



# ADMINISTRAÇÃO DA PRODUÇÃO

# USEFULNESS OF QUALITY MANAGEMENT SYSTEM INTERNAL AUDITS. LESSONS FROM AN EMPIRICAL STUDY

## UTILIDADE DO SISTEMA DE GERENCIAMENTO DA QUALIDADE DAS AUDITORIAS INTERNAS. LIÇÕES DE UM ESTUDO EMPÍRICO

**Arturo J. Fernández-González**

University of Vigo

**José Carlos Prado**

University of Vigo

### RESUMO

O padrão ISO 9000 tem sido considerado parte importante da implementação das auditorias internas dos QMS (Sistemas de Gerenciamento da Qualidade), de modo a gerar uma avaliação de eficiência do sistema.

Este trabalho apresenta os resultados de um serviço empírico, conduzido em empresas de Portugal e Espanha, sobre as metodologias usadas nas auditorias internas dos Sistema de Qualidade, provendo conclusões e recomendações que permitam aprimorar estes sistemas de auditoria e gestão.

### PALAVRAS-CHAVE

ISO 9000. Qualidade. Auditoria.

### ABSTRACT

*The ISO 9000 standard has been considered an important part of the implementation of internal audits from QMS (Quality Management System), to generate an assessment of efficiency of the system.*

*This paper presents the results from an empirical service, conducted in companies from Portugal and Spain, about the methodologies used at the internal audits from the Quality System, providing conclusions and recommendations that aloud to improve these auditing and management systems.*

### KEYWORDS

ISO 9000. Quality. Audit.

## INTRODUCTION

The ISO 9000 standard has always considered the obligation of implementing quality management system (QMS) internal audits, which are one of the main elements in the quality management model embodied in such regulations, oriented to self-evaluate the system efficiency, objectively and on a regular basis.

According to the ISO 19011:2002 definition, an audit is an independent, documented systematic process designed to obtain auditing tests and to evaluate them in an objective manner, in order to determine the extent to which auditing criterion are met.

The potential of internal audits as tools for continuous improvement is noted by authors such as Karapetrovic (1999), who points out that the objective of the same should be "to identify areas, processes and products that can be improved", while Russel and Regel (1996) maintain that this approach should find problems, ensure that they are understood and check that the solutions work". Sakolsky (1994) considers that process improvement can be aided by identifying weak points in the chains in the process. Mo and Chan (1997) also note that the ongoing internal auditing process of the system is certainly accompanied by a genuine commitment to establish corrective actions linked to the same, is an authentic TQM tool. Arter (1994) states that internal audits, apart from many other facets of ISO 9000, are tools for improvement.

Nevertheless, as with many other elements in quality management, errors are often made in their implementation that decisively compromise the system's efficiency. One of them is through using these audits solely as a preparation for the external auditing of certification, checking the points to be examined by the external auditors. This should not be the objective (KARAPETROVIC, 1999). Authors such as Beeler (1999), consider that internal audits do not, in themselves, provide continuous

improvement, but if they are orientated correctly, they can make a contribution. In other words, it is essential to use a suitable methodology to optimize the results of internal audits, otherwise they would become a mere procedure without contributing anything to improvement. This opinion is shared by others, such as Willborn (1990), Barthelemy and Zairi (1994) and Peters (1998).

Addey (2000), in a very interesting work, covers this issue by dismantling internal audits as tools for identifying problems and opportunities for improvement, as they are usually orientated, stating, among other considerations, that they are "retrospective", "sample based", "usually carried out by staff external to the working area" (in terms of the ISO 9000 requirement on this point); and the majority are "imposed rather than agreed and are scheduled to cover all the business" in a typical period of one year, instead of being "targeted at areas of key business risk", and restricted to ensuring compliance with the requirements, without really evaluating the quality system (pp. 681-682).

This paper presents the main results of an empirical study, conducted on companies in Spain and Portugal, dealing with the methodology used in QMS internal audits and the use, from the companies' viewpoint, of such practices. Said results, along with the commentaries of the managers responsible that were interviewed in the study, and the experience of the authors in collaboration with companies in quality management, make it possible to obtain certain conclusions and recommendations to improve the quality of the QMS internal audits and, therefore, their use for the organizations concerned.

