A case study of a simultaneous integration in an SME: implementation process and cost analysis

ABSTRACT

Purpose – The aim of this paper is to analyze the simultaneous implementation of an integrated management system (IMS) in a small and medium-sized enterprise (SME) and its impact on costs.

Design – Based on a case study, the paper presents and analyzes the implementation of the ISO 9001 and ISO 14001 management system (MSs) standards. The organization analyzed is an SME of the heating and air conditioning sector that had no MSs implemented (common in the sector) and decided to implement an IMS based on both function-specific MS standards and also achieving the separated certification. The analysis of expected and real costs is also presented.

Findings – The results show that a simultaneous integration is possible and the cost analysis evidences the improvement of the organization's efficiency. The certificates for both MS standards were also achieved. These findings help in confirming theoretical statement posed in the literature of the integration of MSs: integration strategy, methodology and level. The organization values this integrated implementation as very positive internally and externally, as this is one of the first organizations of the sector implementing and integrating the ISO 9001 and ISO 14001.

Originality - Although studies analyzing empirically the integration of MSs have been widely published in recent years, to the best of the authors' knowledge, this is one of the first papers analyzing the implementation of an IMS directly and analyzing its costs. In addition, this paper provides evidence that those organizations implementing integration later than others, can learn from the beginners' experience.

Keywords: management system integration, ISO 9001, ISO 14001, small and medium-sized enterprise, cost analysis.

Paper type: Research paper

1. INTRODUCTION

In recent years the studies analyzing the implementation and integration of management systems (MSs) have increased (see e.g., Douglas and Glen, 2000; Karapetrovic et al., 2006; Salomone, 2008; Bernardo, 2014; Domingues et al., 2015; Bernardo et al., 2017). This is mainly because of the success in the implementation and certification of the quality MS ISO 9001 and the environmental MS ISO 14001. According to the last available data (ISO, 2016), the growth rate of certifications for ISO 9001 has decreased 0.2% and for ISO 14001 has maintained an 8% as in the previous year (ISO, 2016).

As discussed in previous studies, organizations can have multiple function-specific MSs implemented and it is necessary to define the best strategy to manage all them in the most efficient way (Beckmerhagen et al., 2003; Bernardo et al., 2009). This strategy is proven to be the integration of these MSs into a single and more effective and efficient MS, the integrated MS (IMS), that aims to satisfy all the organization's stakeholders (Karapetrovic and Willborn, 1998a; Beckmerhagen et al., 2003).

The existing literature about the process of MSs integration is wide, analyzing mainly the aspects of the process (Douglas and Glen, 2000; Salomone, 2008; Bernardo et al., 2009; Gianni and Gotzamani, 2015; Gianni et al., 2017). General consensus has been achieved for all the process aspects except in one: the integration methodology. There is not a common and widely applied methodology or model that the organizations can follow in order to ensure a successful process and several possibilities have been proposed (AENOR, 2005; Karapetrovic, 2005; de Oliveira, 2013), and no international certifiable standards have been published proposing a guideline. This aspect is also related to the sequence in which these MSs have been implemented (sequential or simultaneous) which can condition the integration methodology applied and both aspects can also condition the integration level (Bernardo et al., 2012a). There is scarce literature relating these three aspects of the process empirically (the majority of relationships are between two aspects, e.g., Labodová, 2004; Bernardo et al., 2012a). Thus, taking in to account these results, the aim of this paper is to analyze the simultaneous implementation of an integrated management system in a small and medium-sized enterprise (SME). The costs of this implementation would also be analyzed.

The contribution of this paper is to be one of the first empirical studies demonstrating that implementing an IMS is possible (different from the implementation of the two MSs at the same time), also in an SME, and it is profitable for the organization in terms of efficiency gained.

2. LITERATURE REVIEW

This section is divided into three subsections. First, the different aspects of the integration process are analyzed. Second, the existing studies of IMS in SMEs are reviewed and finally, the cost analysis in IMS.

2.1. Integration process

The MSs integration process has been widely analyzed in the literature. It is accepted that the main aspects of the integration process are (Bernardo et al., 2012a; Almeida et al., 2014; Domingues et al., 2015): strategy, methodology, level, internal and external audits and benefits and difficulties. All they are described below.

The *integration strategy* refers to the sequence that the organization has followed to implement the multiple MSs. The most cited and applied strategies were defined in Karapetrovic and Willborn (1998a), who proposed three possibilities considering the implementation of two MSs which is to establish: (a) first the quality MS (QMS) and then the environmental MS (EMS), (b) first the EMS and then the QMS, and (c) both MSs simultaneously. Empirical studies show that the most followed is the first strategy (see e.g., Douglas and Glen, 2000; Santos et al., 2011) and the second is applied, normally, for sector demands (e.g., Bernardo et al., 2016). The third possibility, i.e., implementing both MSs at the same time, is the least applied but it was found to be the one leading to a higher integration level (Bernardo et al., 2012a). Lavodová (2004) also proposed two different strategies considering quality, environment and health and safety MSs: (a) 'step-by-step', in which the MSs are implemented sequentially and then integrated (found the most common), and (b) simultaneous implementation, in which the MSs are implemented integratedly (scarcely analyzed).

Regarding the *integration methodology*, several proposals have been published and thus, no consensus has been met in this aspect of the process. It refers to the model or tools used to integrate. There are two different sources of methodologies: normalization bodies and the academia. Guidelines have been proposed by normalization bodies, such as AENOR (2005) and BSI (2012). Although an international and certifiable MS standard (MSS) does not exist, it does at the national level and ISO published a manual in which some tips to integrate are presented (ISO, 2008). To summarize them, the majority of guidelines proposes to start integrating the common elements and then continue with those more function-specific. Regarding the academia proposals, several can also be found. For example, Karapetrovic (2005) proposed three different models: (a) 'initial', in which the IMS model is one of the MSs models; (b) 'combined', in which the IMS model is a combination of all MSs models, and (c) 'complacent', in which the IMS model is created in order to

accept the different models of all MSs integrated. Karapetrovic et al. (2006) proposed four main tools: (a) process map, as the IMS model could be the same as the ISO 9001 model; (b) PDCA model, as the IMS model could be the same of the ISO 14001 model; (c) common elements, which refers to first integrate the common elements of all the MSs and then the function-specific elements, and (d) an own model, which refers to the creation of an own model that best fits within each organization. de Oliveira (2013) proposed the integration in three main stages: (a) 'planning', in which elements such as external consulting, study of interrelations among standards and integration team and plan are considered; (b) 'development', in which elements such as human resources, documentation and communication and customers are considered, and (c) 'control and improvement', in which elements such as customers' perception of IMS key elements, audits and improvement of IMS are considered. Rebelo et al. (2014) proposed a model to improve the competitiveness and added value of the organizations in which several MSs could be integrated. Finally, the support of information technologies in the process has also been positively highlighted (Pho and Tambo, 2014).

