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Paulo Sampaio, Pedro Saraiva, Pedro Domingues

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Management systems: integration or addition?

Paulo Sampaio

Systems and Production Department, University of Minho, Braga, Portugal

Pedro Saraiva

*Chemical Engineering Department, University of Coimbra,
Coimbra, Portugal, and*

Pedro Domingues

Systems and Production Department, University of Minho, Braga, Portugal

Abstract

Purpose – In the past few years, management systems implementation and certification has become a common practice among different types of organizations. In this context, quality management systems certification, according to the ISO 9001 standard is in the spotlight, due to over than 1.000.000 certified organizations by the end of 2009. Quality management systems can be integrated with an increasing variety of other subsystems implemented according to other standards, including environmental systems, health and safety, social responsibility, R&D, risk, or human resources, and subsystems raised from specific standards designed for specific activity sectors (HACCP, automotive or aeronautics, medical devices, pharmaceuticals and software). Due to this evolution, careful attention should be taken on how these different subsystems have been and should be articulated, harmonized and integrated. Thus, this paper intends to approach different strategies to achieve integration, with several levels of intensity, depth and authenticity between the different subsystems, and report some final recommendations related with good practices assuring the efficiency and effectiveness of the integration process.

Design/methodology/approach – A case study methodology has supported this research. Three case studies were conducted on Portuguese companies that have an integrated quality, environmental and safety management system.

Findings – If the companies' strategy is to implement more than one management system, there is a clear advantage of doing it supported on an integrated approach, avoiding the development of organizational "islands" related to each subsystem. This organizational "archipelago" structure is completely far way from any global optimized solution, based on a holistic perspective.

Originality/value – Based on the conclusions that we were able to find out, this paper is an important contribution to the integrated management systems research area, because it states different integration approaches and levels of integration and what are the features that characterize each one of those approaches and levels.

Keywords Management systems, Integration, Management techniques, Case studies

Paper type Research paper



Introduction

A management system may be defined as a set of inter-related organizational processes, sharing resources to achieve several organizational goals. In this context an organizational management system includes planning, product/service realization, monitoring and improvement activities. According to Karapetrovic *et al.* (2006) management systems are supported on two main basic principles: systematization and responsibility accountability. A management system implementation does not require,

but should enhance, an organizational performance minimum level and a predefined goal achievement. It establishes the need of organizational processes systematization and formalization related with the different business areas.

Benefits of management systems implementation have been highlighted in numerous reported papers. Bottani *et al.* (2009) reported that companies adopting a safety management system exhibit a higher overall performance. Dordevic *et al.* (2010), in a study among Serbian small and medium enterprises (SMEs), pointed out that the enhancement of the enterprise overall features, the creation of frameworks for implementation of recognized standards for management systems and the creation of an integrated scheme for independent controls of integrated management systems (IMS) had a major impact on the development of IMS worldwide. Despite of this, not ever management system implementation is conducted conscientiously leading to the common criticism related to the bureaucratic load increase, organizational stiffness (Seddon, 2000) and intra-organizational *ghettos*.

Organizational integration definition has been a quest in the last years. Garvin (1991) related integration to a measure of the alignment or harmony in an organization and, later, MacGregor Associates (1996) defined it as a single top level management “core” standard with optional modular supporting standards covering specific requirements. Labodová (2004) and Suditu (2007) implicitly related integration concept to sustainability and sustainable development, namely economic, when they stated that a sustainable organization is characterized by a minimum environmental impact, economic viability with policies and vision focusing on continual improvement preventive approach (Labodová, 2004; Suditu, 2007; Jorgensen *et al.*, 2006). Griffith (2000) stated that IMS blend together quality, environmental and health and safety procedures in order to demonstrate externally the company commitment to deliver a product or service, improve environmental performance and better health and safety management. Suditu (2007) described an IMS as the organizational structure, resources and procedures that supports the planning, monitoring, quality control, safety and environmental activities of an organization. Table I shows the main reported organizational integration definitions.

Source	Year	Definition
Garvin	1991	“[...] measure of the alignment or harmony in an organization”
MacGregor associates	1996	“[...] a single top level management “core” standard with optional modular supporting standards covering specific requirements”
Karapetrovic and Wilborn	1998	“[...] interrelated processes set sharing human and financial resources, information, materials and infrastructures aiming several objectives focus on stakeholders satisfaction”
Griffith	2000	“[...] blend together quality, environmental and health and safety procedures in order to demonstrate externally the company commitment to deliver a product or service, improved environmental performance and better health and safety management”
Suditu	2007	“[...] organizational structure, resources and procedures that support the planning, monitoring, quality control, safety and environmental activities of an organization”

Source: Domingues *et al.* (2011d)

Table I.
IMS definitions

Management systems integration has been linked as a potential enabler of other concepts. Oskarsson and Malmberg (2005) reported how management systems integration may be understood as the organization feedback to the challenge presented by sustainable development. Later, Rocha *et al.* (2007), reported how to insert the sustainable development concept in implemented management systems. In this paper, the authors proposed a model aiming the management systems implementation supported on the sustainable development concept. Furthermore, Meyer *et al.* (2008) stated that the health and safety promotion among employees should be performed on a process perspective, under an integrated approach.