## THE EMPIRICAL STUDY. METHODOLOGY AND MAIN FEATURES

The empirical research was developed by a team in the Organization Engineering Group (GIO) at the University of Vigo (Spain), from June 2002 to March 2003. The aim of this research was to

determine the current situation and outlook for the future in quality management implemented in companies within the Euro-region comprising Galicia (autonomous region in Northwest Spain) and the North Region of Portugal. Measuring and analysis practices applied to client satisfaction were one of the key aspects in this research.

The empirical study was conducted on a random sample of 305 ISO 9000 companies, employing 10 or more workers, belonging to the industrial and service sectors. The following conditions were imposed: the companies should have been certified before 30th June 2001, in order to guarantee a certain level of maturity of their quality management system; they should be located (at least one plant) within the territory of the Euro-Region (regardless of their nationality), and they should have autonomy in their quality management (that is to say, they should not totally depend on the directives of a person responsible or central department located outside the Euro-Region). The firms which fulfilled these conditions turned out to be 1,675 in total (1,001 in Galicia and 674 in the North of Portugal), after the

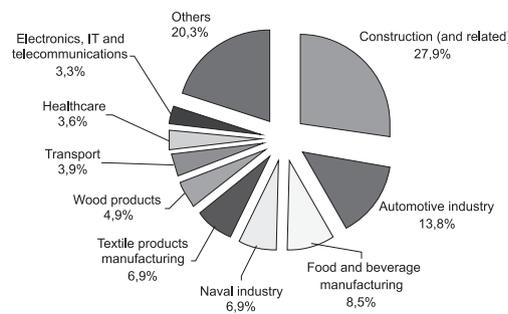
preliminary inventory carried out by the investigating team, for which different resources were consulted, such as the certifying bodies operating in the zone and other secondary sources of information.

Data was gathered by personally interviewing those responsible for quality management at the companies. The companies to be interviewed were randomly selected. The 305 companies that were finally interviewed were nearly 20% of the total, consisting of a representative sample with a 5.18% margin of error at a 95.5% confidence level and  $p=q=0.5$ .

Table 1 summarizes the basic typology of the companies interviewed. In the case of small and medium-sized companies (SMEs), we have used the European Union definition of SME. A division by sectors of economic activity is recorded in Figure 1. The companies that carry activities both productive and services, have been classified within the sector that gives the largest turnover, according to the companies interviewed. Construction companies have been included in the category of service companies.

**TABLE 1**  
**Basic typology of the sample companies**

Type	Manufacturing	Services	Total
SMEs	152	101	253
Large	35	17	52
Total	187	118	305



**FIGURE 1**  
**Sample companies classified by sector of activity**

Geographically, out of the 305 companies, 205 belong to the territory of Galicia (Spain), and 100 to the region of North of Portugal. The distribution of the companies by the standard of certification (at the time of carrying out each interview) turned out to be the following: 38 companies (12.5%) were ISO 9001:1994 certified, 59 companies (19.3%) were ISO 9001:2000 certified, and 208 companies (68.2%) were ISO 9002:1994 certified.

## RESULTS

The main results of the study, in terms of QMS internal audits in the companies studied, are presented below.

### Importance of internal audits

The average evaluation made by companies on the importance of QMS internal audits is 4.16 (on a 1-5 Likert scale), the replies being distributed as shown in Table 2. This table points to the fact that QMS internal audits are more important in the large companies, in production firms and in companies in North Portugal than in SMEs, service companies and companies in Galicia, respectively.

### Methodology used in conducting internal audits

This section looks at three basic aspects of the methodology used by organizations in conducting QMS internal audits; the characteristics of the human resources employed in them; their frequency and making the results known.

### Human resources

The human resources used by the companies for conducting QMS internal audits are in-house, in 50.5% of cases, external in 22.1% and both types in the remaining 27.4%, as shown in Table 3.

Exclusive use of in-house personnel is clearly greater in large companies, which hardly subcontract internal audits, than in the SMEs, 25.4% of which externalize them. Also, among the Spanish companies, it is notably less common (57.6%) than in the Portuguese companies, it is notably less common (57.6%) than in the Portuguese companies (36%) to use in-house personnel, the latter most combining in-house and external personnel (46.0%) as opposed to only 18.2% in Galicia). Hardly any differences are noted between production and service companies.