The *integration level* refers to the degree of integration achieved in the process, i.e., the level of integration of the IMS. Although several degrees have been defined (see e.g., Karapetrovic et al., 2006; Salomone, 2008; Bernardo et al., 2009), the most used are three (Karapetrovic, 2002): (a) not integrated, meaning that MSs are managed as separate systems; (b) partially integrated, meaning that some elements of the MSs are managed as a single system and the rest of elements are managed separately, and (c) fully integrated, meaning that all the elements of the MSs are managed as a single MS. Empirical studies evidence that the great majority of organizations tend to fully integrate their MSs (Bernardo et al., 2009; Abad et al., 2014).

Another important aspect of the integration process is the *integration level of audits* both internal and external (Karapetrovic and Willborn, 1998b; Kraus and Grosskopft, 2008). This aspect has been analyzed (Karapetrovic et al., 2006) considering the auditors' team, if it is the same for all norms or different depending on the MS; the audit time, if the audits are performed simultaneously or at different moments of time; the audit plan and report, if they are the same for all MSs or different for each of them; and the opportunities to improve, if they are for the IMS or for each MS. The studies show that in the great majority of organizations, the integration level of internal audits is higher than the externals (Bernardo et al., 2010, 2011; Simon et al., 2011, 2014), as the latter are not controlled or do not depend on the organization's will as the former do.

The last aspect mainly analyzed for the integration of MSs process are the *benefits and difficulties*. Conceptual and empirical studies allow summarizing as the main benefit the improvement of

organization's efficiency (Zeng et al., 2011; Bernardo et al., 2015); while the main difficulties are related to the lack of resources (Zeng et al., 2007; Gianni and Gotzamani, 2015).

Once the process of implementation has finished, other aspects have been analyzed, such as the experience managing the IMS (Bernardo et al., 2013) and the comparison among countries (Simon and Douglas, 2013; Bernardo et al., 2017). Also, it has been also related to other practices such as customer satisfaction (Simon and Pentji Yaya, 2012), innovation performance (Hernandez-Vivanco et al., 2016) and organizations' performance (de Oliveira, 2013; González Pedraza and Lambán Castillo, 2014; Ferrón Vílchez and Darnall, 2016). The organization's size has also been discussed as a conditioning factor for the integration because the small and medium-sized enterprises are more flexible than large, although the latter have more resources available (Karapetrovic, 2003; de Oliveira, 2013).

2.2. IMS and SMES

Small and medium-sized companies are very important in most economies. For example, in Spain, and as well in the European Union, SMEs account for more than 99% of all businesses, and employ around 67% of the private sector work force (DIRCE, 2016).

SMEs have several barriers to adopt MSs such as cost, lack of expertise or non-inclusion in firm's strategy (Chan, 2011). Also, Revell and Blackburn (2007) realized that the initial investments of implementing a MS could be outweigh than estimated economic benefits.

Moreover, SMEs could contribute around 70% of the global environmental pollution (Burke and Gaughran, 2007). However, research related to the environmental management is more oriented to large corporations than SMEs (e.g., Moore and Spence, 2006; Brammer and Pavelin, 2006; Masurel, 2007; Brammer et al., 2012). In addition, large firms are more engage with environmental issues than SMEs (Brammer et al., 2012). For that reason, alternative models for environmental management have major advantages for SMEs than EMAS and ISO 14001 certifications (Wenk, 2006; Heras and Arana, 2010).

As a result of the complexity of implementing IMSs related to personal skills and administrative process, SMEs prefer to implement individual MSs, while large companies regularly integrated them (Duijm et al., 2008). However, the integration in SMEs occurs naturally and under the supervision of a single person, which could have problems to identify priorities (Duijm et al., 2008; Santos et al., 2011). Douglas and Glen (2000) observed that SMEs adopted first QMS and then EMS, but is the same strategy that follows all size companies, because QMS have a direct impact on market success like corporate image, as well as, customer and employee satisfaction (Llach et

al., 2013). Additionally, Llach et al. (2013) observed that environmental practices are significantly impacted by quality practices, and the first ones, have a direct influence on profitability.

2.3. IMS and cost analysis

Some studies have analyzed the relationship between some MS certifications with the financial performance, although the results are divers.

One the one hand, some authors found a positive relationship. For example, QMS increase the quality of the company and improve operational efficiencies; consequently, it is translated into a decrease of costs based on waste and production cost reduction, thus increasing the financial performance (e.g., Garvin, 1984; Deming, 1986; Corbett et al., 2005; Corredor and Goñi, 2011; Zhang and Xia, 2013). But the positive relationship could be because the QMSs increase sales, and that means increasing the profits through cost reductions and income rises (e.g. Corbett et al., 2005; Kafetzopoulos and Gotzamani, 2014). The implementation of EMSs could increase sales, based on the environmental awareness of the customers, and cost reduction due to the productivity and efficiency improvements (Nishitani, 2011).

On the other hand, some researchers have found no relationship between financial performance and MSs. QMS adoption is not associated into financial performance benefits (e.g., Terziovski et al., 1997; Martínez-Costa et al., 2008). Other authors observed that EMS could increase production cost to applied environmental investments to reduce pollution, energy consumption or use renewable energy. The result is to increase prices or it could affect negatively to the financial performance (Klasser and Whybark, 1999; Albertini, 2013).

Other authors observed a positive relationship between the company which integrated several MS and the financial performance, related to the opportunity to reduce time and other costs associated to the IMSs implantation like bureaucracy costs (Castka and Corbett, 2015; Ferron Vilchez and Darnall, 2016; Martí-Ballester and Simon, 2017).

