (33%). This may come as a surprise, but if we consider all the related results obtained (e.g. the inputs and outputs of the integration or the time required to perform an audit), as well as certain factors that can influence audits (e.g. the experience of the auditors, the size of the companies, the resources, etc.), this would appear to be quite logical.

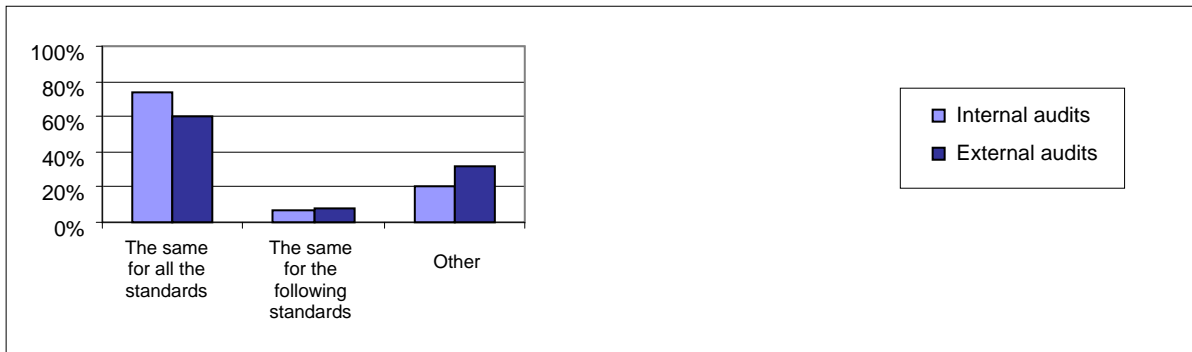


Figure 39: Performing audits

With regard to the resources related to the audit, two figures show the results related to the integration of the audit processes. Figure 40 shows the relevance of the integration by taking into account the inputs of an audit process, i.e. the audit plan, and the output, in this case the reports. In addition, Figure 41 shows us the way in which the audit process is carried out with regard to the system that has to be audited. In other words, whether the various standard management subsystems are seen as two different systems, two interrelated systems or one single integrated system in the audit process.

The integration of the inputs and outputs of the audit process shows results that are similar to the way in which auditing objectives and resources are integrated. As can be seen in Figure 40, most of the audits have one single audit plan and one single report (69% for internal audits and 59% for external audits). However, this proportion is 10% higher for internal audits, which is obviously similar to the proportional difference between the audits performed with separate reports and plans (only 17% in the case of internal audits and 29% in the case of external audits).

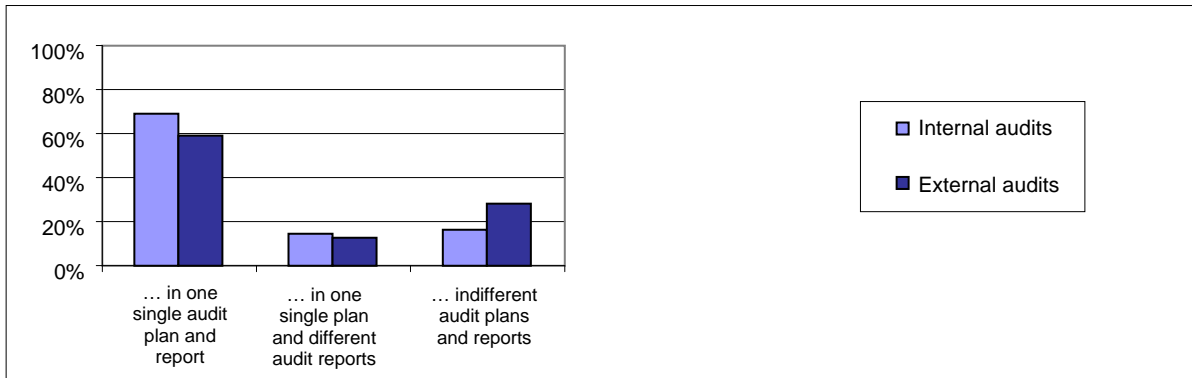


Figure 40: Integration of the audit documentation

A high level of integration has also been detected in the analysis of the subsystems that are to be audited (Figure 41). In particular, only 15% of the companies perform internal audits on different management systems and only 19% of the external auditors do the same. These figures are very similar to those detected in the analysis of the number of companies that do not integrate their standard management systems (15%). The remaining 85% in the case of internal audits and 81% in the case of external audits are performed when the system to be audited is completely integrated and closely related.

In the case of internal audits, the percentage of audits on the integrated systems is even higher (54% in comparison with the 47% of the external audits).

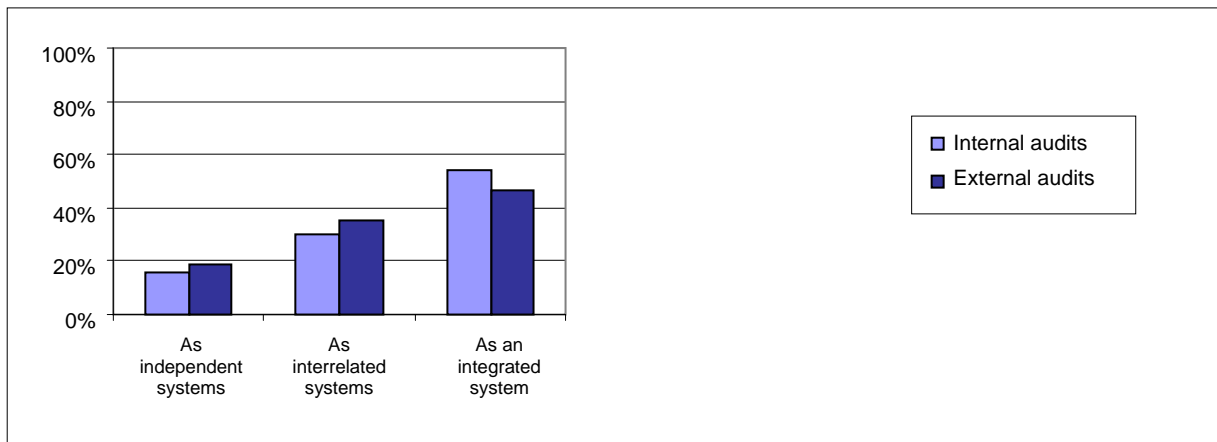


Figure 41: Integration of the system to be audited

Audit requirements

Besides analysing the current status of the audit system in Catalan companies, we consider that it is also important to detect their present and future needs. For example, we can ask ourselves what the real demand for an integrated audit system is, how external audits are performed, and what companies' expectations are regarding the type of results audits should come up with.

Figure 42 shows the results obtained in the survey to the question related to what is asked of audits. It clearly shows the great importance given to the integration of audits. For example, of the 10 issues mentioned in relation to the audits, maximum importance is given to the possibility of performing the audits simultaneously (4.27), followed very closely by the need for the audits to suggest opportunities for integrating management systems (4.23) and the demand for performing audits as one single integrated system (4.19). Considering that the integration of the audits, especially external audits, is by far the most commonly mentioned benefit in the analysis of the integration of management systems, these results come as no surprise.