Generically, an IMS is a blend of two or more management subsystems under a holistic approach arising organizational interactions (Okrapilov, 2010). Recently, some authors stated that management systems standards suitable for integration are ruled by a risk identification approach (for the product/service quality, environment or health and safety) assuring control procedures to manage those risks, which place the risk concept as a possible integrator or pivot factor of the integration management system implementation (Noy and Ellis, 2003; Labodová, 2004; Williams *et al.*, 2006; Grosskopf *et al.*, 2007; Nitu and Nitu, 2011). For instance, a decrease of non-conformities could be understood as:

- The losses risk decrease due to reworks or scrap.
- The under rated quality products risk decrease to be shipped to the customer.
- The environmental risk decrease (raw material and energy consumption decrease and residues production decrease).
- The health and safety related risk decrease (as processes are better understood the accidents probability decrease).
- Risk to customers decrease (non conformity products are a probable cause for customers accidents).

Additionally, Jorgensen (2008) linked the sustainable management systems concept to life cycle management and integration.

In our days, there are not so many quantitative and objective data related to management systems integration, comparing with the non-IMS available data. Due to this fact many questions remain unanswered:

- Did integration fulfil the organizations expectations?
- What were those expectations/motivations?
- What is the best path/approach for integration?
- Does integration truly increase management systems effectiveness?
- Which are the most suitable subsystems for integration?
- Is integration just the sum of subsystems procedures or it represents some additional added-value?

In this paper we will try to give some answers to the previous set of questions, thus providing what we believe to be an important contribution in this field.

IMS literature review

Management systems certification worldwide overview

On a global perspective, the management systems diffusion success has a major relation with the occidental economies globalization process dynamics, namely the role of multinational organizations. In this sense, the quality management systems implementation and certification are the major quantitative reference on management systems certification universe. According to the last ISO survey edition, the number of worldwide organizations with certified quality management systems increased to 1,064.785, among 178 countries (ISO, 2010). China is leading the top ten countries with 257.076 issued certificates, followed by Italy with 130.006 certified organizations. However, the scores reported by ISO during the last recent years suggest that there is an apparent market saturation concerning ISO 9001 certified organizations. By December 2009, the number of ISO 14001 issued certificates was of 223.149. China leads also the ISO 14000 top ten countries with 55.316 issued certificates, followed by Japan with 39.556 certified companies. Based on statistical models, Sampaio *et al.* (2011) described and forecasted the ISO 9001 evolution on a worldwide and a country basis.

Karapetrovic *et al.* (2006) reported, in a longitudinal study that 60 percent of the surveyed companies did present an integrated quality and environmental management system and 10 percent of those companies had integrated quality, environmental and health and safety areas. It is important to point out that 15 percent of the companies did not really an IMS (Karapetrovic *et al.*, 2006, cited by Sampaio *et al.*, 2010). Zeng *et al.* (2005) in a study conducted among Chinese construction companies reported that 88 percent of the surveyed companies were ISO 9001 certified, 35 percent did present quality and environmental management subsystems and 3 percent did have an integrated quality and environmental management system. Recently, a Malaysian study reported that 73 percent of the targeted organizations were committed to implement an IMS in a short time period (Arifin *et al.*, 2009).

Portuguese reality overview

By December 2009 there were in Portugal 5.051 ISO 9001 certified organizations and 632 ISO 14001 registered ones (ISO, 2010). Saraiva and Sampaio (2010) reported that the total number of certified companies for both standards corresponds, respectively, to 12.7 percent and 1.4 percent of Portuguese companies with ten or more workers. Additionally, the authors found out that 0.54 percent of the Portuguese companies do have a quality, environmental and safety IMS.

When we compare the Portuguese reality with the remaining European Union countries concerning the number of companies with an IMS, one can see that the Portuguese state-of-the-art is similar to the remaining EU countries. However, it is important to point out that there is still a lot of work to be done concerning management systems integration. Figure 1 shows the Portuguese overview in terms of management systems integration.

The most common management systems integration in the Portuguese companies is the quality and environmental one, followed by ISO 9001, ISO 14001 and OSHAS 18001 integration. We would like to point out that these results partially reflect the standards chronological publication.

In Figure 2 one can verify the IMS evolution from 2007 to 2008, both in absolute values and relative ones - percentage and number of issues certificates per 1,000 inhabitants.