Considering the abovementioned, the majority of existing literature analyzed the simultaneous implementation of multiple MSs that were integrated afterwards but only Labodová (2004) proposed the simultaneous integration or the implementation of the IMS. Thus, this paper pretends to fill this gap presenting an empirical case of an organization that has implemented an IMS to further analyze the related costs of the process and provide new evidences of the impact of IMS on performance.

3. RESEARCH METODOLOGHY

In order to achieve the research objective a case study of a single organization was done. The organization analyzed is a family business with 10 employees. Its activities are related to the construction sector, specifically of heating and air conditioning. It is located in Mollet del Vallès, in Barcelona (north of Spain).

It has more than 800 clients that can be classified into 5 main types: public administration, construction companies, engineering, neighborhood associations and other institutions such as hospitality or religious organizations. The organization had no MSs implemented before and decided to implement an IMS based on both function-specific management system standards and also achieving the certificate for each one. The motivation to implement the IMS is both internal and external. The former is based on the organizational culture, as it implements the continuous improvement and also has environmental concern; the involvement of the top management is very high. The latter is because the organization wants to be able to adapt to a dynamic environment and also because of the competitive advantage that this practice can provide.

For the case, the manager and the consultant provided information about the decision-making and the implementation and certification processes. This organization was selected because in this sector in this geographic area, organizations are not certified of these MSSs and thus, it was an extreme or deviant case (Creswell, 2013), becoming the first organization in certifying and integrating.

To apply the case study methodology, direct observation of the implementation process and documentation analysis was done and then, in order to reinforce the case, two brief interviews were also realized to gather top management's and external consultant's opinion (Yin, 2009). Because of the relationship of one author with the organization, a detailed implementation process can be presented. Regarding the questions of the interview, they were focused on gathering the importance of the implementation of the IMS, the impact of this implementation within the organization, the level of satisfaction the interviewees had regarding the result achieved and their forecasted proposal for future maintenance of the IMS.

The implementation started in July 2014 and finished in April 2015. All the documentation and observation were analyzed by the authors simultaneously during the implementation and certification processes. This case is mainly based on content analysis and the interviews reinforce the statements found. The research protocol followed is presented in figure 1 (following Yin, 2009; Heras-Saizarbitoria and Boiral, 2015).

Although analyzing a single case could be a limitation (see also Shah, 2011; Dobele et al., 2014; Shapiro and Naughton, 2015; Richter and Arndt, 2016; Gianni et al., 2017), knowing in depth the implementation and certification of the MSs could only be done in one organization.

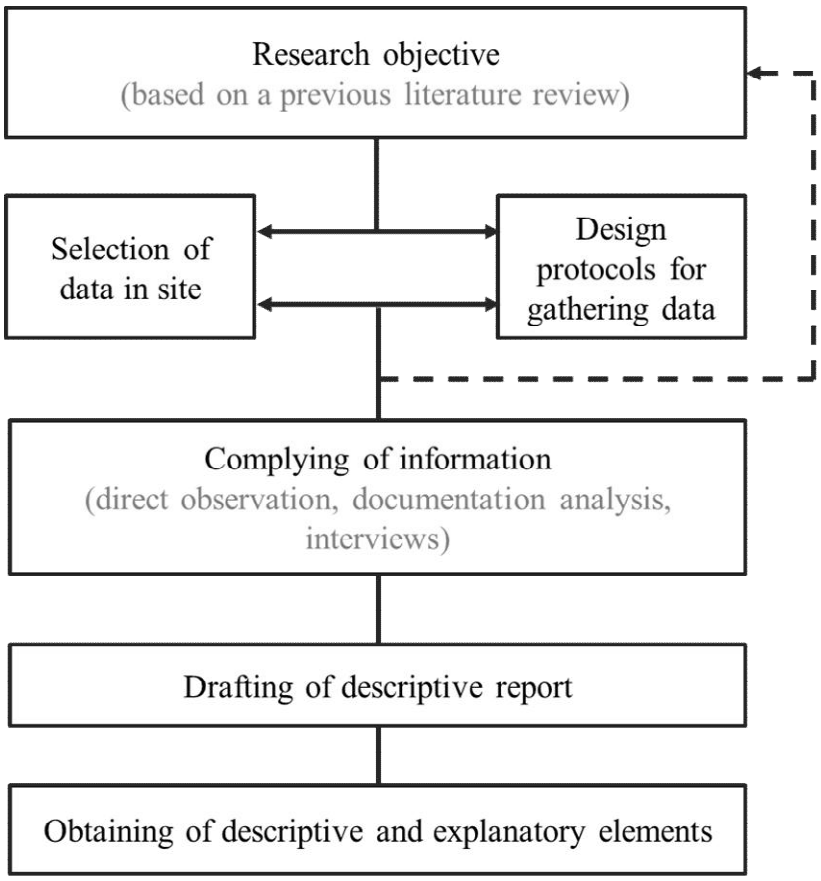

Figure 1 – Research protocol

Source: adapted from Heras-Saizarbitoria and Boiral (2015)

4. RESULTS

In this section, the implementation of the IMS is presented first, then its cost analysis and finally, the interviews with the manager and the consultant.

4.1. Implementation process

The implementation of both standards, ISO 9001 and ISO 14001 was decided to be integrated although the certification was done individually. To implement these two MSSs a consultant was hired. The consultant studied and analyzed the internal processes by performing interviews with top management and employees, which resulted in a selection of IMS indicators according to the

different areas, included the organizational chart (e.g., Technical, Logistics, Human Resources, Environment), for example:

a) Regarding labor costs (technical), an indicator that measures an average deviation in terms of days working in each installation, in order to control to which extent expected labor costs are well predicted.
b) Regarding Human Resources, an annual average ratio of absenteeism.

In terms of environment, an indicator which measures the average fuel consumption per workday including all company vehicles needed for works, visits and other needs.
In the initial meeting with her, she proposed to implement the IMS rather than the two MSSs separately and the organization accepted the proposal.

The implementation process started on July 2014 and ended in April 2015. The process was divided into 8 phases that are shown, together with the time required in each one, in figure 2:

- First stage: beginning of implementation

In the first stage, a working team was created. It was made up with two people: the purchasing and logistics manager, and the human resources manager.