TABLE 2

### Importance of conducting QMS internal audits

	No. answers	Mean value
SMEs	253	4.13
Large	51	4.31
Manufacturing	187	4.22
Services	117	4.07
Galicia (Spain)	204	3.98
N. Portugal	100	4.55
Total	304	4.16

TABLE 3

### Human resources used to conduct internal audits

	No. answers	Only own resources	Only external resources	Own and external resources
SMEs	252	118 (46.8%)	64 (25.4%)	70 (27.8%)
Large	51	35 (68.6%)	3 (5.9%)	13 (25.5%)
Manufacturing	187	97 (49.7%)	41 (21.9%)	53 (28.3%)
Services	116	60 (51.7%)	26 (22.4%)	30 (25.9%)
Galicia (Spain)	203	117 (57.6%)	49 (24.1%)	37 (18.2%)
N. Portugal	100	36 (36.0%)	18 (18.0%)	46 (46.0%)
Total	303	153 (50.5%)	67 (22.1%)	83 (27.4%)

Table 4 analyzes the type of personnel used by the companies that acknowledge their use.

**TABLE 4**  
**Type of external personnel used in conducting internal audits**

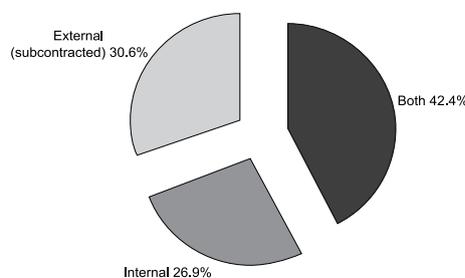
	No. answers	External consultants or professionals	Qualified personnel from other companies of the same group	Qualified personnel from other companies	Others
SMEs	111	104 (93.7%)	6 (5.4%)	5 (4.5%)	3 (2.7%)
Large	14	14 (100.0%)	2 (14.3%)	1 (7.1%)	0 (0.0%)
Manufacturing	81	76 (93.8%)	7 (8.6%)	4 (4.9%)	2 (2.5%)
Services	44	42 (95.5%)	1 (2.3%)	2 (4.5%)	1 (2.3%)
Galicia (Spain)	71	67 (94.4%)	5 (7.0%)	3 (4.2%)	1 (1.4%)
N. Portugal	54	51 (94.4%)	3 (5.6%)	3 (5.6%)	2 (3.7%)
Total	125	118 (94.4%)	8 (6.4%)	6 (4.8%)	3 (2.4%)

As shown in this table, out of the companies using external personnel to carry out internal audits, the vast majority turn to external consultants or professionals (94.5%), whereas the use of personnel from other companies in the same group (10%) or other companies<sup>1</sup> (2%) is far lower.

Continuing with the human aspect in carrying out internal audits, out of the 226 companies using in-house personnel and that provided a valid reply, personnel training for conducting internal audits was as follows: 46.0% exclusively by external courses; 13.7% exclusively by consultants

contracted for auditing and, where applicable, subsequent system maintenance, 5.8% trained in-house, 22.1% trained in both external courses and by consultants, 8.4% in external courses and internally, and the remaining 4.0% trained in other contributions of these formulas. This training included auditing practicals in the company in 80.7% of the companies concerned.

Interviewees were asked about their opinion on if QMS internal audits should be assigned to in-house or external personnel, or a combination of the two. The replies are shown in Figure 2.



**FIGURE 2**  
**Type of personnel that should carry out internal audits**

<sup>1</sup> A case to take into account is of companies hosting specialized personnel from the company itself, personnel normally belonging to an auditing service centralized in a quality department that is also centralized. In the companies studied, since the entities lacking autonomy in quality management were ruled out, this is not reflected where the company is directed by a manager or quality department outside the plant in the Euroregion. Such entities passed us on to a central department for the interview.

Figure 2 shows an important diversity of opinions since the percentage of companies inclined to in-house personnel is very similar to those that prefer to use external personnel (both in the region of 30%). This is slightly higher than

the percentage of those who consider it ideal to have a combination of both types of personnel (42.4%).

Table 5 shows these results, differentiating between types of companies.