Another major need is related to the elements involved in the integration of audits, e.g. the unification of audit plans (4.04) and reports (3.96), as well as auditors (3.93). It is also important to draw conclusions on the improved implementation of each of the different standards (3.79) and to ensure that audits are performed by focusing on an organisation's processes (3.62). As Karapetrovic (2002B) and Karapetrovic and Willborn (2002) pointed out, organisations may not perceive a significant need for having an integrated audit system or for increasing the number of stoppages in the "normal" work processes generally brought about by an audit. These ideas are fully supported by Catalan companies, since these two issues are by far the least valued in terms of importance, together with the fact that the ISO

19011 or any other standard is used as a model. Thus, it is clear that companies want a fully integrated system, but, of course, it must be effective and efficient

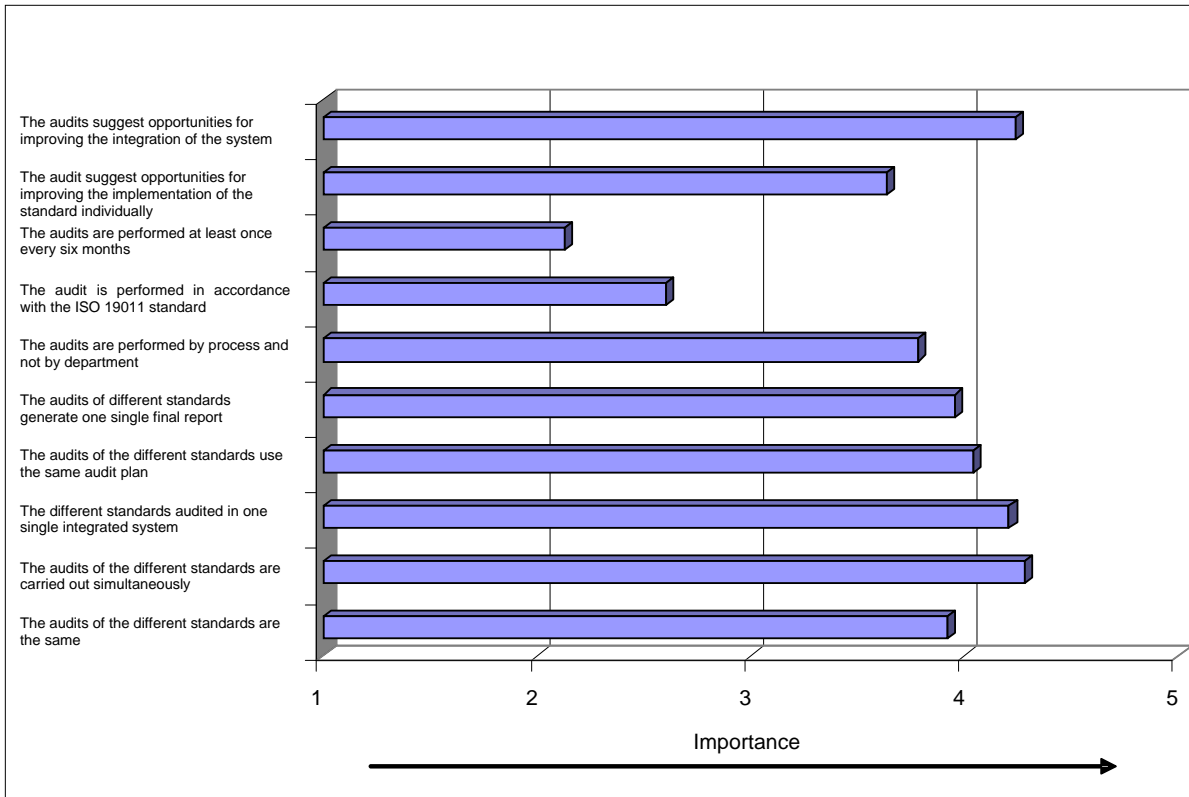


Figure 42: Characteristics required of the audit management systems

3. THE FUTURE OF QUALITY MANAGEMENT IN CATALONIA

Continuous improvement: possible ways

At this stage, a couple of questions remain to be answered. Does a company that is certified as compliant with the ISO 9001 standard still have to implement more standards? Is there still more work to be done? Without a doubt, the answer is yes. The ISO 9000 standard family has been a very good tool for allowing the organisations to understand the way in which they must proceed, but this process has only just begun. Following the scheme put forward by Camisón et al. (2007) (see Figure 43), the way open to organisations to reach excellence comprises 10 clearly differentiated stages. Although subject to debate, obtaining the ISO 9001 certificate is only on a par with the third of these stages.

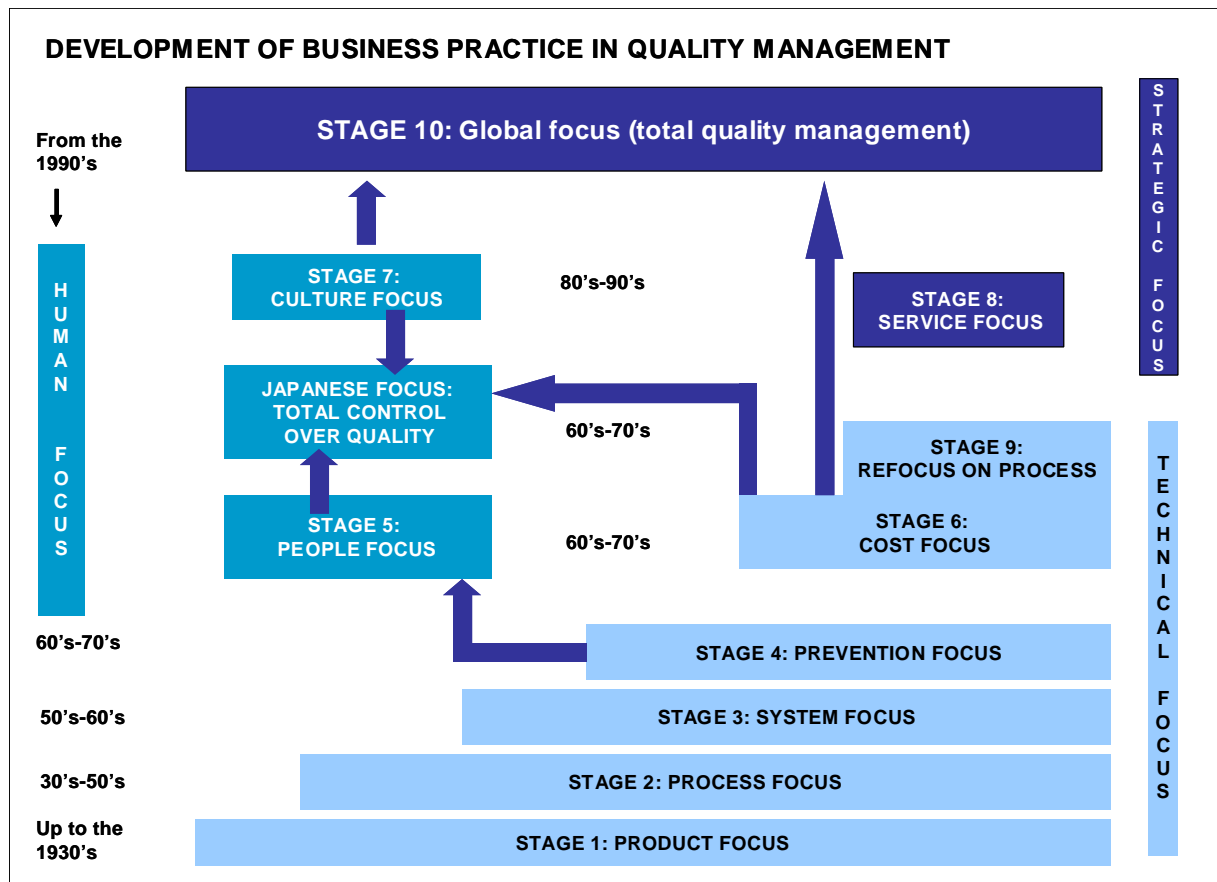


Figure 43: Stages of business practice in quality management (Camisón et al., 2007)