During July, the external consultant had meetings with the top management and created the process map. As a result of this, the requirement 7.3 of design and development of the ISO 9001 was excluded because the technical manager adapts the design to each customer. In addition, the documentation was created and consisted on the quality and environment manual, the quality and environment policy, procedures, working instructions and records.

Another decision made in this stage was that all the implementation was going to be managed electronically because of productivity and sustainability.

- Second stage: first meeting for management review

In the meeting both the indicators and the additional aims of the IMS were set. The external consultant took also part on this meeting.

- Third stage: implementation

In this stage the signaling and evaluation of indicators was done. A calibrating evaluation was also required. For confidential reasons of both the organization and the consultant, more information on this stage cannot be provided.

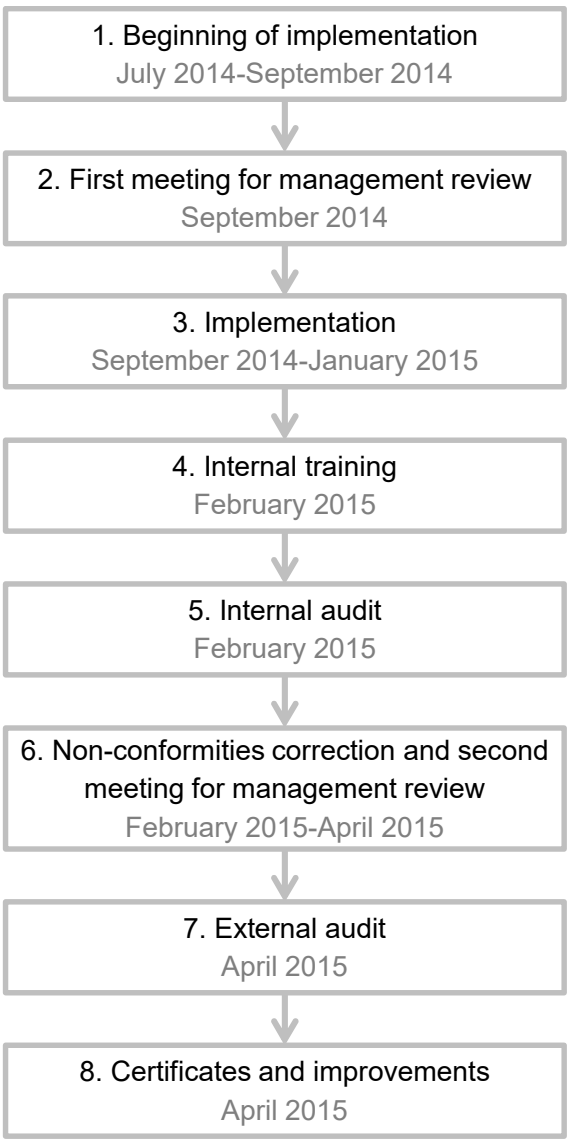

Figure 2 – Implementation process

- Fourth stage: internal training

Two internal meetings were done. One was to present and give the welcome manual to all the members of the organization, and the other was to train the employees in the health and safety emergency plan.

- Fifth stage: internal audit

The external consultant performed this stage. The first internal audit in February 2015 lasted two days and 4 non-conformities were detected, which were corrected before the external audit. Nevertheless, 5 strengths were also written in the audit report: personnel participation during the integrated implementation, company indicators, order and cleaning of the warehouse, appropriate management program with accurate quality quotations and accreditations.

- Sixth stage: non-conformities correction and second meeting for management review

Corrective actions were applied to amend the 4 non-conformities. The comments reported for improvement were considered in the second meeting for management review.

- Seventh stage: external audit

This audit was done in two stages. The first was the meeting to plan the audit in which a brief review of part of the documentation was done and improvement actions were reported. Also, the audit day was determined. In the second stage the external auditor reviewed all the documentation and visited a maintenance site.

The first external audit was carried out in April 2015, lasted three days and none non-conformities were detected. Hence, the company successfully passed the audit with only five improvement opportunities and three findings detected. All these aspects were improved before April 2016 and did not imply additional expenses. Furthermore, the report included different strengths (e.g., personnel commitment, suppliers' assessment indicator), which meant an achievement according to the top management.

- Eight stage: certificates and improvements

In this last stage the certificates application was done. The organization was committed to continue improving the IMS.

The second internal audit in March and April 2016 lasted two days and one non-conformity was detected, which was also corrected before the following external audit. However, 5 strengths were also written in the audit report: personnel commitment, company indicators, order and cleanliness in the warehouse, and continuous improvement with preventive actions and environmental awareness among personnel. The second external audit undertaken in April 2016 lasted one day and one non-conformity was detected due to the fact that a new version of an environmental law was not recorded in the Excel file "7.8-01 Legal Compliance". The non-conformity was corrected in May and, therefore, the company passed the external audit without any additional expenses. In addition, the report included different strengths (e.g., quality of the written content included in the reports of top management meetings, order and cleanliness in the warehouse). In addition, both MSSs will be adapted in the last semester of 2017, before performing the renewal certification audit in April 2018.

4.2. Cost analysis

Once the implementation and certification finished, the organization analyzed the costs of the IMS. They are presented in relative numbers as the organization wanted to keep this information anonymous. Table 1 presents the costs of implementation.

The company analyzed the costs by following the distinction stated by Rocafort Nicolau and Ferrer Grau (2010): external (expenses which come from outside the organization or are communicated by financial accounting) and internal (cost accounting).

Top management considered that analyzing the costs of a process such as the implementation of both standards (ISO 9001 and ISO 14001) is key because the company needs to control profitability in each decision-making process. Otherwise, the organization would not survive in the long run. As a family business, owners from the company under study are based on a long-term view and care about family succession. Therefore, expenses and resources management is done in a conservative way. Overall, investments are financed with internal resources (equity).

Table 1 – Cost analysis of the implementation

	QMS	**EMS**	**2015**	**2016**	**2017**
Expected external costs					
External audit	X	X	0	19.19	19.19
Consultant services	X	X	0	8.20	8.20
Waste annual fee		X	0	3.54	3.54
Other costs	X	X	2.36	2.95	2.95
Expected internal costs					
Working hours QE responsible 1	X	X	30.95	15.74	15.74
Working hours QE responsible 2	X	X	15.79	10.67	10.67
Working hours general manager	X	X	28.10	17.63	17.63
Working hours technical manager	X	X	15.52	12.83	12.83
Working hours logistics manager	X	X	4.29	5.31	5.31
Other costs	X	X	3	3.94	3.94
Total			**100**	**100**	**100**

Source: the company

The activities that generate cost beyond expected were basically external: calibration and engineering services. Engineering services and calibration were unexpected and, hence, the real costs were significantly higher.