**TABLE 5**  
**Type of personnel that should carry out internal audits**

	<b>No. answers</b>	<b>Internal</b>	<b>External</b>	<b>Both</b>
<b>SMEs</b>	<b>247</b>	<b>61 (24.7%)</b>	<b>81 (32.8%)</b>	<b>105 (42.5%)</b>
<b>Large</b>	<b>50</b>	<b>19 (38.0%)</b>	<b>10 (20.0%)</b>	<b>21 (42.0%)</b>
<b>Manufacturing</b>	<b>182</b>	<b>50 (27.5%)</b>	<b>51 (28.0%)</b>	<b>81 (44.5%)</b>
<b>Services</b>	<b>115</b>	<b>30 (26.1%)</b>	<b>40 (34.8%)</b>	<b>45 (39.1%)</b>
<b>Galicia (Spain)</b>	<b>198</b>	<b>60 (30.7%)</b>	<b>70 (35.4%)</b>	<b>68 (34.3%)</b>
<b>N. Portugal</b>	<b>99</b>	<b>20 (20.2%)</b>	<b>21 (21.2%)</b>	<b>58 (58.6%)</b>
<b>Total</b>	<b>297</b>	<b>80 (26.9%)</b>	<b>91 (30.6%)</b>	<b>126 (42.4%)</b>

The table above shows that, although the joint option is the most common in all the categories of company involved, the large concerns are more likely to use in-house personnel (38.0% as opposed to 24.7%) of the SMEs which, in their majority, opt for subcontracting this practice). Also, the Spanish companies put a greater value than the Portuguese companies on using external personnel. The companies in the North Region are mostly more convinced of counting on mixed personnel to carry out this practice.

It is clearly noted that both SMEs and large companies would rather count on in-house

personnel to a lesser extent than they do at present. In other words, the trend appears to be to externalize this activity (either totally or partially), and if this is not more widespread, it is probably due to the cost involved.

## FREQUENCY

As regards the frequency or intensity with which companies practice QMS internal audits, Table 6 shows the replies from the interviewees<sup>2</sup>. The period of reference is one year.

<sup>2</sup> It must be taken into account that some companies have given more than one opinion as an answer, so that the percentages per group may add up to more than 100.

**TABLE 6**  
**Amount of internal QMS audits conducted in the year**

	<b>No. answers</b>	<b>One complete audit</b>	<b>Two complete audits</b>	<b>Several partial audits equivalent to a complete audit</b>	<b>One or several partial audits equivalent to less than a complete one</b>	<b>Others</b>
<b>SMEs</b>	<b>251</b>	<b>139 (55.4%)</b>	<b>40 (15.9%)</b>	<b>67 (26.7%)</b>	<b>5 (2.0%)</b>	<b>24 (9.6%)</b>
<b>Large</b>	<b>50</b>	<b>24 (48.0%)</b>	<b>5 (10.0%)</b>	<b>19 (38.0%)</b>	<b>1 (2.0%)</b>	<b>6 (12.0%)</b>
<b>Manufacturing</b>	<b>184</b>	<b>99 (53.8%)</b>	<b>25 (13.6%)</b>	<b>48 (26.1%)</b>	<b>4 (2.2%)</b>	<b>22 (12.0%)</b>
<b>Services</b>	<b>117</b>	<b>64 (54.7%)</b>	<b>20 (17.1%)</b>	<b>38 (32.5%)</b>	<b>2 (1.7%)</b>	<b>8 (6.8%)</b>
<b>Galicia (Spain)</b>	<b>203</b>	<b>101 (49.8%)</b>	<b>33 (16.3%)</b>	<b>59 (29.1%)</b>	<b>2 (1.0%)</b>	<b>16 (7.9%)</b>
<b>N. Portugal</b>	<b>98</b>	<b>62 (63.3%)</b>	<b>12 (12.2%)</b>	<b>27 (27.6%)</b>	<b>4 (4.1%)</b>	<b>14 (14.3%)</b>
<b>Total</b>	<b>301</b>	<b>163 (54.2%)</b>	<b>45 (15.0%)</b>	<b>86 (28.6%)</b>	<b>6 (2.0%)</b>	<b>30 (10.0%)</b>

As can be seen from the table, the normal trend is to have a full auditing of the quality management system once a year, a practice carried out by 54.2% of the companies. The next most widely used option is to conduct several partial audits, equivalent to a full annual audit, as practiced by 28.6% of the companies. This second option is more common among the large companies (38.0%) than among the SMEs (26.7%), among which single annual audits are the most common (55.4% as opposed to the 48.0% in the large companies). This option – a single audit once a year – is also especially common in the companies in North Portugal (63.3% as opposed to 49.8% in Galicia).