Thus, do the 9000 Catalan companies certified as compliant of the approximately 400,000 that exist in our region still have seven stages to go through? It is difficult to make swooping statements to this regard. However, if a company takes a little time for reflection, it may be able to determine the current level at which it stands. For example, if a certified company

gives extremely poor service, this may mean that it is still not particularly focused on service (Stage 8). If a certain number of workers in certified companies are not fully satisfied with their jobs, this may be because the organisation is not focused on people (Stage 5).

If each of the stages presented by the abovementioned authors or by others in similar models are considered one by one, it will become clear that the so-called "technical focus" of the previous model has improved greatly in recent years. However, there is still a great deal of work to be done regarding the "human focus" and "strategic focus", which are issues that started to appear in the literature in the 1960s and 1970s.

Here, we can draw one very clear conclusion: there is still a great deal of work to be done. Therefore, what can we do? This will depend, of course, on duties and responsibilities, but since the ISO has made a move by committing to support standards, some authors are now predicting the direction this movement will take. Accordingly, Professor Karapetrovic shows a model that can give us a few clues (see Figure 44).

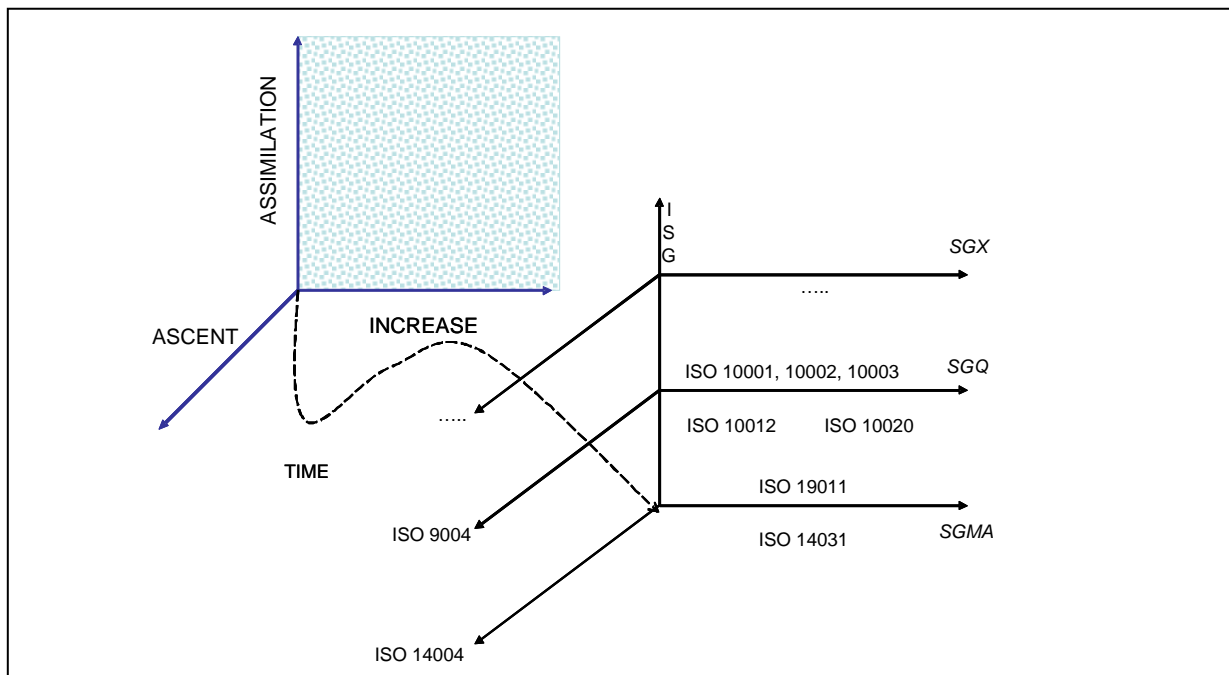


Figure 44: Directions of the development of the application of standard management systems

Using terms taken from the early episodes of the series Star Trek, Karapetrovic (2005) speaks of three possible directions for improvement: ascent, increase and assimilation. Let us consider this in stages:

- The **ascent** refers to the increase in the capacities of the standards or models that have been implemented. For example, a company that has been certified as compliant with the ISO 9001 standard would opt for ascent by implementing the ISO

9004, the EFQM model or even the well known 6 Sigma practices, since all of them would improve its quality management system. In addition, another company that has implemented the ISO 14001 standard would choose this possibility if it decided to comply with the EMAS regulation to continue improving its environmental management. In some way, these organisations would choose tools, models or standards that would help them continue along a road they had already begun.

- The **increase** refers explicitly to the implementation of the new support standards for improving specific functions or issues in an organisation. Thus, a company that is certified as compliant with the ISO 9001 standard could implement but not certify standards such as the ISO 10001:2007 family for improving customer satisfaction (Guidelines for Codes of Conduct for Organisations), the ISO 10002:2004 (Guidelines for Complaints Handling in Organisations) and the ISO 10003:2007 (Guidelines for Dispute Resolution External to Organisations) or the ISO 19011:2002 standard for managing the audit subsystem. Through standardisation, each one would improve certain specific processes of the organisation. Given that, at the present time, different new standards are being developed along this line, e.g. the ISO 10004 standard for measuring customer satisfaction, this is one of the directions anticipated to have the greatest impact in the very near future.
- The concept of **assimilation** refers to improving new areas in companies. In other words, the same applies as was presented on quality management. Namely, companies should strive to tackle new issues, such as environmental management, based on the implementation of the ISO 14001 standard, corporate social responsibility or occupational hazards prevention management. All these new work issues should be integrated, which explains the term "assimilation", into one single global management system that would take the organisation to the desired Stage 10 of the model put forward by Camisón et al. (2007).

Of course, there would still be one final possibility, which is that of doing nothing and holding on to the ISO 9001 certificate as the final "step" taken on the road towards continuous improvement. Whatever the case, the baseline in the above figure includes organisations that have implemented only one standard, more than one or none at all.

Further in this section we shall use this terminology to analyse its future impact in Catalonia. Thus, to discover the opinion of Catalan companies regarding the future of quality, certain questions were asked regarding the direction they expected this "world" or "culture", as some call it, to take. In one specific question, four possible alternatives were included to indicate the different directions: increase ("adding new support standards in particular areas of company, such as claims management or measurement systems"); assimilation ("adding new standards related to the management of one area of the organisation, such as occupational safety or corporate social responsibility"); assimilation ("using models of excellence, such as the EFQM"); or not doing anything at all ("not adding any standards or models").