Regarding the deviation, working hours were lower than expected in monetary terms except for internal waste management. Although QE responsible 1 activities associated with recording different documentation, planning and corrections suggested during audits were significant; they were lower than expected in monetary terms.

Table 2 provides the real costs incurred and allows the comparison among costs. Observing the real costs (proportion of costs in euros), no waste annual fee is included because this expense is incurred every five years with the renewal of the contract with an external waste manager. Other costs are related to preventive actions such as the purchase of sepiolite with the goal of absorbing spilled liquids in case of any accident.

Table 2. Real costs analysis comparison and forecast

	QMS	EMS	2015	2016	2017
Real external costs					
External audit	X	X	0	24.07	-
Consultant services	X	X	0	10.28	-
Waste annual fee		X	0	0	-
Other costs	X	X	0.48	1.97	-
Real internal costs					
Working hours QE responsible 1	X	X	38.31	29.62	-
Working hours QE responsible 2	X	X	15.87	10.91	-
Working hours general manager	X	X	25.43	13.11	-
Working hours technical manager	X	X	15.60	8.04	-
Working hours logistics manager	X	X	4.31	2	-
Other costs	X	X	0	0	-
Total			**100**	**100**	**-**

Source: the company

Real internal costs are only represented by human labor costs which include salaries plus social security charges. The major proportion of working hours is allocated to QE responsible 1 (twice of what was expected in 2016). This person takes charge of the major issues related to both management systems, such as the organization and the recording of top management meetings in a written document. However, QE responsible 2 is the expert person in some indicators with the participation of the technical manager. The logistics manager assists the QE responsible 1 in some issues (e.g., control of personal protection equipment and tools provided to technicians that install, repair and maintain heating and air conditioning systems and units). From table 2, it could be stated that the major reduction of costs is internally driven, thus, the organization become more efficient with the internalization of the IMS.

Since both certifications were achieved, the company has reached, due to brand image linked with the previous successful goal, three new important clients from the industry (among others) that value the possession of ISO 9001 and ISO 14001 international and voluntary standards. However, top management points out that there is not enough evidence to confirm or deny if there is a correlation between the increase in net profit and the implementation of the IMS. Nonetheless, the total annual net profits in 2015 and 2016 are higher than implementation and maintenance's costs, respectively. No more cost analysis can be undertaken due to confidentiality reasons.

4.3. Participants' opinion

It was also important to gather the opinion of the main characters of the process: the manager and the external consultant. These opinions reinforce the results achieved regarding the implementation process and cost analysis performed, as a complementary source of information.

For the manager, the IMS is considered as an investment that "*allowed improving some organizational aspects, highlighting the documentation and easing the internal management*". The positive value is also for the "*commitment and implication of all the members of the organization*". Quality has been easily applied because of the way of working that the organization had but the environment management was new. Thus, "*the implementation and certification of the ISO 14001 has been important for the organization*". Specifically, top management considered the following achievements as the most important in relation with the integrated implementation:

(1) Quality:

- Coding of documents (e.g., IMP 7.7-01), enhancing content and design (attractive, simpler and useful).
- New indicators to assess the quality of the service (e.g., registration of compliments and claims from customers).

(2) Environment:

- Adequate control of waste.
- Ecological policy.
- Efficient recycling process.
- People inside the organization become more environmentally-aware and energy-saving.

(3) Quality and environment:

- Company's public image and reputation.
- Continuous improvement regarding control and decision-making processes.
- Explaining the internal processes in a written formal document with new know-how from the consultant, which can facilitate the new employees' understanding of the organization.
- Preventive actions.
- Synergies with stakeholders (e.g., facilitating improvements with an external service in terms of safety measures).

The external consultant's opinion can be defined into 6 main strengths:

- *"The commitment and implication with the IMS of all employees"*
- *"The effort done"*
- *"Employees' training"*

- *"Warehouse management"*
- *"Budget planning according to the working operations"*
- *"Internal program control, accreditations and legal compliance"*

Thus, the consultant was "*very satisfied with all the work done and the behavior of the employees*". She forecasted that the working team has knowledge enough to internalize the IMS.

5. CONCLUSIONS

The aim of this paper was to analyze the simultaneous implementation of an integrated management system in a small and medium-sized enterprise, together with the analysis of the costs incurred. The single case study presented allows posing the following conclusions, although they should be taken with caution because a single case was realized.

First, the results show that a simultaneous integration is possible (as proposed by Labodová, 2004), and more effective and efficient than implementing the management system standards sequentially. The organization decided to implement directly the IMS mainly for internal motivations and also because the experience of the external consultant helped them to learn from previous practices, implementing both MSs, ISO 9001 and ISO 14001, at the same time and as a single system (see e.g., Douglas and Glen, 2000; Llach et al., 2013).

In terms of the integration of MSs process, the sequence of implementing these two MSs could be considered as more than simultaneous, because it was integrated or implementing the IMS directly. This is one of the main contributions of this study because previous proposals, such as Karapetrovic and Wilborn (1998a), proposed the implementation of MSs individually, even the simultaneous proposal was considering the implementation of both MSs at the same time, but not integratedly (see e.g., Douglas and Glen, 2000; Karapetrovic et al., 2006; Salomone, 2008; Bernardo et al., 2009; Abad et al., 2014). In this paper, although it is only a case, it is proved that an IMS could be implemented and thus, adding a new option of implementation sequence. Labodová (2004) also proposed this type of implementation as an option and with the case presented in this paper, an evidence of this implementation has been provided.

For the rest of the aspects analyzed in the integration process, the methodology used is based on common elements analysis (e.g., Karapetrovic et al., 2006; Bernardo et al., 2016, 2017). Regarding this aspect, it could be stated that the organization applied a 'combined' model in terms of Karapetrovic (2005)'s proposal, and according to the stages defined, the organization followed the methodology proposed in de Oliveira (2013), i.e., 'planning-development-control and improvement'. In terms of the level of the IMS, it is the highest as all the elements are managed as a

single MS. The integrated implementation allowed the organization to achieve high levels of integration as concluded in Bernardo et al. (2012a).