When coupling these results with the opinions and comments of several interviewees in the work field, we noted a strong link between the internal audits and the audits carried out by the certifying bodies which, in most cases, carry out audits on an annual basis. Many of the interviewees provided the fact that their internal audits are carried a short time previously and in preparation for the external

audits, or to ensure satisfactory compliance with the requirements prior to being subject to them.

#### **MAKING THE RESULTS KNOWN**

As far as making the results of the internal audits known, and taking for granted that this will always be the responsibility (at least to a certain extent) of the head of quality management (either through direct intervention in the audits or as a direct interlocutor with the auditors when they are external), and the responsibility of those involved in the non-conformities detected, it was interesting in the investigation to see which other parties in the organization received information on the results of the same. Table 7 shows the results obtained.

It is noted that the management is informed of the results on the internal auditing in 69.4% of the companies (more in the production companies than in the service companies), such percentages being very close to 70% in all categories. The managerial staff is informed in 38.0% of the companies (more in the Spanish than in the Portuguese); the intermediary positions, by 21.3% and the information reaches all personnel in 16.2%.

TABLE 7

## Organization personnel informed of the results of the internal audits

	No. answers	Managing director	Managerial staff	Supervisors	All personnel
<b>SMEs</b>	<b>182</b>	<b>126 (69.2%)</b>	<b>67 (36.8%)</b>	<b>40 (22.0%)</b>	<b>29 (15.9%)</b>
<b>Large</b>	<b>34</b>	<b>24 (70.6%)</b>	<b>15 (44.1%)</b>	<b>6 (17.6%)</b>	<b>6 (17.6%)</b>
<b>Manufacturing</b>	<b>132</b>	<b>97 (73.5%)</b>	<b>53 (40.2%)</b>	<b>26 (19.7%)</b>	<b>22 (16.7%)</b>
<b>Services</b>	<b>84</b>	<b>53 (63.1%)</b>	<b>29 (34.5%)</b>	<b>20 (23.8%)</b>	<b>13 (15.5%)</b>
<b>Galicia (Spain)</b>	<b>147</b>	<b>102 (69.4%)</b>	<b>61 (41.5%)</b>	<b>32 (21.8%)</b>	<b>22 (15.0%)</b>
<b>N. Portugal</b>	<b>69</b>	<b>48 (69.6%)</b>	<b>21 (30.4%)</b>	<b>14 (20.3%)</b>	<b>13 (18.8%)</b>
<b>Total</b>	<b>216</b>	<b>150 (69.4%)</b>	<b>82 (38.0%)</b>	<b>46 (21.3%)</b>	<b>35 (16.2%)</b>

The empirical study made it possible to note, on the one hand, that 155 companies (50.8% of the total) have a formally established Quality Committee. Out of these companies, in 87.7% of cases, the Committee analyzes the results of the internal audits.

**RESULTS OF THE INTERNAL AUDITS**

The results of the internal audits in the companies are analyzed from different points of view. On the one hand, the typology of the actions arising from said audits is analyzed; on the other hand, the use that the companies make of the audits, as they are accustomed to doing. Thirdly,

an analysis is made of the extent to which the companies use these internal audits as a tool for improvement.

**TYPOLOGY OF THE ACTIONS ARISING FROM THE INTERNAL AUDITS**

One important aspect to be considered when evaluating internal audits is the typology of the actions arising from the same, as shown in Table 8.

Table 8 shows that most of the companies determine corrective actions based on the results of the auditing, relegating preventive actions to second place. So the percentage of companies that state that they establish actions that are wholly or mostly corrective rises to 76.3% of the total.