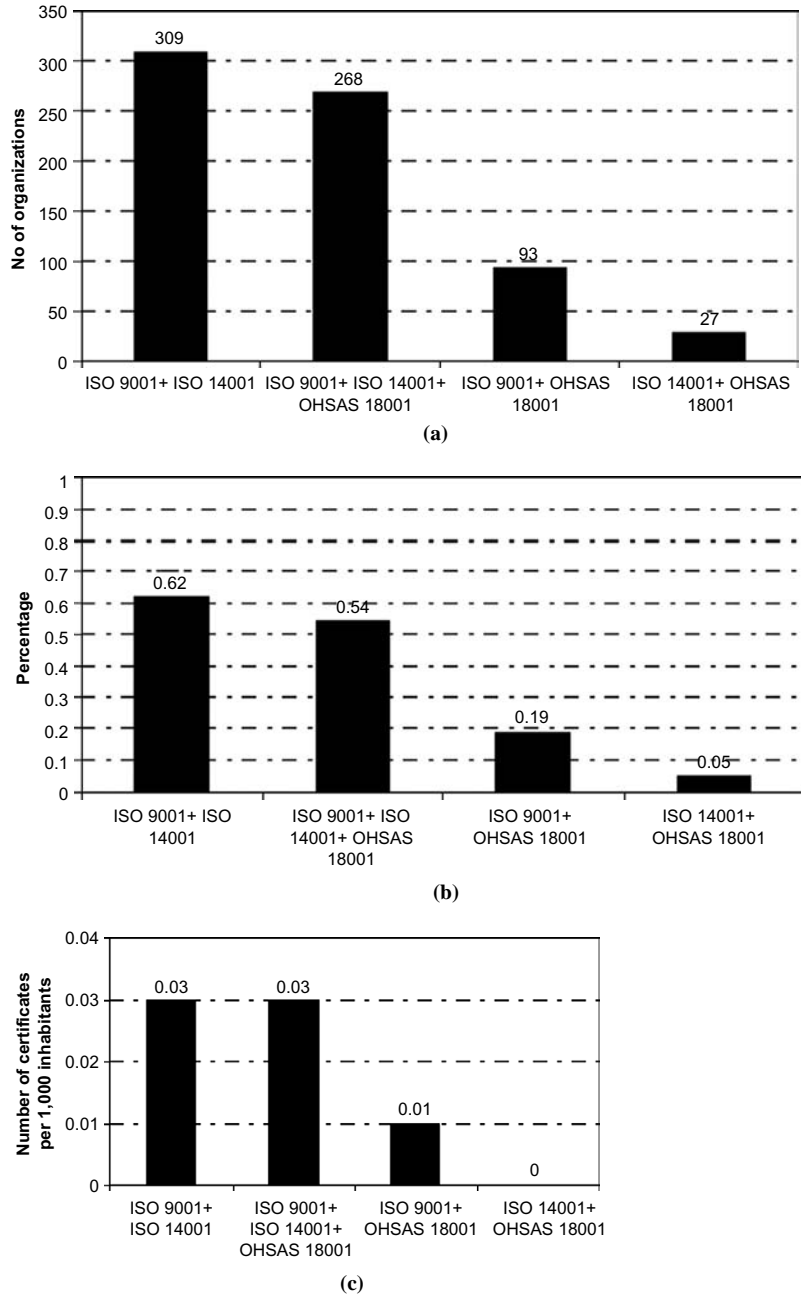
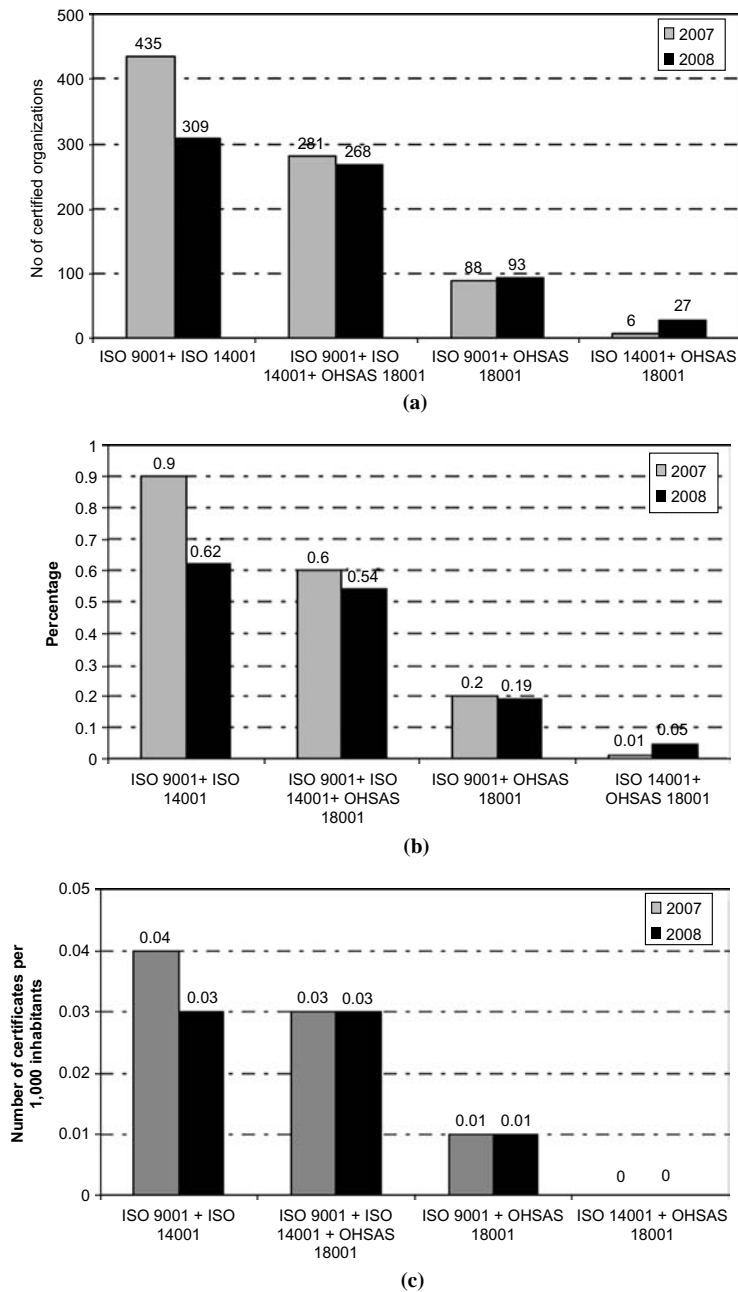


Figure 1.
Management systems
integration in Portugal

Source: Adapted from Saraiva and Sampaio (2010)



Source: Adapted from Saraiva and Sampaio (2010)

Figure 2. Management systems integration evolution

According to Figure 2, one can verify that there was a decrease in the number of companies with quality and environmental integration and quality, environmental and safety integration from 2007 to 2008. The remaining types of management systems integration increased in the same time period.