The auditing processes were also analyzed and found that the integrated audits required a few days to be performed and could be easily done when auditors are trained (e.g., Bernardo et al., 2010, 2011; Simon et al., 2011).

Thus, it could be stated that this organization has implemented a single MS and its process of implementation could be compared with other processes done in organizations implementing one MS, for example, the ISO 9001 or the ISO 14001, although achieving greater benefits (Bernardo et al., 2015). These results evidence that the lessons learned help in improving and enhancing the implementation of IMS, making it a dynamic and adaptive process worthy to apply within organizations.

It could also be said that the IMS is more effective and efficient because the organization is one of the first in the sector in which it operates to implement and certify these MSs, taking advantage of being the leaders in this case. However, on the other side, implementing these MSs at this moment, when a great amount of organizations have both MSs certified worldwide, make them to also take profit of being the laggards and learning from best previous practices (Bernardo et a., 2015), such as using information technologies to manage the IMS (Pho and Tambo, 2014). Empirically, this efficiency is measured on the cost analysis that demonstrates the low cost are needed to implement and maintain the IMS (Castka and Corbett, 2015; Ferron Vilchez and Darnall, 2016; Martínez-Ballester and Simon, 2017). Also, according to the results, it could be stated that the major reduction of costs is internally driven, thus, the organization become more efficient with the internalization of the IMS. This is the second contribution of this research, as it has evidenced the improvement of the efficiency of the IMS implementation.

Regarding the organization's size, being a small company owned and in which two generations of the same family are working allows saying that the size could enhance the integration process (in contrast with Duijm et al., 2008; Santos et al., 2011 and similar to Karapetrovic, 2003; de Oliveira, 2013). In fact, the employees' commitment becomes more important than the resources availability, as the former has been highlighted as an important factor to succeed and the latter has not been mentioned (e.g., Zeng et al., 2007). Thus, it could be stated as the third contribution of this paper, that SME as large companies, can integrate their MSs or implement IMS.

Related to this, an internal and an external person of the organization have valued the process. In both cases the opinion is very positive ensuring the continuous improvement of the IMS (Heras-Saizarbitoria and Boiral, 2015; Bernardo et al., 2017).

Thus, managers of those organizations not integrating their MSs or those not fully integrating them, have evidence that this could be done and it is worthy to be done. Simultaneous integration needs certain behaviors and actions to be taken to be successful. Thus, managers should be involved and make the rest of the employees involved too, they should motivate their employees and implicate them in the process, they should guarantee that necessary resources are available and should provide training in order to ensure an appropriate application and improvement of the IMS (Karapetrovic et al., 2006; Bernardo et al., 2016). If not, the integration could fail and be considered as a cost and not as a benefit as it should (Gianni and Gotzamani, 2015).

Also, it evidences that implementing an IMS is an efficient practice. In this process, the only aspect that could be valued as less positive is the need to certify both MSSs separately. It is not clear if an international certifiable MSS to integrate would lead to an increase in the number of organizations integrating their MSs. ISO has, at least, implemented the High Level Structure in all its new and updated MSSs in order to enhance their integration (Bernardo et al., 2016). The diffusion of this practice could make improve the country's global efficiency which could be the main governmental implication and thus, promoting the integration of MSs providing different sources of funding (Bernardo et al., 2016). The evolution of this simultaneous integration could open new research lines for the academia.

Finally, the main limitations of this study are the sample size, as only one organization has been analyzed (extreme case following Creswell, 2013), and the location, as the organization is Spanish and this country has been ranked in the top 5 countries in ISO 9001 and ISO 14001 for a long time (ISO, 2016). Comparing this case to other organizations integrating their MSs could be done in future research as well as analyzing them in different countries to detect similarities (as in Simon and Douglas, 2013; Bernardo et al., 2017). An additional future research proposal would be to analyze the integration process form the resource based view (RBV) perspective as it provides competitive advantage to the implementing organizations.

REFERENCES

Abad, J., Dalmau, I. and Vilajosana, J. (2014), "Taxonomic proposal for integration levels of management systems based on empirical evidence and derived corporate benefits", J*ournal of Cleaner Production*, Vol. 78 September, pp. 164-173.

Albertini, E. (2013), "Does environmental management improve financial performance? A meta-analytical review", *Organization & Environment*, Vol. 26 No. 4, pp. 431-457.

AENOR (2005), *UNE 66177 Sistemas de gestión. Guía para la integración de los sistemas de gestión,* Asociación Española de Normalización y Certificación, Madrid, Spain.

Almeida, J., Domingues, P. and Sampaio, P. (2014), "Different perspectives on management systems integration", *Total Quality Management & Business Excellence*, Vol. 25 No. 3-4, pp. 338-351.

Beckmerhagen, I., Berg, H., Karapetrovic, S. and Willborn, W. (2003), "Integration of management systems: focus on safety in the nuclear industry", *International Journal of Quality & Reliability Management*, Vol. 20 No. 2, pp. 210-228.

Bernardo, M., Casadesus, M., Karapetrovic, S. and Heras, I. (2009), "How integrated are environmental, quality and other standardized management systems? An empirical study", *Journal of Cleaner Production*, Vol. 17 No. 8, pp. 742-750.

Bernardo, M., Casadesus, M., Karapetrovic, S. and Heras, I. (2010), "An empirical study on the integration of management system audits", *Journal of Cleaner Production*, Vol. 18 No. 5, pp. 486-495.

Bernardo, M., Casadesús, M., Karapetrovic, S. and Heras, I. (2011), "Relationships between the integration of audits and management systems: An empirical study", *Total Quality Management*, Vol. 23 No. 6, pp. 659-672.

Bernardo, M., Casadesús, M., Karapetrovic, S. and Heras, I. (2012a), "Integration of standardized management systems: Does the implementation order matter?", *International Journal of Operations & Production Management*, Vol. 32 No. 3, pp. 291-307.

Bernardo, M., Casadesus, M., Karapetrovic, S. and Heras, I. (2012b), "Do integration difficulties influence management system integration levels?", *Journal of Cleaner Production*, Vol. 21 No. 1, pp. 23-33.