The results obtained are shown in Figure 45, with an excellent global view of the importance of the development of new standard management systems and, therefore, their implementation in Catalan companies. First of all, special mention must be made of the fact that most of the companies that took the survey are interested in using the standards in the near future, since there are at least five times more companies that suggest they will add new standards or models in comparison with those who indicate, as a first priority, that they will do nothing in this field at present. Secondly, it seems that the "assimilation" and "ascent" directions hold a certain advantage regarding the use of models of excellence. Finally, although the "ascent" and "assimilation" directions have a certain importance, the "increase" standards (i.e. those of the future) seemed to stand out clearly above the rest.

In our opinion, it is also interesting to compare the figures in more detail as to whether the companies are certified only as compliant with the ISO 9001 standard or also with the ISO 14001 standard. In the first group of companies, the main priority was as follows: in 31% of the cases, to add new "increase" or support standards; in 27%, to add new "assimilation" standards; 24% were interested in "ascent" models; and 18% choose no alternative related to standards. The same questions asked to the companies certified as compliant with the ISO 9001 and ISO 14001 standards gave the following results: 43% "assimilation" standards; 22% "ascent" standards; 20% "increase" standards; and 15% none. These results can be analysed as meaning that organisations that comply only with the ISO 9001 standard focus on or are interested in improving through support standards, such as those related to

improving customer satisfaction, whereas this is not true of the companies with more than one standard implemented, which simply choose "assimilation": new standards that cover more areas of the company.

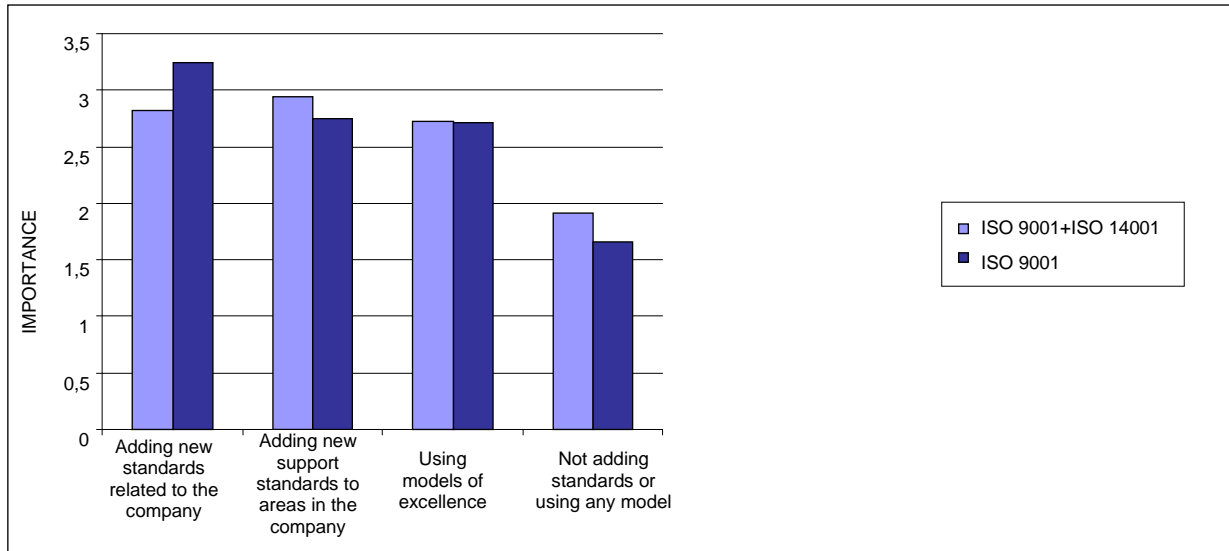


Figure 45: Future use of management standards

Another aim of this study is to gain a better understanding of the past, present and future of the different standards implemented in Catalan companies. The use of the support or "increase" standards has been analysed on very few occasions in the specialised literature, despite the importance we expect them to have in the very near future. Thus, the survey asked questions on seven "increase" standards, as well as on a further seven "assimilation" standards in order to discover their impact. It must be said that standards such as the ISO 9004 were not included, given the number of studies already available, and, in particular, due to the substantial changes that have occurred lately, which could lead to confusion.

Standard	Title	Status	Type
ISO 10001:2007	Directives for the code of conduct	Development	Increase
ISO 10002:2004	Directives for handling complaints and claims	Current	Increase
ISO 10003:2007	Directives for the external resolution of customer complaints	Development	Increase
ISO 10006:2003	Directives for quality management in projects	Current	Increase
ISO 10014:2006	Directives for making financial and economic profits	Current	Increase
ISO 14031:2001	Evolution of environmental behaviour	Current	Increase
ISO 19011:2002	Directives for auditing quality and/or environmental management systems	Current	Increase
ISO 14000:2004	Environmental management system	Current	Assimilation
OHSAS 18000:1999	Occupational hazards prevention and safety management system	Current	Assimilation
UNE166000 Ex:2002	I&R&D management	Current	Assimilation
UNE66177: 2005	Directives for measuring, monitoring and analysing customer satisfaction	Current	Assimilation
ISO 26000	Corporate social responsibility management	Development	Assimilation
ISO 27001:2005	Information security management systems	Current	Assimilation
ISO 28000:2005	Specifications for the security of supply chain management systems	Current	Assimilation

Table 3: Increase and assimilation standards used in the study

Figures 46 and 47 show the results obtained regarding the selected standards, which are also described in Table 3. As can be seen, the great majority of Catalan companies were unaware of the existence of the standards or were not very sure whether they would implement them in the future. Taking into account that many of the standards are very new (e.g. the ISO 10002 or ISO 27001 standards), these results come as no surprise. Indeed, the standards that were published some time ago, such as the ISO 19001 or the ISO 14001 standards, are by far the best known and most widely implemented.

In addition, despite the fact that most of the organisations appear to indicate that they will not use the standards selected in the future, in comparison with the companies that will consider doing so, the low level of awareness about them and their very nature suggest that they will be very relevant in the near future. For example, although 27% of the companies stated that they will not implement the ISO 10002 in the future, 33% replied that they have already done so or intended to do so in the future. If we consider the total number of companies certified as compliant with the ISO 9001 standard, there is evidently great potential for the application of the ISO 10002 standard in the future. This is particularly true if it is considered that it

covers only one component of the quality management system, specifically, the management of customer claims and complaints. The fact that two thirds of companies are considering implementing the ISO 14001 and OSHAS 18001 standards in the near future is also an encouragingly high proportion.