A wide range of management systems standards is available, covering almost all organizational functional areas, with the aim of providing an improved confidence both for internal and external customers. Karapetrovic and Willborn (1998a, b) and Karapetrovic (2003) pointed out a number of factors that could influence the standard choice by a company. Standard widespread international acceptance and customers' pressure are among those factors. The most well known and adopted standards by the majority of the organizations are the ISO 9001 standard (for quality management systems), the ISO 14001 standard (for environmental management system) and the OHSAS 18001 standard (for occupational health and safety). Regardless of these most popular standards, there is an emerging set of others that are implemented by a more reduced number of organizations, like ISO 22000 for food safety management systems, ISO/TS 16949 for automotive industry (quality management system), SA 8000 for social responsibility management systems, etc.

Non-IMS – limitations

According to Winder (2000), management is like a football game: if we did not perceive anything, it works. Organizations approach and interaction with external inputs, economics or legislative, are strongly related with the implemented management system. Some organizations avoid those influences exposing themselves to sanctions, and others adopt a minimalist/reactive approach which leads to limitations when some external structural changes takes place (economical or environmental changes, increased taxation, new legislation, new technology, etc). Internal occurrences (accidents, fraud and bad management) could also trig the insufficiencies of this kind of approach (Winder, 2000). Brewer *et al.* (2005) stated that independent and autonomous management subsystems with different management teams are against basic management good practices (Badreddine *et al.*, 2009). The authors also concluded that this fact leads to each team "pushing" in different directions, increasing the lack of internal cohesion to achieve a common objective. Ismail *et al.* (2009) verified that independent subsystems tend to isolate themselves, avoiding some expected benefits to be reached.

Management systems integration requires, more than a process approach, a system approach to management due to requirements increase focusing different stakeholders (Asif *et al.*, 2010a, b). Several authors pointed out the difficulty of an organization to deal with separate management systems (Labodová, 2004; Zeng *et al.*, 2010; Domingues *et al.*, 2011c). Concerning this issue, the following reasons are highlighted in the literature – personnel different educational backgrounds and perspectives, the traditional organizational structures emphasizing functional departmentalization (Milliman *et al.*, 2005), mistakes and failures increase probability, efforts duplication, bureaucracy and documentation increase and the negative impact on the employees and customers (Arifin *et al.*, 2009; Zeng *et al.*, 2010).

Robson *et al.* (2007) stated that top management commitment level towards a product quality tends to be higher than commitment level towards occupational and health and safety (OHS) issues. The authors did present some concerns in terms of OHS management system effectiveness due to increasing of globalization, precarious work and employees union decline.

Actually, regulatory entities, customers and general public do not tolerate non-conform products, quality under rated services or environmental damages. Moreover, organizations stakeholders demand continuous improvement on quality, health and safety an environment that non-IMS cannot provide (Winder, 2000). Regardless of this, Zeng *et al.* (2010) reported that the most common problems related to multiple non-IMS are the increasing of internal management complexity level, the decreasing of management effectiveness and the increasing management costs. According to Ismail *et al.* (2009), “local” interests related to each management subsystem overlapping global organization interests became the major problem of non-IMS. On a different perspective, Krzemien and Wolniak (2005) concluded that information system will be optimized if designed on an integrated approach.

IMS – motivations and benefits, resistances, assessment, integration strategies and integration levels

Integration motivations and benefits. Several authors state that companies should evolve through the integration of their management systems. Despite of this, results could be unpredictable or a frustrating illusion (Winder, 2000). Suditu (2007) emphasized that the management system single action does not assure better performance. Regardless these issues, all the organizations do present external and internal reasons and resistances to integrate management subsystems (Tari and Molina-Azorin, 2010). However, usually, there is only one motivation category that is the most important one (Sampaio *et al.*, 2010; Saraiva and Sampaio, 2010).

Internal reasons and related benefits may be divided into organizational, financials and benefits for employees and external reasons and related benefits into commercial, communicational and quality, environmental and safety benefits (Suditu, 2007).

External reasons are mainly related to marketing issues, customers’ pressure, promotional aspects, customers pressure, certification by an independent entity, market share improvement, commercial strategy, facilitation of contact with customers and regulatory changes readiness action (non development organizations) (Spilka *et al.*, 2009; Lahav, 2008; Sampaio *et al.*, 2009; Zeng *et al.*, 2010).

Organizations that become certified based on organizational improvement are driven by internal reasons – productivity improvement, internal communication, internal processes performance improvement, similarity and compatibility between standards (Spilka *et al.*, 2009; Arifin *et al.*, 2009; Sampaio *et al.*, 2010; Tari and Molina-Azorin, 2010). The internal motivation driven companies, usually, experience more benefits from management system implementation. Obviously, seeking for costs reduction, redundancies elimination through documentation homogenization (Spilka *et al.*, 2009; Salomone, 2008; Dordevic *et al.*, 2010), regulatory or voluntary standards compliance (Leopoulos *et al.*, 2010; Khanna *et al.*, 2010; Asif *et al.*, 2010a; Domingues *et al.*, 2010), synergistic “energies” maximization, product quality improvement (Spilka *et al.*, 2009; Grael and Oliveira, 2010), communication and training improvement, sharpen organizational “big picture”, work consciousness and work safety improvement and a transversal approach implementation are among those internal reasons (Spilka *et al.*, 2009; Kraus and Grosskopf, 2008; Filho and Souza, 2006; Salomone, 2008; Badreddine *et al.*, 2009). Other authors also pointed out the organizational flexibility improvement, the management system openness (Baird, 2000), the registration costs decrease (Zeng *et al.*, 2010) and the disruptions decrease in the plant operations due

to lesser audits (Dordevic *et al.*, 2010). Dordevic *et al.* (2010) and Domingues *et al.* (2011a, b) emphasized that management systems integration provide the best practice to promote knowledge in all functional areas – quality, environment and occupational health and safety.