Bernardo, M., Gotzamani, K. and Gianni, M. (2013), "Certification maturity as a diffusion factor for management systems integration", paper presented at EUROMA Conference, June 2013, Dublin, Ireland.

Bernardo, M. (2014), "Integration of management systems as an innovation: a proposal for a new model", *Journal of Cleaner Production*, Vol. 82 November, pp. 132-142.

Bernardo, M., Simon, A., Tarí, J.J. and Molina-Azorín, J.F. (2015), "Benefits of management systems integration: a literature review", *Journal of Cleaner Production*, Vol. 94 May, pp. 260-267.

Bernardo, M., Gotzamani, K., Vouzas, F. and Casadesuús, M. (2016), "A qualitative study on integrated management systems in a non-leading country in certifications", *Total Quality Management and Business Excellence*, doi: http://dx.doi.org/10.1080/14783363.2016.1212652

Bernardo, M., Gianni, M., Gotzamani, K. and Simon, A. (2017),"Is there a common pattern to integrate multiple management systems? A comparative analysis between organizations in Greece and Spain", *Journal of Cleaner Production*, Vol. 151 May, pp. 121-133.

Brammer, S., Hoejmose, S. and Marchant, K. (2012), "Environmental management in SMEs in the UK: practices, pressures and perceived benefits", *Business Strategy and the Environment*, Vol. 21 No. 7, pp. 423-434.

Brammer, S. and Pavelin, S. (2006), "Voluntary environmental disclosures by large UK companies", *Journal of Business Finance & Accounting*, Vol. 33 No. 7–8, pp. 1168–1188.

BSI (2012), *PAS 99 Specification of common management system requirements as a framework for integration*, British Standards Institution, London, UK

Burke, S. and Gaughran, W.F. (2007), "Developing a framework for sustainability management in engineering SMEs", *Robotics and Computer-Integrated Manufacturing*, Vol. 23 No.6, pp. 696-703.

Castka, P. and Corbett, C.J. (2015), "Management systems standards. diffusion, impact and governance of ISO 9000, ISO 14000 and other management systems standards", *Foundations and Trends in Technology, Information and Operations Management*, Vol. 7 No. 3-4, pp. 161-379.

Chan, E.S.W. (2011), "Implementing environmental management systems in small and medium-size hotels: obstacles", *Journal Hospitality & Tourism Research*, Vol. 35 No. 1, pp. 3-23.

Corbett, C.J., Montes-Sancho, M.J. and Kirsch, D. (2005), "The financial impact of ISO 9000 certification in the United States: an empirical analysis", *Management Science*, Vol. 51 No. 7, pp. 1046-1059.

Creswell, J.W. (2013), *Qualitative inquiry and research design. Choosing among five approaches*, 3rd edition, SAGE Publications, Inc., London, UK

de Oliveira, O.J. (2013), "Guidelines for the integration of certifiable management systems in industrial companies", *Journal of Cleaner Production*, Vol. 57 October, pp. 124-133.

Deming, E. (1986), *Out of the Crisis,* MIT Press, Cambridge, MA, US.

DIRCE (2016). *Retrato de la PYME a 1 de enero de 2016. Directorio Central de Empresas*, Ministerio de economía, industria y competitividad, Madrid, Spain.

Dobele, A.R., Westberg, K., Steel, M. and Flowers, K. (2014), "An Examination of Corporate Social Responsibility Implementation and Stakeholder Engagement: A Case Study in the Australian Mining Industry", *Business Strategy and the Environment*, Vol. 23 No. 3, pp. 145–159.

Domingues, J.P.T., Sampaio, P. and Arezes, P.M. (2015), "Analysis of integrated management systems from various perspectives", *Total Quality Management & Business Excellence*, Vol. 26 No. 11-12, pp. 1311-1334.

Douglas, A. and Glen, D. (2000), "Integrated management systems in small and medium enterprises", *Total Quality Management*, Vol. 11 No. 4-6, pp. 686-690.

Duijm, N.J., Fiévez, C., Gerbec, M., Hauptmanns, H. and Konstandinidou, M. (2008), "Management of health, safety and environment in process industry", *Safety Science*, Vol. 46 No. 6, pp. 908-920.

Ferron Vilchez, V. and Darnall, N. (2016), "Two are better than one: The link between management systems and business performance", *Business Strategy and the Environment*, Vol. 25 No. 4, pp. 221-240.

Garvin, D.A. (1984), "Product quality: an important strategic weapon", *Business Horizons*, Vol. 27 No. 3, pp. 40-43.

Gianni, M. and Gotzamani, K. (2015), "Management Systems integration: lessons from an abandonment case", *Journal of Cleaner Production*, Vol. 86 January, pp. 265-276.

Gianni, M., Gotzamani, K. and Vouzas, F. (2017), "Food integrated management systems: dairy industry insights", *International Journal of Quality and Reliability Management*, Vol. 34 No. 2, pp. 194-215

González Pedraza, R. and Lambán Castillo, P. (2014), "Costs modelling applied to activities of integrated management", *Key Engineering Materials*, Vol. 615, pp. 124-129.

Heras, I. and Arana, G. (2010), "Alternative models for environmental management in SMEs: the case of Ekoscan vs. ISO 14001", *Journal of Cleaner Production*, Vol. 18 No. 8, pp. 726-735.

Heras-Saizarbitoria, I. and Boiral, O. (2015), "Symbolic adoption of ISO 9000 in small and medium-sized enterprises: The role of internal contingencies", *International Small Business Journal*, Vol. 33 No. 3, pp. 299-320.

Hernández-Vivanco, A., Bernardo, M. and Cruz-Cázares, C. (2016), "Relating open innovation, innovation and management systems integration", *Industrial Management and Data Systems*, Vol. 116 No. 8, pp. 1540-1556

ISO, (2008), *The integrated use of management system standards*, International Organization for Standardization, Geneva, Switzerland.

ISO, (2016), *The ISO Survey of Certifications - 2015*, International Organization for Standardization, Geneva, Switzerland.

Kafetzopoulos, D. and Gotzamani, K. (2014), "Critical factors, food quality management and organizational performance", *Food Control*, Vol. 40, pp. 1-11.

Karapetrovic, S. and Willborn, W. (1998a), "Integration of quality and environmental management systems", *The TQM Magazine*, Vol. 10 No. 3, pp. 204-213.