TABLE 8

## Actions arising from QMS internal audits

	No. replies	Only corrective actions	More corrective than preventive actions	Both corrective and preventive	More preventive than corrective actions	Only preventive
<b>SMEs</b>	<b>250</b>	<b>52 (20.8%)</b>	<b>135 (54.0%)</b>	<b>48 (19.2%)</b>	<b>14 (5.6%)</b>	<b>1 (0.4%)</b>
<b>Large</b>	<b>50</b>	<b>5 (10.0%)</b>	<b>37 (74.0%)</b>	<b>8 (16.0%)</b>	<b>0 (0.0%)</b>	<b>0 (0.0%)</b>
<b>Manufacturing</b>	<b>184</b>	<b>31 (16.8%)</b>	<b>118 (64.1%)</b>	<b>27 (14.7%)</b>	<b>7 (3.8%)</b>	<b>1 (0.5%)</b>
<b>Services</b>	<b>116</b>	<b>26 (22.4%)</b>	<b>54 (46.6%)</b>	<b>29 (25.0%)</b>	<b>7 (6.0%)</b>	<b>0 (0.0%)</b>
<b>Galicia (Spain)</b>	<b>202</b>	<b>49 (24.3%)</b>	<b>96 (47.5%)</b>	<b>44 (21.8%)</b>	<b>13 (6.4%)</b>	<b>0 (0.0%)</b>
<b>N. Portugal</b>	<b>98</b>	<b>8 (8.2%)</b>	<b>76 (77.6%)</b>	<b>12 (12.2%)</b>	<b>1 (1.0%)</b>	<b>1 (1.0%)</b>
<b>Total</b>	<b>300</b>	<b>57 (19.0%)</b>	<b>172 (57.3%)</b>	<b>56 (18.7%)</b>	<b>14 (4.7%)</b>	<b>1 (0.3%)</b>

This fact, which is common to all the types of company analyzed, occurs more intensely in the SMEs, in service companies and in the companies in Galicia: out of all of these, more than 20% acknowledges that internal audits only help them to establish corrective or non-preventive actions.

### USEFULNESS OF INTERNAL AUDITS

The interviewees were asked to evaluate the usefulness of the internal audits practiced in their companies. The average evaluation was 3.95, the replies being shared out as shown in Table 9.

**TABLE 9**  
**Usefulness of the QMS internal audits**

	<b>No. replies</b>	<b>Mean value</b>
<b>SMEs</b>	<b>251</b>	<b>3.90</b>
<b>Large</b>	<b>51</b>	<b>4.20</b>
<b>Manufacturing</b>	<b>186</b>	<b>3.96</b>
<b>Services</b>	<b>116</b>	<b>3.92</b>
<b>Galicia (Spain)</b>	<b>203</b>	<b>3.76</b>
<b>N. Portugal</b>	<b>99</b>	<b>4.33</b>
<b>Total</b>	<b>302</b>	<b>3.95</b>

In view of the results in Table 9, it is noted that the large companies and the companies in North Portugal obtain a greater usefulness to internal audits than the SMEs and to the companies in Galicia, respectively.

The usefulness of internal audits can be analyzed in terms of two variables of interest:

- The type of personnel used in carrying out the audit
  - The intensity involved in carrying it out
- a) Usefulness according to type of personnel*

Table 10 shows the usefulness according to the personnel carrying out the internal system

audits. These results seem to point to the use of external personnel (generally consultants), both exclusively and in combination with in-house personnel being more useful to the companies than the exclusive use of in-house personnel. To confirm this, an ANOVA test was run with the results, as shown in Table 10.

The results show that there are significant differences between the three groups under analysis ( $p=0.028$ ), although to determine exactly between which, 2 against 2 need to be subjected to the corresponding contrasts. Once this is carried out, the result is that the differences between the groups using in-house and subcontracted personnel (not mixed) are not sufficiently significant ( $p=0.111$ ). Nor are there sufficient differences between the groups using subcontracted and mixed personnel ( $p=0.487$ ), although there are between the group using solely in-house and the one using combined personnel ( $p=0.011$ ). Therefore, it may be concluded that the best solution to improve a high performance from the internal audits is the combination of in-house and external means, which gives better results than the use of in-house personnel. This result is coherent with the majority opinion of the companies, as noted earlier. The use of exclusively external personnel also gives better results than the use of exclusively in-house personnel, although there is no significant statistical difference.

*b) Usefulness according to intensity of conducting audits*

Table 11 shows the usefulness according to the intensity with which the audits are carried out.