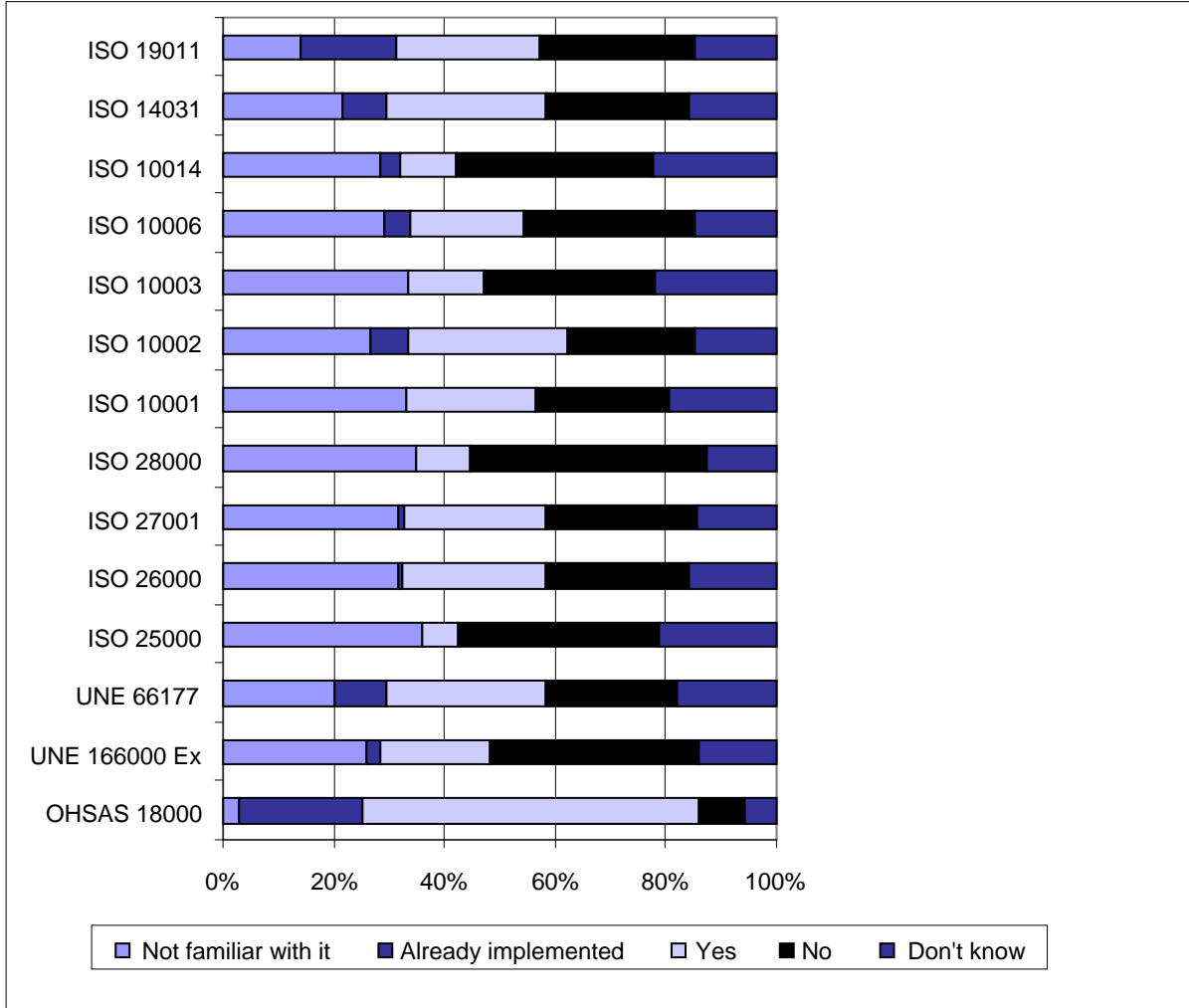


Figure 46: Importance of certain increase and assimilation standards

Development possibilities of future standards

The issues related to the standardisation of management systems can generally be divided into two main categories: on the one hand, that which refers to the standard itself, and, on the other, the environment of the said standard, as well as the certification, guidelines, etc. In accordance with this classification, questions were asked in the survey to examine the outlook for Catalan companies depending on the use they made of the standard management systems, which has already been discussed in the previous section. The companies were also asked to give their opinion on what the new management standards should be like in terms of structure, certification, etc., which will be looked at in this section.

With regard to the areas in which the development of new management standards could be useful, the survey reveals a significant demand for the standardisation of processes related to customer service, with a score of 3.90 out of 5. A further four areas have very similar scores of between 3.45 and 3.65. More specifically, this refers to purchasing, maintenance, information technology and human resources. The standards that could hypothetically be designed for the financial area of the company are those given the lowest importance, with a score of 3.02. Although the ISO has already created various documents in the areas selected by Catalan companies, such as the 27001 standard for the management of information technology or the ISO 10001, 10002 and 10003 standards for customer satisfaction management, the ISO's TC176 (Technical Committee 176) is deciding on the possibility of developing a new standard for human resources management in the area of quality management. These results are very interesting, since they reflect the views of Catalan companies on the development of new standards. Figure 48 shows all the figures obtained on the issues discussed above. It can be seen that there are few differences between the companies that comply only with the ISO 9001 and those which are also certified as compliant with the ISO 14001.

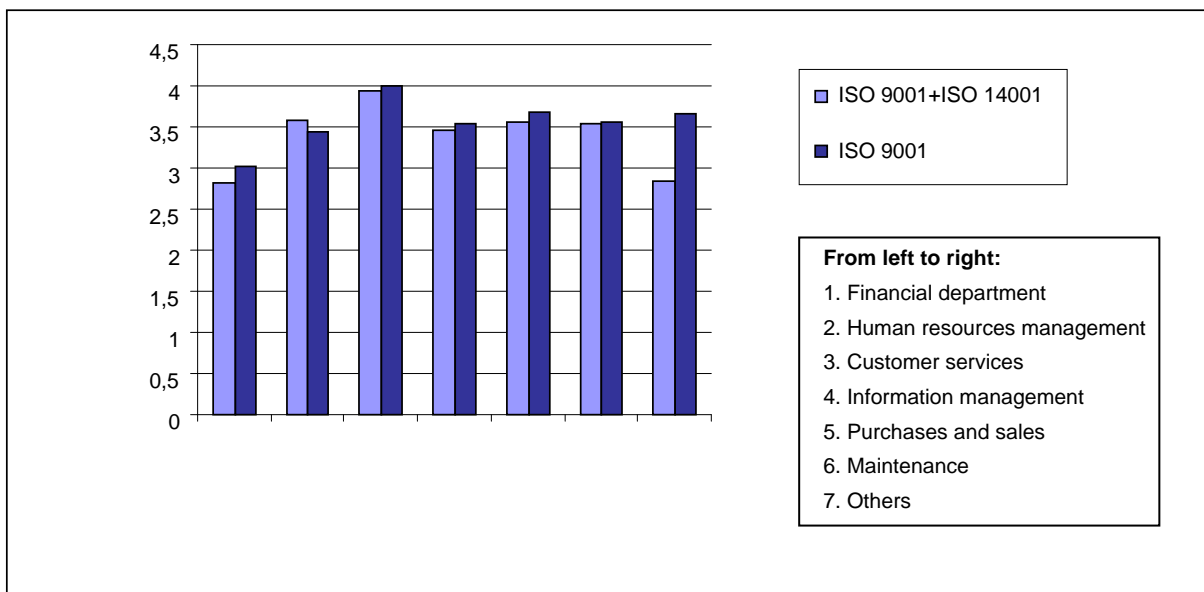


Figure 47: New possible areas of standardisation

With regard to the question as to whether or not the new standards that may be developed should be certifiable, there are many arguments for and against doing so. Given the varying nature of all possible standard management systems, it is difficult to lay down hard and fast rules to govern them. However, all new standards must be auditable or it must at least be possible to assess the system in comparison with a given model the subsequent improvements made to it. Of course, this does not only make sense for the so-called assimilation standards, but also for the rest. Indeed, in a situation in which there are many

standard management systems, which cover many different functions in the same company, an integrated audit system is more effective and efficient than the individual development of audits.