Integration resistances. The obstacles and resistances related to the integration process can be of internal or external nature. The internal resistances are mainly related to lack of resources, attitudes, organization involvement and commitment, implementation process, identification of environmental aspects, documents development, awareness and training of employees focusing on IMS implementation, change of personnel consciousness and fulfilment of legal requirements (Spilka *et al.*, 2009).

Regarding external resistances, the consulting activities, the financial resources limitations and the certification bodies' role are among the most cited ones (Suditu, 2007; Salomone, 2008). According to Saraiva and Sampaio (2010) and Winder (2000), for the majority of the companies, the integration process does present some important barriers like the lack of human resources and governmental financial support. Other resistances frequently pointed out in the literature are related to the lack of knowledge of the auditors concerning all the auditable management systems and the different management teams managing different departments (Zutshi and Sohal, 2005; OECD, 2005). Carter (1999) mentioned internal communications difficulties caused by differences between QMS, EMS and OHSMS. Winder (2000) pointed out the internal resistance against change, subsystems managers' competence in an integrated environment and the organizational change dimension.

An international standard for implementing an IMS has not been published yet. The integration concept raises some concerns related to the perception that the implemented management subsystems are enough for the organization performance, to the middle management scepticism, to the unsuccessful quality related past experiences and to the lack of pressure from customers or competitors (Beckmerhagen *et al.*, 2003a, b; Domingues *et al.*, 2011c, d). OECD (2005) pointed out that the effectiveness of risk identification and control through single management systems is related to the organization and activity sector. Recently, Kaziliunas (2008) pointed out some problems of auditing a wider vision organization through a QMS philosophy.

Ultimately, all these concerns are related with organizational changes. Winder (2000) reported several resistances to organizational changes (emotional, attitudes and believes) and, according to him, changes resistances are caused by:

- Diffuse information related to new system being implemented.
- Lack of employees' involvement and commitment.
- Lack of information related to the new organizational roles.
- Lack of motivation on the implementation process.

Integration assessment. In the last few years some efforts had been developed, in order to evaluate a non-IMS performance. Costella *et al.* (2009) reported a methodology for assessing health and safety management system based on the three main auditing approaches – structural, operational and performance. Sgourou *et al.* (2010) proposed the assessment of selected safety performance evaluation methods regarding their conceptual, methodological and practical characteristics. Hale *et al.* (2010) on the purpose to define effective intervention strategies emphasized the evaluation of safety

management and culture interventions. Zutshi and Sohal (2005) concluded that the extent of integration of the different systems would be influenced by the organizational culture, nature and size. Beckmerhagen *et al.* (2003a) stated that management systems should enhance managerial and operational effectiveness suggesting that the main goal in integration is the resources optimization.

Hence, assessing a management system performance is a critical task. Performance measurement has been defined as the process of quantifying the efficiency and effectiveness of action (Sousa *et al.*, 2005). Measurements approaches related to financial results are considered today a narrow evaluation and organizations are using a range of strategies and operations-based performance indicators as a supplement for evaluation (Sousa *et al.*, 2005; Neves and Sampaio, 2011). In the last few years the interest in the development of theoretical frameworks on performance measurement has increased (Ahmed, 2002). Venturelli and Pisili (2005) developed an assessment model supported on environmental accountability, indexing values to each standard item.

IMS implementation strategies. Integration may be achieved by different ways. Wilkinson and Dale (2000), cited by Nee (2009), concluded that quality, environmental and health and safety management systems could be integrated by merging documentation (aligned approach) or by implementing an IMS (IMS – total quality approach). Sampaio *et al.* (2008) stated that management systems integration reflects the chronological standards publication time. This conclusion was also verified by Karapetrovic *et al.* (2006). An organization could adopt three different integration strategies: augmentation, assimilation or ascension or add nothing (Karapetrovic *et al.*, 2006). Cited by Zeng *et al.* (2005), Karapetrovic and Willborn (1998a) proposed three different strategies for integration of quality and environmental management systems:

- (1) Establish a quality management system and subsequently an environmental management system.
- (2) Establish environmental management system and subsequently a quality management system.
- (3) Establish environmental management system and quality management system simultaneously.

Usually every integration process follows the common steps that are shown in Figure 3.

Badreddine *et al.* (2009) reported a multi-objective approach on implementing an IMS, supported in three factors: risk management, process focus and monitoring. Winder (2000) emphasized that the adopted strategy should consider the organization reputation, market position, external relationships and resources. Hines (2002), cited by Jorgensen *et al.* (2006) proposed the following two strategies:

- (1) Alignment: this strategy is supported on standards similarities. A simultaneous approach should be adopted, keeping procedures apart but a single manual. This approach goal is to reduce administrative and audit costs.
- (2) Total integration: procedures and instructions total integration supported on a TQM approach.

Several case studies have been reported focusing IMS implementation. López-Fresno (2010) reported the process and implications of an integration process in an airline. Additionally, the author proposed an integration model based on a systemic approach.