Karapetrovic, S. and Willborn, W. (1998b), "Integrated audit of management systems", *International Journal of Quality & Reliability Management*, Vol. 15 No. 7, pp. 694-711.

Karapetrovic, S. (2002), "Strategies for the integration of management systems and standards", *The TQM Magazine*, Vol. 14 No. 1, pp. 61-67.

Karapetrovic, S. (2003), "Musings on integrated management systems", *Measuring Business Excellence*, Vol. 7 No. 1, pp. 4-13.

Karapetrovic, S. (2005), "IMS in the M(E)SS with CSCS", *Total Quality Management and Excellence*, Vol. 33 No. 3, pp. 19-25.

Karapetrovic, S., Casadesús, M. and Heras, I. (2006), *Dynamics and integration of standardized management systems. An empirical study*, Documenta Universitaria. GITASP 1, Girona, Spain.

Klassen, R.D. and Whybark, D.C. (1999), "Environmental management in operations: the selection of environmental technologies", *Decision Sciences*, Vol. 30 No. 3, pp. 601-631.

Kraus, J. and Grosskopf, J. (2008), "Auditing Integrated Management Systems: Considerations and Practice Tips", *Environmental Quality Management*, Vol. 18 No. 2, pp. 7-16.

Labodová, A. (2004), "Implementing integrated management systems using a risk analysis based approach", *Journal of Cleaner Production*, Vol. 12 No. 6, pp. 571-580.

Llach, J., Perramon, J., del Mar Alonso-Almeida, M. and Bagur-Femenías, L. (2013), "Joint impact of quality and environmental practices on firm performance in small service businesses: An empirical study of restaurants", *Journal of Cleaner Production*, Vol. 44 April, pp. 96-104.

Martí-Ballester, C.P. and Simon, A. (2017), "Union is strength: the integration of ISO 9001 and ISO 14001 contributes to improve the firms' financial performance", *Management Decision*, Vol. 55 No.1, pp. 81-102.

Martínez-Costa, M., Martínez-Lorente, A.R. and Choi, T.Y. (2008), "Simultaneous consideration of TQM and ISO 9000 on performance and motivation: an empirical study of Spanish companies", *International Journal of Production Economics*, Vol. 113 No. 1, pp. 23-39.

Masurel, E. (2007), "Why SMEs invest in environmental measures: Sustainability evidence from small and medium-sized printing firms", *Business Strategy and the Environment*, Vol. 16 No. 3, pp. 190–201.

Moore, G. and Spence, L. (2006), "Responsibility and Small Business", *Journal of Business Ethics*, Vol. 67 No. 3, pp. 219–226.

Nishitani, K. (2011), "An empirical analysis of the effects on firms' economic performance of implementing environmental management systems", *Environmental and Resource Economics*, Vol. 48 No. 4, pp. 569-586.

Pho, H.T. and Tambo, T. (2014), "Integrated management systems and workflow-based electronic document management: An empirical study", *Journal of Industrial Engineering and Management*, Vol. 7 No. 1, pp. 194-217.

Rebelo, M., Santos, G. and Silva, R., (2014b), "A generic model for integration of quality, environment and safety management systems", *TQM Journal*, Vol. 26 No. 2, pp. 143-159.

Revell, A. and Blackburn, R. (2007), "The business case for sustainability? An examination of small firms in the UK's construction and restaurant sectors", *Business Strategy and the Environment*, Vol. 16 No. 6, pp. 404–420.

Richter, U.H. and Arndt, F.F. (2016), "Cognitive processes in the CSR decision-making process: a sensemaking perspective", *Journal of Business Ethics*, pp. 1-16

Rocafort Nicolau, A. and Ferrer Grau, V. (2010), *Contabilidad de costes : fundamentos y ejercicios resueltos*, Bresca-Profit, Barcelona, Spain

Salomone, R. (2008), "Integrated management systems: experiences in Italian organizations", *Journal of Cleaner Production,* Vol. 16 No. 16, pp. 1786-1806.

Santos, G., Mendes, F. and Barbosa, J. (2011), "Certification and integration of management systems: the experience of Portuguese small and medium enterprises", *Journal of Cleaner Production*, Vol. 19 No. 17-18, pp. 1965-1974.

Simon, A., Bernardo, M., Karapetrovic, S. and Casadesus, M. (2011), "Integration of standardized environmental and quality management systems audits", *Journal of Cleaner Production*, Vol. 19 No. 17-18, pp. 2057-2065.

Simon, A. and Pentji Yaya, L. (2012), "Improving innovation and customer satisfaction through systems integration", *Industrial Management & Data Systems*, Vol. 112 No. 7, pp. 1026 – 1043.

Simon, A. and Douglas, A. (2013), "Integrating management systems: Does the location matter?", *International Journal of Quality and Reliability Management*, Vol. 30 No. 6, pp. 675-689.

Simon, A., Pentji Yaya, L.H., Karapetrovic, S. and Casadesus, M. (2014), "An empirical analysis of the integration of internal and external management system audits", *Journal of Cleaner Production*, Vol. 66 March, pp. 499-506

Shah, K.U. (2011), "Organizational Legitimacy and the Strategic Bridging Ability of Green Alliances", *Business Strategy and the Environment*, Vol. 20 No. 8, pp. 498–511.

Shapiro, B. and Naughton, M. (2015), "The expression of espoused humanizing values in organizational practice: a conceptual framework and case study", J*ournal of Business Ethics*, Vol. 126 No. 1, pp. 65-84.

Terziovski, M., Samson, D. and Dow, D. (1997), "The business value of quality management systems certification", *Journal of Operations Management*, Vol. 15 No. 1, pp. 1-18.

Yin, R.K. (2009), *Case Study Research: Design and Methods*, 4th ed. Sage Publications, Thousand Oaks, CA.

Wenk, M.S. (2006), *Discussion on Environmental Management Systems*. Springer, Netherlands.

Zeng, S., Shi, J. and Lou, G. (2007), "A synergetic model for implementing an integrated management system: an empirical study in China", *Journal of Cleaner Production*, Vol. 15 No. 18, pp. 1760-1767.

Zeng, S., Xie, X., Tam, C. and Shen, L. (2011), "An empirical examination of benefits from implementing integrated management systems (IMS)", *Total Quality Management & Business Excellence*, Vol. 22 No. 2, pp. 173-186.