The results of the survey, which are given in Figure 49, suggest that companies place more emphasis on the renewal and integration of the certification processes for the new standards. These two issues give levels of importance of 4.14 and 4.22 out of 5, respectively, when the figures of all the surveys are weighted. The idea that all the new standards must be certifiable has an average importance of 3.58. As might be expected, the companies that have several certifications are those that place greater importance on integrated certification (4.32, in comparison with 3.94 for the possibility of renewing the certificates, and 3.43 for the possibility of the standards being certifiable). Thus, the companies that only have the ISO 9001 certification slightly prefer the renewal of certificates (4.24) over the possibility of carrying out integrated certification audits. However, they give a score of 3.59 to the importance of the new standards being certifiable.

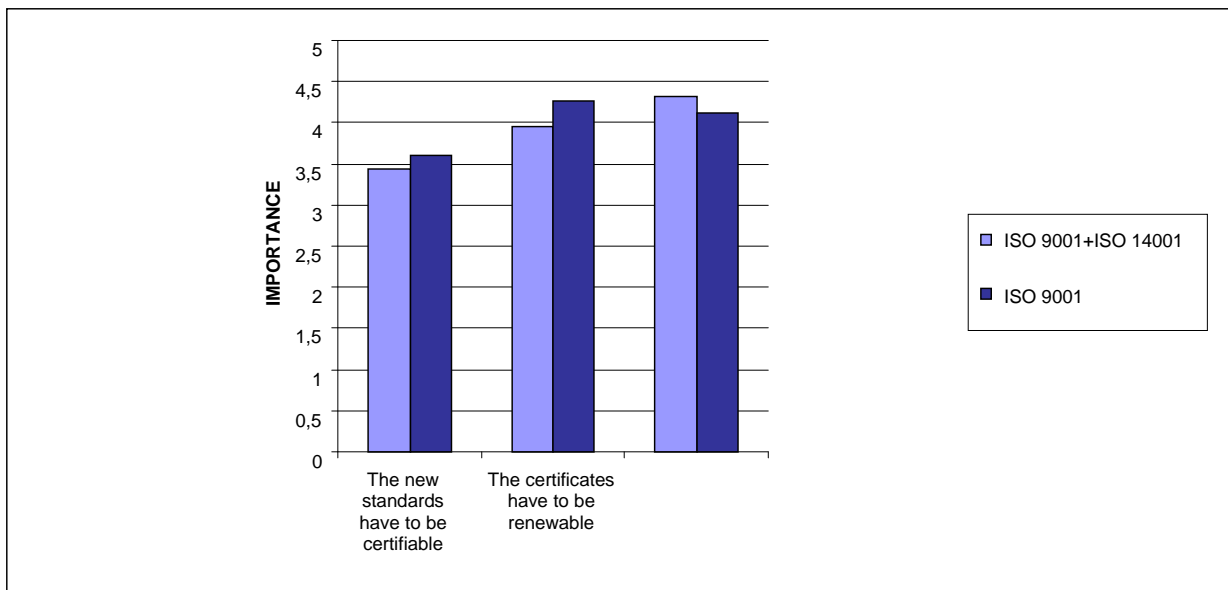


Figure 48: Certification of the new standards

Although most of the hypotheses put forward in the above sections are confirmed when an analysis is made of what happens in Catalan companies, the last section of the study is somewhat more surprising. Despite the fact that various studies have shown that it is not altogether beneficial to establish one single integrated standard that covers a company's main concerns, the answers obtained from Catalan companies suggest exactly the opposite. The survey asked which of the five alternatives given regarding the format of the management systems was considered the most relevant. Figure 50 shows the results obtained in order of importance. It can be seen that the two groups of companies prefer to

"integrate the different standards into only one" over the rest. The second alternative chosen, which is actually nearer to the first in order of preference (a score of 3.67 in comparison with another of 3.53, respectively), refers to the creation of one single base standard to which new specific requirements would be added in separate standards. The remaining three alternatives, with a much lower level of importance, obtained scores of 3.06 (rewriting the standards with identical common requirements), 2.94 (leaving them as they are and adding an integration method) and 2.31 (making no change), respectively.

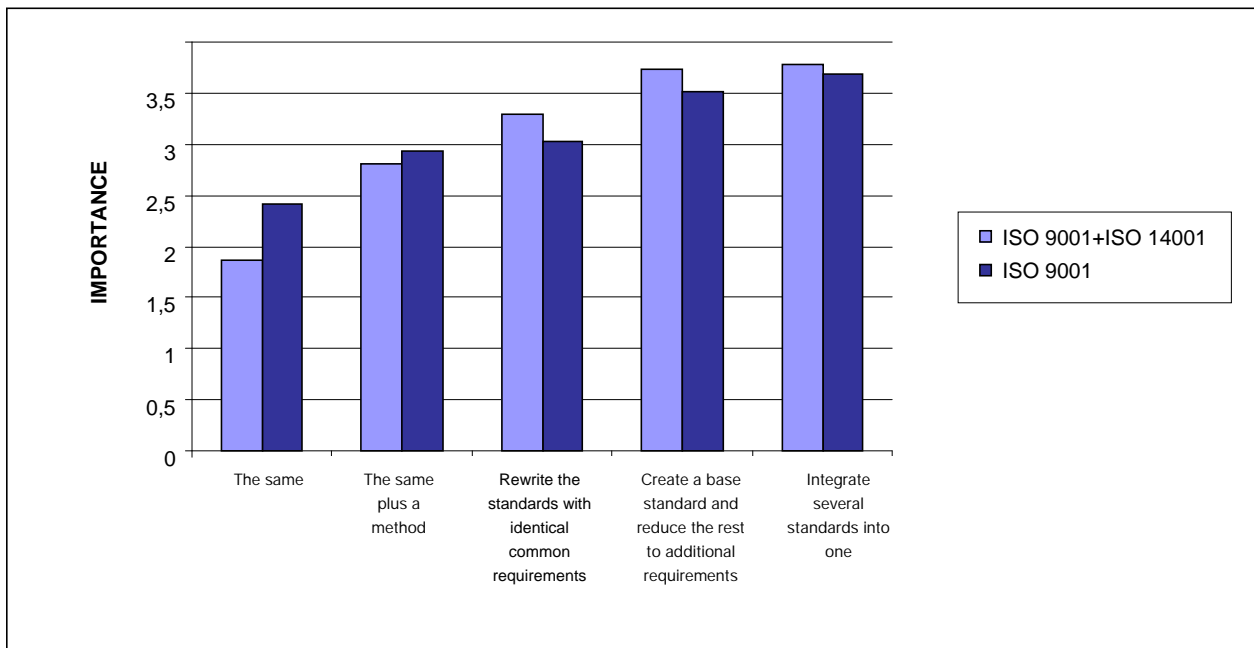


Figure 49: Future format of the standard management systems

A more detailed analysis of the answers obtained might help us to clearly understand the reason for the options chosen. In our opinion, for example, the option to integrate several standards into one single standard is understood when it is remembered that Catalan businesses are largely unaware of existing guidelines, as shown in Figures 46 and 47. If we were to consider this fact and the difficulty involved in integrating all the standards into one, the option chosen would quite possibly be the second, which would be based on designing a basic standard to include the common procedures, such as audits and documentation control. The other standards would simply be a set of additional requirements to be added directly to the management system as a plug-in.