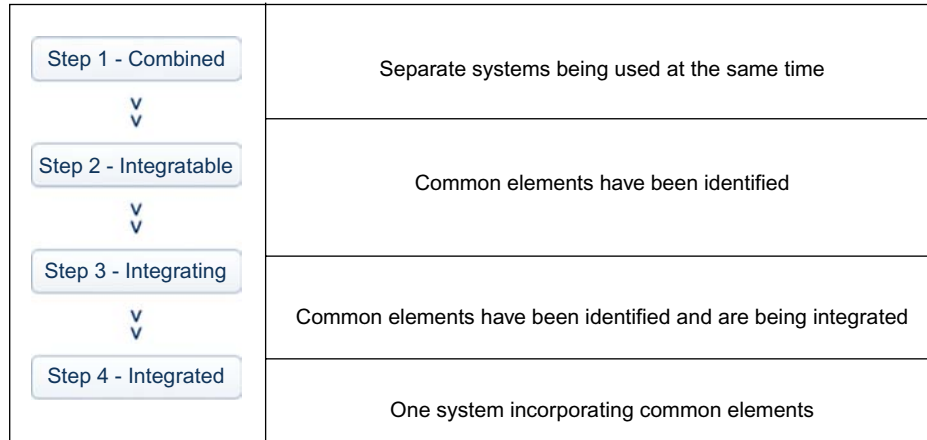


Figure 3.
Steps of an
integration process

Source: Adapted from BSI (2010); “Permission to reproduce extracts from the BSI web site is granted by BSI. No other use of this material is permitted”

Fresner and Engelhardt (2004) concluded that sustainable development could be attained considering cleaner production, integrated management, influencing the supply chain and improving product and service features. Furthermore, Davies (2008) reported that the EFQM excellence model could be properly implemented considering an integrated overview of shareholders requirements.

Management systems integration levels. Both the sequence of implementation and the integration level achieved are of utmost importance when analysing an IMS (Tari and Molina-Azorin, 2010).

Hines (2002) cited by Jorgensen *et al.* (2006) distinguished between three integration levels:

- (1) *Corresponding.* Compatibility increase with management systems cross references.
- (2) *Coherent and coordinate.* Generically processes focusing management system tasks.
- (3) *Strategic and inherent.* With a learning organizational culture, continuous improvement and stakeholder’s involvement focusing internal and external challenges.

Recently, Ho (2010) suggested a lean TQM model focusing management system integration as a viable path for sustainable development. Idrogo *et al.* (2011) proposed a model weighted by ISO 9001, ISO 14001 and BS 8800 requirements that could develop organizational interactions on an integrated context. A model concerning the process approach philosophy, management by aims and by improvement and focusing an effective and efficient system was proposed by Spilka *et al.* (2009). In 2010, Campos and Medeiros developed an innovative model focusing IMS based on linear mathematics programming, set theory and combinatorial mathematics aiming a more objective assessment than traditional models.

Research methodology

According to Sampaio *et al.* (2009) the majority of ISO 9001 certification research studies conducted so far are supported by survey methodologies and descriptive statistics. As such, they express conclusions that are mainly derived from opinions and perceptions about the subject. Thus, it is common to find in the open literature references that point out the highly subjective results derived from such studies (often of somewhat contradictory nature). Thus, in order to avoid some of these issues, the research methodology used to conduct this study was case-based. However, we would like to point out that we weren't able to perform a significant number of case studies, which is one of the research main limitations.

Case and field research studies continue to be rarely published in operations management (Meredith, 1998). The case study is a research strategy which focuses on understanding the dynamics present within single settings (Eisenhardt, 1989). According to Voss *et al.* (2002) case research has consistently been one of the most powerful research methods, mainly in the development of new theory. The research base on analysis of a limited number of cases is widely used in Europe but is less common in North American research teams (Drejer *et al.*, 1998).

Case studies typically combine data collection methods and observations. The evidence may be qualitative, quantitative or both (Eisenhardt, 1989). According to Meredith (1998), the case research methods, if combined with rationalist methods, can offer even greater potential for enhancing new theories than either method alone. Rationalism generally employs quantitative methodologies to describe or explain phenomena and includes optimization models, simulation modeling, survey methodology and laboratory experiments. On the other side, case and field study is one example of an alternative research paradigm and uses both quantitative and qualitative methodologies to help understand phenomena. Case/field research methods are useful for situations that require a deeper understanding of what is happening to modify or extend current theory. A case study typically uses multiple methods and tools for data collection from a number of entities by a direct observer in a single, natural setting that considers temporal and contextual aspects of the phenomena under study.

According to Eisenhardt (1989) the single case is particularly appropriate for completely new and exploratory investigations. Regarding the multiple case study of two to eight situations, this methodology is appropriate when there is some knowledge about the phenomenon but much is still unknown. In this paper we used this second methodology, because, in our opinion, there is a lot of research related to the management systems integration. Increasing the number of units further into low teens brings us to a situation where both statistical and case methods are equally applicable. According to Boyer and McDermott (1999) and McLachlin (1997) the number of cases suggested to test a theory already proposed ranges from six to seven. Additionally, Voss *et al.* (2002) stated that the fewer the case studies, the greater the opportunity for depth of observation.

Knowledge of how operations systems work can be enhanced significantly through contact with the "real-world" conditions that operations management models seek to describe (McCutcheon and Meridith, 1993). According to the authors, case study research is a primary means of exploring field conditions. However, regardless of their purposes, case study research needs to be conducted in a manner that assures maximum measurement reliability and theory validity. The results of case study research can have

very high impact, because they can lead to new and creative insights, development of new theory and have a high validity with practitioners (Drejer *et al.*, 1998).

Sample selection

The case study methodology had supported this research. Three case studies were conducted on Portuguese companies that have a certified integrated quality, environmental and safety management system. Our initial aim was to study four organizations in total, two industrial sector organizations and two service sector ones, in order to analyse and compare which factors characterize a high level of integration and which factors are related to a low one, taking into account the firms' activity sector. However, only three organizations were available to collaborate, two from the industrial sector (high and low integration level) and one that belongs to the service sector (high integration level). Integration level classification (high/low) was based on information provided by companies' certification bodies, which had been previously contacted in order to indentify companies with a certified IMS (ISO 9001, ISO 14001 and OHSAS 18001) and classify them concerning the system integration level.

