

BEYOND “AUDIT” DEFINITION: A FRAMEWORK PROPOSAL FOR INTEGRATED MANAGEMENT SYSTEMS

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Abstract

Oxford dictionary online defines audit as a ‘systematic review or assessment of something’. This generic definition faces a new reality due to recent management changes focusing management systems integration in organizations. A more suitable definition is provided by management standards stating that an audit is a ‘systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled’. Management systems conformity and efficiency levels assessment facing proposed goals and improvement opportunities identification are among the auditing objectives. Several articles mentioned that a study on auditing integrated management systems (IMS) should consider the historic evolution of sub-systems implementation. Several authors stated that audits have been structured to audit one management system at the time due to the lag time implementation of sub-systems. Hence, auditors have conducted auditing process on a single management system basis, which is, in our days, a narrow approach due to the ever increasing relevance of integrated management systems. ISO19011, released in 2002, was the first standard focused on auditing integrated management system providing “guidelines” to assess quality and environmental integrated system. Last standard revision was based on a more generic approach allowing the auditing of integrated systems with genesis on other standardized sub-systems. Continuous improvement philosophy common to all management systems standards is supported on several compulsory requirements, namely, top management revision, factual decision making, audits and systems (processes) approach. This paper intends to propose a novel theoretical and conceptual internal auditing framework based on the main reported synergies that could be developed under an integrated environment by the audit process and taking into account integration process genesis, namely, implementation strategy, integration level achieved, sub-systems implementation sequence and integration self awareness by the organization.

Keywords

Integrated Management Systems, internal audit, conceptual framework

1. Introduction

1.1 Overview

The word “audit”, derived from the Latin “audio” and originated with the old Roman Empire, means to listen or to question [1]. Integrated or not, management systems ‘...set the goals and objectives, outlines the strategies and tactics, develop the plans, schedules and necessary controls to run an organization’ [2]. Under an integrated management approach organizations have the responsibility to ensure that their operations are carried out in a safe and productive manner, reducing the potential negative impacts to people, property or environment. A structure for an IMS satisfying two major requirements has been proposed assuring compliance with requirements of ISO management systems standards and UK Audit Practices Board for internal control requirements [3]. Wisely, several authors stated that ‘...the simple action of implementing management systems does not guarantee that the organizations will improve performance’ [2]. This is true for integrated management systems too. Potential benefits and resistances to management systems integration have been reported in several publications [4-13]. Some authors [14] highlight the main activities developed by a new kind of professionals, the so called, Quality, Environment and Health and Safety (QEHS) professionals:

- To integrate common sections of the three standards.
- To develop EHSMS and Quality manuals/QEHS policy, documentation, objectives, etc.
- To link EHSMS internal audits with internal compliance audit program.

From the above-mentioned, one activity deals with organizational procedures adjustment, other with documentation and the latter with internal audits. This fact highlights the relative importance of the audit (internal and external) process under an organizational integrated environment. Several sources suggest reference matrices to structure the documentation [15]. Strategies to integrate common sections of sub-systems standards are well reported in literature [16]. The reported approaches to deal with audits under an integrated environment are somewhat diffuses, misleading management systems responsible willing to implement the best available solution.

1.2 Management Systems Audits: literature review

Literature on internal and external audits under an integrated approach is scarce [17]. Among the benefits arisen from audits integration are the costs and time savings by the frequency reduction of internal audits, redundancy reduction and decrease in external certification costs due to single certification audits leading to an increase in profit margins and the establishment of auditor competence for different management systems [2, 17]. The high costs of certification/verification procedures and the effort duplication between certifiers/verifiers and internal auditors were the main resistances to integration related to audit process reported by several studies [2]. Audit methodologies, namely “requirement-by-requirement” and “process-by-process”, have been outlined by several authors being emphasized the effectiveness of the latter [18]. There are several guidance documents to assist auditors/verifiers through the audit process focusing management sub-systems. ISO 10011 series (Guidelines for auditing quality systems) and ISO 14010/11/12 (Guidelines for auditing environmental management systems) are among those documents. Different industrial sectors issued their own standards and checklists as IPC- Safety Audit focusing OH&S assessment on connecting electronics industries and checklist for an audit of safety management. Internationally, the brightest beacon on this subject is the ISO 19011 standard for quality management systems (QMS and environmental management systems (EMS)). Due to similarities among management systems standards, ISO 19011 may provide some help auditing other management sub-systems than EMS and QMS [17]. According to [17] there still are some unanswered questions related to integrated audits subject:

- ‘How do organizations realize the audits of their standardized management systems?’
- ‘Do they integrate the audits against QMS, EMS and other management systems?’