4. CONCLUSIONS

Having analysed the data obtained in this study, in which a large number of Catalan companies took part and, therefore, which can be said to be highly reliable, it has become clear that there is a high degree of satisfaction with the implementation of the ISO 9000 standard.

In short, in the eight-year period from 1998 to 2006, both the average period of time required to implement the ISO 9000 and the associated implementation and maintenance costs have fallen. Indeed, all the variables analysed have improved during the period under study, with one small exception: the benefits provided by the ISO 9000 standard, which have fallen very slightly.

To a certain extent, these results are fully in line with the environment from which they were drawn. In the first place, this period was characterised by a significant increase in ISO 9000 certificates in Catalonia, which reached the symbolic figure of 9000 companies currently certified as compliant. This has reduced the possibility of obtaining competitive advantages by obtaining the certificate. Moreover, this has also been accompanied by a very significant reduction in the implementation and maintenance costs associated with quality management systems. Secondly, the resources available for establishing an effective and efficient system for managing the quality system have improved considerably over the last eight years. This is due not only to the significant improvement of the standard in 2000, but also to the increase in the experience drawn from the implementation and maintenance of the system and to the efforts made by the government (training, publications, etc.). All this has possibly altered companies' perception of the standard, which seems to have changed from the initial euphoria of the first years when it was implemented to a more realistic situation regarding both short- and long-term benefits, which, have indeed been very considerable.

Furthermore, organisations are indeed highly satisfied with the implementation of new and older standards. In fact, special mention was made of the fact that many companies continue to make a commitment to the generation and subsequent implementation of new management standards that cover certain areas of the company as one of their new challenges for the future.

Special mention must also be made of the level of awareness in Catalan companies of what we have called support or "increase" standards in management systems. Although not certifiable by independent external bodies, one example of an "increase" standard would be the ISO 10002 standard, which is related to external customers. However, despite this, there

are a significant number of companies that are completely unaware of the existence of the standards, despite the positive impact they are able to bring about. If certified companies are unaware of them, it is easy to imagine the position of those that are not certified. Without a doubt, there is still a great deal of work to be done in this field both by companies and by the bodies involved (consultants, public authorities, training centres, etc.).

For the future, the phenomenon of the expansion of standard management systems has, in our opinion, a number of strengths and weaknesses, which we shall summarise briefly. We must remember that one of the main strengths of the expansion of these systems is related to the fact that it is increasingly easier to implement new management standards since organisations are already familiar with them. This is even more relevant if we consider that standard management systems have parallel structures (manual, procedures, etc.). Thus, when the publication of the ISO 9000 and ISO 14000 standards is analysed in every industrialised country, it becomes clear that the countries closer to implementing the ISO 9000 are also closer to implementing the ISO 14000, albeit with a certain delay. As shown in the study, this conclusion is upheld by the fact that the organisations that have implemented one standard have to make much less of an effort to implement other standards that are related to the first.

However, mention must be made of the fact that there is a high level of consensus regarding the importance of the new standards that belong to different spheres of management being integrated into one single management system; otherwise, the implementation and isolated certification of the various management systems would be highly negative from the point of view of production. In fact, it was found that 85% of Catalan companies work with standard management systems that are integrated into one single system.

However, consideration must be given to the fact that owing to the disproportionate publication of the management standards, there is a clear danger of market saturation and confusion, which affects the image projected by the certificates. This is of great importance, since it is one of the factors companies take into consideration when they implement standards. Therefore, we are of the opinion that the image per se of the certificates associated with these standards is not static. The economic-financial analogy would seem clear: the intrinsic value of the certificate is inversely proportional to the number of certificates in circulation.

We consider that the national and international bodies that develop and prescribe these standards (foundations, associations, certification bodies, consultants, etc.), as well as public authorities, should make a special effort to prevent excessive confusion. This is particularly significant if it is taken into account that those who apply the standards correctly are highly satisfied and, therefore, will be prepared to implement others if they find them useful. Tools

that give rise to progress along the road to continuous improvement must not be set aside simply because they are difficult to understand or are a source of confusion.

Shortly before his death, the famous writer Pere Calders wrote on the eternal debate about the quality of the short stories he wrote in comparison with the novel: "We discuss the aristocracy of the novel over the commonness of the short story and, when all is said and done, nothing has changed: we carry on, which is more than sufficient". At this stage, therefore, a number of questions remain open to debate. Is the same thing happening in the world of quality in Catalonia? Where are all these tools, models and standards taking us? What is happening in the world of management in general? We take a positive view of such matters, and clear answers should be given to the questions asked. However, our everyday experiences with services might not lead us to jump to such positive conclusions so readily. Undoubtedly, we cannot allow organisations to "... carry on, which is more than sufficient", they must be guided and all they need is a "favourable wind".

5. REFERENCES

1. Beattie, K. R., Sohal, A.S. (1999), "Implementing ISO 9000: A study of its benefits among Australian organizations", *Total Quality Management*, Vol. 10, No. 1, pp. 95-106
2. Beckmerhagen, I.A., Berg, H.P., Karapetrovic, S., Willborn, W. (2003), "Auditing in Support of the Integration of Management Systems: A Case from the Nuclear Industry", *Managerial Auditing Journal*, Vol. 18, No. 6, pp. 560-568
3. Boys, K., Karapetrovic, S., Wilcock, A. (2004), "Is ISO 9004 a Path to Business Excellence? Opinion of Canadian Standards Experts", *International Journal of Quality and Reliability Management*, Vol. 21, No. 8, pp. 841-860
4. Brown, A., Van der Wiele, T. (1995), "Industry experience with ISO 9000", *Asia Pacific Journal of Quality Management*, Vol. 4, No 2, pp. 8-17
5. Buttle, F. (1996), "An investigation of the willingness of UK certificated firms to recommend ISO 9000", *International Journal of Quality Science*, Vol. 1, No 2, pp. 40-50
6. Camisón, C.; Cruz, T.; González, S. (2007), "Gestión de la calidad: conceptos, enfoques, modelos y sistemas", Prentice Hall, Madrid
7. Carlsson, M., Carlsson, D. (1996), "Experiences of implementing ISO 9000 in Swedish industry", *International Journal of Quality & Reliability Management*, Vol. 13, No 7, pp. 36-47
8. Casadesús, M., Alberti, M. (2003), *La innovació i la gestió de la qualitat a les empreses de Catalunya*, Col·lecció Estudis, CIDEM, Generalitat de Catalunya, Barcelona.
9. Casadesús, M., Gimenez, G. (2000), "The benefits of the implementation of the ISO 9000 standard: empirical research in 288 Spanish companies", *The TQM Magazine*, Vol. 12, No. 6, pp. 432-441
10. Casadesús, M., Karapetrovic, S. (2005A), "Has ISO 9000 Lost Some of Its Lustre: A Longitudinal Impact Study", *International Journal of Operations and Production Management*, Vol. 25, No. 6, pp. 580-596
11. Casadesús, M., Karapetrovic, S. (2005B), "The Erosion of ISO 9000 Benefits: A Temporal Study", *International Journal of Quality and Reliability Management*, Vol. 22, No. 2, pp. 120-136