Interview protocol

Typically the prime source of data in case research is structured interviews (Voss *et al.*, 2002). Thus, we have developed an interview protocol, which was then tested, by making a pilot case study. With the inputs that were collected in this pilot case study, we reached a revised and final framework version to be used in our interviews. The interviews were performed with the companies' quality directors/managers, since they are directly involved in the process and have first-hand knowledge of quality practices implementation in their companies. Our interviews comprised 11 questions that will be presented in the next section.

Case studies – how companies are integrating their management systems?

This section presents the results and analyses that have resulted from the case studies performed. Table II shows some of conclusions reached both for the “high integration level organizations – HILO” and for the “low integration level organizations – LILO”, that will be further discussed in this section.

As is shown in Table II different chronological paths are possible when implementing an IMS. Both the two high level integration organizations and the low level integration one do present different temporal milestones in order to achieve integration. Regarding the high integration level organizations, for Company 2 the quality management system was the “quarterback” and the environmental and safety management systems only emerged later on, following the chronological order of the standards publication. On the other hand, Company 1 had simultaneously integrated quality, environmental and health and safety subsystems. The company with a low integration level had begun the integration process by integrating the documental procedures, but maintaining the three management subsystems operating simultaneously.

Internal motivations should drive organization sin order to achieve the management systems integration. This category of motivations was present in those companies that are really committed with the continuous improvement philosophy and that integrated their management systems in order to effectively increase their organizational performance (Companies 1 and 2). Surprisingly, the company with a low level

	HILO	LILO
Integration process time evolution	<p><i>Company 1</i> 2001: decision of implementing a QES IMS. 2003: QES IMS certification</p> <p><i>Company 2</i> 1989: ISO 9001 certification 2003: ISO 14001 certification 2005: quality and environmental management systems integration 2007: QES IMS integration</p> <p><i>Company 1</i> Top management strategic decision</p> <p><i>Company 2</i> Resources optimization Definition of a common organizational structure for three functional areas Tools, methodologies and objectives alignment</p> <p><i>Company 2</i> Different organizational structures Management subsystems specificities that were not suitable for integration High compatibility between environmental and health and safety management systems. Noticeable gap between these systems and the quality management one</p> <p><i>Company 1</i> Level (5) the management system is fully integrated allowing an easier integration with new management systems (SA 8000, ISO/ISO IEC 17025, ISO 27001,...)</p> <p><i>Company 2</i></p>	<p><i>Company 3</i> 2007: management procedures level integration, coexisting with three different certifications (quality, environment and health and safety) 2009: quality and environment integrated audit</p> <p><i>Company 3</i> Internal organization Costs reduction</p> <p><i>Company 3</i> No major difficulties had been reported because the systems integration was only documental</p> <p><i>Company 3</i> Level (1), because the company had only integrated the documental system. The processes are still managed separately</p>
Management system integration main motivations		
Management systems integration drawbacks		
Integration levels (1) Minimum level of integration		
...		

(continued)

Table II.

	HILO	LILO
(5) Full management system integration	Level (5) full integration between the environmental and health and safety management systems. Level (4) between these systems and the quality management system, because the standards requisites do not promote a higher integration level between them. In terms of organizational structure, there is a manager who is responsible for the health and safety, and environmental management system and there is a manager who is responsible for the quality management system	
Management system integration main benefits	<i>Companies 1 and 2</i> Improvement of the responsibilities definition process Better quality, environmental and safety and health processes internal organization	<i>Company 3</i> Reduction of the number of documents, thus reflecting the documental integration
Standards integration easiness	<i>Company 1</i> Level 5 all the standards are very easy to integrate	<i>Company 3</i> Level 3 usually the standards are not very difficult to integrate. However, as we have three different departments per each functional area (quality, environment and health and safety), the integration process has become very complex
(1) Very difficult integration	<i>Company 2</i> Level 4 quality and environment and health and safety standards integration	
...	Level 5 environment and health and safety standards integration	
(5) Very easy integration		

of integration did also present integration motivations that were of internal nature (Company 3) – internal organization and costs reduction.

In the organizations that achieved an effective integration two different sequences were identified: a simultaneously implementation/integration of the three subsystems (Company 1) and a sequential integration of quality, environmental and health and safety management subsystems (Company 2). Concerning the low integration level company, the first step through integration had begun in 2007, simultaneously, for the three subsystems, but only at a documental level.

Two different integration strategies have been pointed out by the organizations with a high integration level. On one hand, one of the companies had been supported by a consulting firm with knowledge and competence in the three management subsystems (Company 1). This organization had pointed out that the involvement of the consultancy company had been crucial for the integration process success. For the other company, the previous quality management system implementation and consolidation had a significant positive impact for the success of the integration process (Company 2). According to this company the quality management system existence allows the organization to adapt the methodologies and tools already used and consolidated to the newer management subsystems. The revision of the documental system, in order to verify which of the documents were considered common to the three management subsystems, was the integration strategy followed by the low integration level company. The company goal was to merge the common procedures into single documents, thus reflecting the documental integration that had been mentioned previously.

As is shown in Table II, for Company 2 the high compatibility between ISO 14001 and OHSAS 18001 standards promotes the integration process between these two management systems. On the other hand, the existence of different organizational structures for the systems management increases the level of difficulty of the integration process. Furthermore, for this company there are management subsystems specificities that were not suitable for integration and thus that create barriers for the systems integration process. Companies 1 and 3 did not report major integration difficulties.

Based on the case studies performed we were able to identify different levels of management system integration. Furthermore, we would like to point out that Company 2 stated some difficulties concerning the quality management system integration with the environmental and health and safety ones.