Other unanswered questions could be added to these, focusing IMS:

- In an integrated environment, audit execution should be performed through a “process-by-process” approach or “requirement-by-requirement” approach?
- Should audit frequency be increased or decreased under an IMS?
- Which audit strategy best fits under an integrated management approach (Figure 1)?

- Which new resources should be provided to audit IMS?
- Should audit plans and reports be changed focusing new stakeholders?
- What about the audit team? What would be the common “language” or integrating factor to consider in order achieving homogeneous outputs?
- Should auditors know previously why an organization integrated its management sub-systems as stated by several authors [19]?
- Does the adopted approach (“all in” or “step by step”) during integration process should be considered on the audit process?
- Several authors stated that auditors are responsible for correct implementation of the standards [18]. What should be the audit approach if there is not an IMS implementation standard?
- Size really matters? Does company size should influence audit approach by the audit team?
- Evolution from a low level integration level to a high level integration level is not a ‘quantum leap’. What about those organizations with some of their processes integrated? Should the audit methodology be the same for integrated and non-integrated processes?

Four types of integrated or combined audits may be distinguished as shown in figure 1 [19]:

- Integrated.
- Simultaneous.
- Overlapping.
- Sequential.

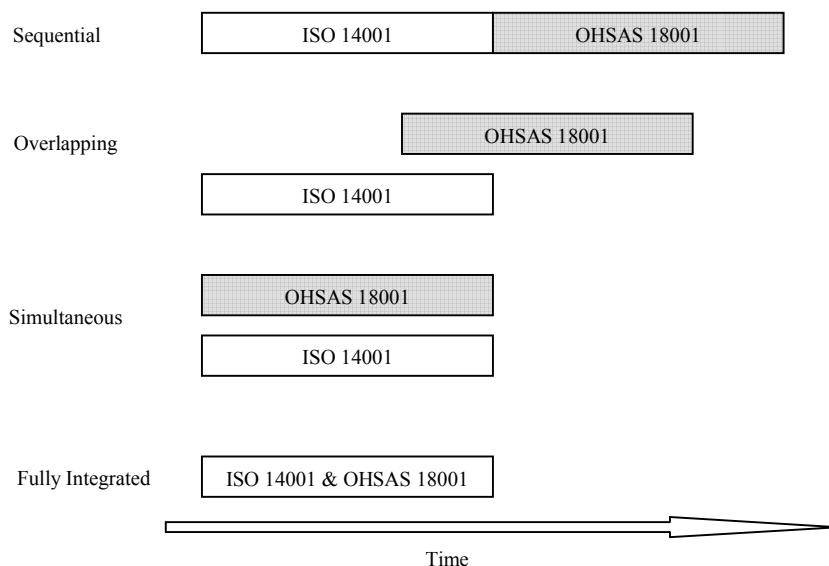


Figure 1: Combined audits (adapted from [19])

Common elements and language makes combined audits easier [14]. All management sub-systems reported in IMS studies share the same structure, so after implementation, it is taken for granted that common elements will be present. A common language implies that an integrating concept should bridge the management sub-systems. Several integrating factors have been proposed, namely, risk approach, continuous improvement and sustainability [20].

Audit effectiveness has been highlighted by several authors despite the fact that available reported studies focus a unique management sub-system. As an example, to be effective an OHS audit will need to [20]:

- Identify possible risk situations.
- Assess the potential hazards associated with these risks.
- Select measures to minimize such risks.
- Implement safety measures and monitor management control systems.

Several authors argued that the above-mentioned could be extended to quality and environment management systems suggesting a risk model approach to integrate management systems, hence, audits to integrated management system [20].

The processes covered in the integrated system may include the items described in table 1 [11]:

Table 1: Processes covered in IMS (adapted from [11])

Processes	
<ul style="list-style-type: none"> . Management responsibilities; . Definition and communication of the policy statement; . Definition and communication of objectives, targets and goals; . Definition of responsibilities and authorities; . Provision of adequate resources; . Management reviews; . Documental control; . Record control; . Employee training; . Definition and review of customer requirements; . Identification of legal and regulatory requirements; 	<ul style="list-style-type: none"> . Control of design and development; . Control of manufacturing and service provisions; . Identification of environmental aspects and impacts; . Hazard identification and risk analysis; . Emergency preparedness and response; . Product monitoring and measurement; . Instrument calibration; . Purchasing; . Internal audits; . Control of non conformity product. . Measurement of customer satisfaction; . Corrective and preventive actions;

The same authors concluded that organizations wanting to integrate their audit processes should develop an audit schedule based on their processes emphasizing and favoring the “process by process” approach over the “requirement by requirement approach”. Later, on the same article the authors suggest that integrated audits should be performed on integrated processes and parallel audits performed on non-integrated ones. A study among Spanish organizations aiming to evaluate audit integration level concluded that internal audits are integrated at higher level than the external audits [17].