12. Casadesús, M., Karapetrovic, S. (2005C), "An Empirical Study of the Benefits and Costs of ISO 9001:2000 Compared to ISO 9001/2/3: 1994", *Total Quality Management and Business Excellence*, Vol. 16, No. 1, pp. 105-120
13. CIDEM (2004), *Manual de sistemes integrats de gestió*, Centre d'Innovació i Desenvolupament Empresarial, Generalitat de Catalunya, Barcelona.
14. Corbett, C.J., Kirsch, D.A. (2001), "International diffusion of ISO 14000 certification", *Production and Operations Management*, Vol. 10, No. 3, pp. 327-342
15. Corbett, C.J.; Montes-Sancho, M.J. and Kirsch, D.A. (2005): "The Financial Impact of ISO 9000 Certification in the US: An Empirical Analysis", *Management Science*, Vol. 51, No. 7, pp. 1046-1059
16. Dee, B., Karapetrovic, S., Webb, K. (2004), "As Easy As 10001,2,3", *Quality Progress*, Vol. 36, No. 6, pp. 41-48
17. Dick, G. P. M., Heras, I., Casadesús, M.(2006), "Shedding Light on Causation between ISO 9000 and Improved Business Performance", *Academy of Management Annual Meeting*, Atlanta (USA)
18. Gotzamani, K.T., Tsiotras, G.D. (2002) "The true motives behind ISO 9000 certification. Their effect on the overall certification benefits and long term contribution towards", *International Journal of Quality & Reliability Management*, Vol. 19, No 2, pp. 151-169
19. Gunnlaugsdottir, J. (2002), "The quality must be on record: a survey of organisations having an ISO 9000 certification in Iceland", *Records Management Journal*, Vol. 12, No. 2, pp. 40-47
20. Gustafsson, R., Klefsjo, B., Berggren, E., Granfors-Wellemets, U. (2001), "Experiences from implementing ISO 9000 in small companies - a study of Swedish organisations", *TQM Magazine*, Vol. 13, No. 4, pp. 232-246
21. Heras, I., Arana, G., Casadesús, M. (2006), "The impact of quality management in European companies' performance: the case of the Spanish companies", *European Business Review*, Vol. 18, No. 2, pp. 114-131
22. Huarng, F., Horng, C., Chen., C. (1999), "A study of ISO 9000 process, motivation and performance", *Total Quality Management*, Vol. 10, No 7, pp. 1009-1025
23. ISO (2004), *The ISO survey of ISO 9000 and ISO 14000 certifications*, ISO, Geneva, Switzerland

24. Karapetrovic, S. (1999), "ISO 9000: The System Emerging from the Vicious Circle of Compliance", TQM Magazine, Vol. 11, No. 2, pp. 111-120
25. Karapetrovic, S. (2002A), "Strategies for the Integration of Management Systems and Standards", TQM Magazine, Vol. 14, No. 1, pp. 61-67
26. Karapetrovic, S. (2002B), "On the Concept of a Universal Audit of Quality and Environmental Management Systems", Corporate Social Responsibility and Environmental Management, Vol. 9, No. 3, pp. 147-156
27. Karapetrovic, S. (2003) "Musings on Integrated Management Systems", Measuring Business Excellence, Vol. 7, No. 1, pp. 4-13
28. Karapetrovic, S. (2005), "IMS in the M(E)SS with CSCS", Total Quality Management and Excellence – Menadzment Totalnim Kvalitetom i Izvrnost, Vol. 33, No. 3, pp. 19-25
29. Karapetrovic, S., Jonker, J. (2003), "Integration of Management Systems: Searching for a Recipe and Ingredients", Total Quality Management, Vol. 14, No. 4, pp. 451-459
30. Karapetrovic, S., Willborn, W. (1998A), "The Systems View for Clarification of Quality Vocabulary", International Journal of Quality and Reliability Management, Vol. 15, No. 1, pp. 99-120
31. Karapetrovic, S., Willborn, W. (1998B), "Integration of Quality and Environmental Management Systems", TQM Magazine, Vol. 10, No. 3, pp. 204-213
32. Karapetrovic, S., Willborn, W. (1998C), "Integrated Audits of Management Systems", International Journal of Quality and Reliability Management, Vol. 15, No. 7, pp. 694-711
33. Karapetrovic, S., Willborn, W. (2000), "Generic Audit of Management Systems: Fundamentals", Managerial Auditing Journal, Vol. 15, No. 6, pp. 279-294
34. Karapetrovic, S., Willborn, W. (2001A), "Audit System: Concepts and Practices", Total Quality Management, Vol. 12, No. 1, pp. 13-28
35. Karapetrovic, S., Willborn, W. (2001B), "Audit and Self-Assessment in Quality Management: Comparison and Compatibility", Managerial Auditing Journal, Vol. 16, No. 6, pp. 366-377
36. Karapetrovic, S., Willborn, W. (2002), "Self-Audit of Process Performance", International Journal of Quality and Reliability Management, Vol. 19, No. 1, pp. 24-45

37. Lee, T. Y. (1998), "The development of ISO 9000 certification and the future of quality management", *International Journal of Quality & Reliability Management*, Vol. 15, No 2, pp. 162-177
38. Litsikas, M. (1997), "Companies chose ISO certification for internal benefits", *Quality*, Vol. 36, No. 1, pp. 20-26
39. Marimon, F., Casadesús, M., Heras, I. (2006), "ISO 9000 and ISO 14000 standards: an international diffusion model", *International Journal of Operations and Production Management*, Vol. 26, No. 2, pp. 141-165
40. McAdam, R., McKeown, M. (1999), "Life after ISO 9000: An analysis of the impact of ISO 9000 and total quality management on small business in Northern Ireland", *Total Quality Management*, Vol. 10, No. 2, pp. 229-241
41. Poksinska, B., Dahlgard, J.J., Antoni, M. (2002), "The state of ISO 9000 certification: a study of Swedish organizations", *The TQM Magazine*, Vol. 14, No. 5, pp. 297-306
42. Sun, H. (1999), "Diffusion and contribution of total quality management: an empirical study in Norway", *Total Quality Management*, Vol. 10, No 6, pp. 901-914
43. Terziovski, M., Power, D., Sohal, A. (2003), "The longitudinal effects of the ISO 9000 certification process on business performance", *European Journal of Operations Research*, Vol. 146, No. 3, pp. 580-595
44. Vloeberghs, D. and Bellens, J. (1996), "Implementing the ISO 9000 Standards in Belgium", *Quality Progress*, Vol. 29, No 6, pp. 43-48
45. Wayhan, V.B., Kirche, E.T., Khumawala, B.M. (2002), "ISO 9000 certification: The financial performance implications", *Total Quality Management*, Vol. 13, No. 2, pp. 217-231
46. Whithers, B.E., Ebrahimpour, M. (1999), "Impact of ISO 9000 registration on European firms: a case analysis", *Integrated Manufacturing Systems*, Vol. 12, No. 2, pp. 139-151

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