TABLE 10

Usefulness of the QMS internal audits according to type of personnel carrying them out

	Internal audits usefulness			Levene test for equality of variances		ANOVA	
	No. replies	Mean Value	Std. dv.	F	Sig.	F	Sig.
<b>In-house personnel</b>	<b>152</b>	<b>3.80</b>	<b>1.006</b>	<b>1.280</b>	<b>0.280</b>	<b>3.617</b>	<b>0.028</b>
<b>External personnel</b>	<b>66</b>	<b>4.03</b>	<b>1.022</b>				
<b>Mixed personnel</b>	<b>83</b>	<b>4.14</b>	<b>0.952</b>				

TABLE 11

Usefulness of QMS internal audits according to the intensity of carrying them out

	No. replies	Mean value
<b>One complete audit per year</b>	<b>146</b>	<b>3.98</b>
<b>Two complete audits per year</b>	<b>45</b>	<b>4.02</b>
<b>Several partial audits per year, equivalent to one full audit</b>	<b>68</b>	<b>3.82</b>
<b>Other combinations</b>	<b>47</b>	<b>3.96</b>

These results do not permit us to draw clear cut conclusions as to which is the best frequency or intensity for carrying out internal audits, since no appreciable differences are noted in the use made by the companies in terms of the use of one or other method. Following an ANOVA test for one factor, it is confirmed that the non-existence of a significant relationship between said intensity and the use of internal audits ( $F=0.696$  and  $p=0.500$ ).

### INTERNAL AUDITS ARE TOOLS FOR IMPROVEMENT

Interviewees were enquired as to what extent the internal audits are used as a tool for improvement, i.e., as an instrument for detecting strengths, weaknesses and opportunities for improvement in quality management. The average evaluation was 4.00, meaning that the companies

find a considerable use for the internal audits as a tool for improvement in their quality management. The distribution of the replies is shown in Table 12, where it can be seen that the companies in North Portugal give a fairly higher mark than the Spanish ones, this being quite homogeneous in the other cases.

TABLE 12

Use of the QMS internal audits as a tool for improvement

	No. replies	Mean value
<b>SMEs</b>	<b>252</b>	<b>3.98</b>
<b>Large</b>	<b>51</b>	<b>4.12</b>
<b>Manufacturing</b>	<b>187</b>	<b>4.03</b>
<b>Services</b>	<b>116</b>	<b>3.97</b>
<b>Galicia (Spain)</b>	<b>203</b>	<b>3.81</b>
<b>N. Portugal</b>	<b>100</b>	<b>4.40</b>
<b>Total</b>	<b>303</b>	<b>4.00</b>

In common with the analysis of the use of internal audits, the extent to which they are used as a tool for improvement can be analyzed in terms of the type of personnel used. Table 13 shows the extent of use given by the companies according to the personnel carrying out the internal system audits.

**TABLE 13**  
**Extent to which QMS internal audits are used as a tool for internal improvement, according to type of personnel carrying them out**

	No. replies	Mean value
<b>Subcontracted personnel</b>	<b>66</b>	4.05
<b>In-house personnel</b>	<b>153</b>	3.92
<b>Mixed personnel</b>	<b>83</b>	4.11

These results appear to indicate that the use of subcontracted personnel help the companies more to interpret the internal audits as a tool for internal improvement, particularly when combined with in-house personnel. Nevertheless, on the contrary to the case of the use of internal audits explained above, in this case, the ANOVA test provides no significant differences between the average values ( $F=0.954$  and  $p=0.387$ ).

**CONCLUSIONS**

In view of the results from the empirical study, we can conclude that organizations do not make the best for themselves in conducting QMS internal audits, although it is promising to observe that the majority of the organizations lay a good deal of importance on such a practice, and that the management is involved in a high percentage of them.

One of the main weaknesses noted is the somewhat abusive use made of in-house

personnel to carry out internal audits. Approximately half of the companies carry them out solely using in-house personnel, whereas 22% subcontract them in their entirety while 27% combine in-house with external resources. We are not against the use of in-house personnel as an internal auditor, but for this to be successful, great care needs to be taken with theoretical and practical training for said staff. Our experience as collaborators with numerous certified companies tells us that, as a general rule, this is not the case and that it is normal to rely on in-house personnel, often lacking and with a superficial training. Why is this the case? Generally, to avoid extra costs for contracting consultants or specialist personnel in this type of auditing. Furthermore, on numerous occasions, especially in the SMEs, audits are entirely carried out by personnel directly linked to quality management (e.g., the quality manager), only partially complying with the requirement of independence set by the ISO 9000 standard.