Companies 1 and 2 reported significant internal organizational improvements as a result of the management system integration. By the other side, for the organization with a low integration level the benefits were very limited and only of documental nature. Thus, the motivations and the organization involvement in the integration process are crucial for the resultant benefits.

The organizations with a high level of integration pointed out that its organizational performance would be inferior if the integration did not occur, namely at resources optimization. Additionally, Company 1 stated that the performance would be inferior because the company was less internally organized. Concerning Company 3, the firm performance would be similar because there would still be separated functional areas (quality, environment and health and safety) with different processes and departments.

According to the surveyed companies, ISO 14001 and OHSAS 18001 standards are easier to integrate than the integration of those standards with the ISO 9001 one.

On the other hand, the existence of different departments for each functional area increases the integration process complexity.

Conclusions

Management systems worldwide diffusion raises a set of opportunities, namely the worldwide experience and knowledge about management systems, which promotes the implementation and certification diffusion of new international standards. Nevertheless, the systems implementation may not be a management subsystems addition, but should be supported in effective management subsystems integration.

Companies should only adopt those standards that are really important, necessary and have added value for the organization processes. Additionally, when the companies' strategy is to implement more than one management system, there is a clear advantage of doing it supported on an integrated approach, avoiding the development of organizational "islands" related to each subsystem. This organizational "archipelago" structure is completely far way from any global optimized solution, based on a holistic perspective.

An IMS implementation should not be taken lightly. A careful pre-planned design should be carried out in order to the final result maximize the benefits and minimize unwanted outputs. Several requirements should be considered before, during and after an integration process. Top management commitment, resources availability, communication, and integrated training across the organization, integrated audits, technical guidelines, customers, employees and certification entities support are among those requirements. The organization complexity and the closeness between environmental and health and safety aspects with the organization core business are key-parameters for the integration success. Additionally, the integration process should take in account the organizational policy, the management style, the implemented subsystems and related systematic management, the corporation image, the market position, the organization size and the available resources.

Our research has some important limitations concerning the methodology. Methodologically we would like to point out the case studies small sample size. In the case-based research, as in other types of research methodologies, we need a sample size large enough to make some inferences and generalizations. Thus, our conclusions are very limited to our sampled companies, but we think that the real worldwide scenario is not too much different from the one which we present in this paper.

The following general main conclusions arise from the research conducted:

- Several chronological paths and sequences could be followed in order to implement an IMS. The adopted path, per se, does not restrict the integration level that would be achieved. On this subject, results arise from this study are in accordance with those reported on the literature.
- The resources optimization, the definition of an integrated management approach and the costs reduction are the main reasons that lead organizations to integrate their management subsystems.
- The quality management system could be the foundation for the integration of other management systems.
- The EMS and the OHSMS are easier to integrate with each other than with the QMS.
- HILO perceived management system integration as an added value for the organization, reporting that its organizational performance would be less efficient if integration did not take place.

Based on all information collected and analysed as a result of the case studies conducted, we are able to propose at this point the following four evolution levels in the path of the full management system integration:

- *Level I.* Documentation integration.
- *Level II.* Management tools integration.
- *Level III.* Common policies and goals.
- *Level IV.* Common organizational structure.

Based on the previous proposed framework, Company 3 is in the first level of the integration process – documental one. According to the previous integration levels, this company will evolve to the integration of management tools, followed by the definition of a common policy and goals, ending in a common organizational structure. Companies 1 and 2 are in Level IV, which corresponds to a management system fully integrated. However, it is important to point out that could exist different levels of integration for different organization functional areas.

Finally, we would like to propose a set of recommendations that could be useful for those organizations that will evolve to the integration of their management system in order to do it based on an effective and efficient way:

- Adopt a strategy supported in the processes and system approach.
- Avoid the existence of internal organizational silos.
- Adopt a unique and integrated vision, with partial divisions according to each management subsystem implemented.
- Adopt a careful pre-planned “design” that promotes flexibility.
- Assure that there is a top management commitment.
- Assure that there is resources availability.
- Enhance communication.
- Implement integrated training activities.
- Performed internal integrated audits.
- Enhance the continuous improvement approach.
- Enhance external communication among stakeholders.

Furthermore, we could state that an IMS should be supported in:

- True and sustainable top management commitment.
- Stakeholders’ involvement during the integration process.
- Organizational areas clearly identified.
- Risk assessment approach.
- Policies, programs and procedures systematization.
- Management activities should be integrated in the organizational planning.
- Top management vision as an IMS.

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Further reading

- Campos, C.A.O. and Medeiros, D.D. (2009), "Um modelo de integração de sistemas de gestão", *Produção*, Vol. 19 No. 1, pp. 70-86.

About the authors

Paulo Sampaio is Assistant Professor in the Systems and Production Department at the University of Minho Portugal. He received his doctorate in Systems and Production Engineering from the University of Minho. His research interests include quality management, ISO 9001 certification, ISO 9000 standards, and quality management systems. Paulo Sampaio is the corresponding author and can be contacted at: paulosampaio@dps.uminho.pt

Pedro Saraiva is Full Professor in the Chemical Engineering Department at the University of Coimbra, Portugal. He has a doctorate in Chemical Engineering from the Massachusetts Institute of Technology (MIT). His current research interests include strategic management, innovation, process systems engineering, applied statistics, and quality management.

Pedro Domingues is an Industrial Engineering PhD Student at the University of Minho, Portugal. His thesis is entitled "Integrated management systems: development of a methodology to evaluate systems maturity and efficiency", and is supervised by Professor Paulo Sampaio.