The results of the study have demonstrated that the combined use of both types of audits (in-house and external) appear to be the most satisfactory option. It can be clearly appreciated that the use of internal audits is greater when carried out by a combination of subcontracted and in-house personnel (4.14) than when only with in-house staff (3.80). Certainly, the complementary factor between training in quality management, knowledge of the regulations and the methodology applied by the consultants subcontracted, on the one hand, and the knowledge of the processes and of the organization input by the internal personnel, on the other, give the best results. In an intermediate situation (4.03) lies the use of internal audits carried out with exclusively external personnel, which is better in results than that of exclusively in-house personnel and slightly worse than the combination of both (although these differences are not sufficiently significant, from the statistical viewpoint). It is interesting to note that these results confirm the opinion expressed by the

companies as to what type of personnel they would prefer to carry out internal audits.

Also, when analyzing the use of internal audits from another angle, that of its contribution to continuous improvement as a tool for improvement, it is also observed that the usefulness is greater when external personnel is used (4.05) than when in-house personnel is used (3.92), and especially when both are combined (4.11). Nonetheless, in this case, no statistically significant differences could be found between the three options.

A second relevant weakness is the excessive orientation towards corrective action as a result of the audits. The vast majority of the companies, over three quarters, adopted solely and particularly corrective actions as a result of the same. Only one company out of all those studied confirmed adopting solely preventive actions, and those adopted more corrective than preventive measures amounted to less than 5%. This points to the notion that the orientation towards more preventive rather than corrective actions is extremely limited, largely confirming the opinions of Addey (2000). This is probably due to the fact that internal audits are, in turn, excessively biased towards detecting non-compliances with the quality management system requirements, and very little towards preventing and detecting opportunities for improvement. The participation of more personnel in the auditing sessions, both internal (e.g., groups of helping or observer auditors, groups for analyzing the results, etc.) and external (e.g., consultants) may help to correct such a bias.

A further weakness, that we consider to be important, is the lack of repercussion of the auditing results on the managerial staff and intermediate posts in the organizations concerned (except on those directly affected by the non-conformities detected). Only in these companies where there is a Quality Committee, normally made up of this type of person, is there a high degree of information

on the results. Furthermore, the personnel in general is not informed of the results of the audits (this only occurs in 16% of the companies). In our opinion, the auditing results are worth being given the attention of all the departments in the organization since they reflect the general state of health of the quality management system and can help to improve its understanding and the extent to which it is implemented. Such a weakness is strongly linked with the eminently corrective nature of the actions arising from the audits, as mentioned earlier, and to the lack of participation of personnel in approaching solutions or improvements to the deviations found. The use of the results of audits as material for training personnel is also highly recommendable, both from the point of view of corrective and of preventive measures, although this is barely used in the organizations.

Conversely, no statistically justified relationship has been found between the frequency with which these audits are carried out and their use. But, in our opinion, carrying out a single internal audit each year is not the most suitable. Inevitably, the tendency is to carry it out shortly prior to the auditing conducted by the certifying body, and an annual frequency helps for it to become just a necessary procedure, which almost always leads to haste and methodological deficiencies. We consider that it is preferable to plan the internal auditing of the quality management system, breaking it up into a series of sessions throughout the year (or the auditing period chosen), each one for one of the different sectors or areas to be audited – with more regularity in those sectors with a worse level of implementation or where more deficiencies are detected, as proposed by Addey (2000) – so that the results can be analyzed, more gradually, by groups of personnel (in different stages of the hierarchy and from different areas) and contribute to solving the problems.

By way of a general conclusion, although the use of internal audits is high (3.95), in the opinion

of the companies (which demonstrates their potential to help in improvement), they can be improved upon if the weaknesses observed are gradually corrected. ➤

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### Arturo J. Fernández-González

Organization Engineering Group (GIO)  
School of Industrial Engineers  
Business Organization and Marketing Dept.  
University of Vigo  
Campus Lagoas-Marcosende, c/Maxwell s/n - 36310 Vigo  
(Pontevedra), Spain  
Tlf. (+34) 986 812 220 Fax (+34) 986 812 385  
e-mail: ajfdez@uvigo.es

### José Carlos Prado

Organization Engineering Group (GIO)  
School of Industrial Engineers  
Business Organization and Marketing Dept.  
University of Vigo  
Campus Lagoas-Marcosende, c/Maxwell s/n - 36310 Vigo  
(Pontevedra), Spain  
Tlf. (+34) 986 812 220 Fax (+34) 986 812 385  
e-mail: jcprado@uvigo.es

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