Several authors proposed audits framework, being a well known proposal focusing IMS specifically (Figure 2) [22]. A related concept, the universal audit concept, was developed by the same authors (Figure 3).

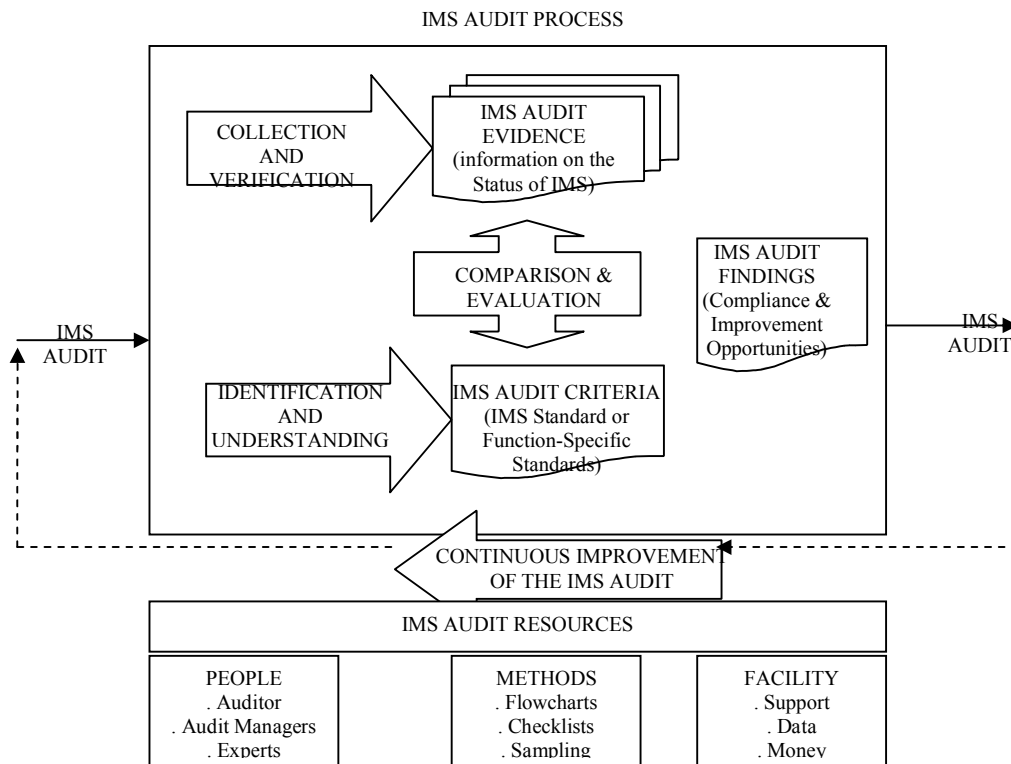


Figure 2: IMS Audit Framework (adapted from [22])

The universal audit concept widens the audit scope proposing an interrelated approach among several elements conditioning the organization performance, being the management(s) system(s) one of the elements to be focused.

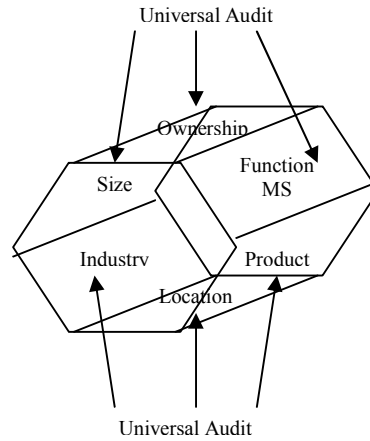


Figure 3: Universal audit concept

The audit scope, namely, physical location, organizational units, activities and processes define the extent and boundaries of an audit. In an integrated environment the audit scope is a critical point to be considered since precise and defined boundaries are no longer available. An audit model was developed for integrated EMS and OHS based on a performance guide [23]. Divided in three chapters (SHE-General, Health and Environment), this performance guide may be used by companies according to the audit scope. As an example, a company intending to audit specifically EMS will follow items for chapter 1 (SHE-General) and chapter 2 (Environment). Audit proved herself as a good indicator to assess management systems efficiency and effectiveness and ‘...can and should be instrumental in identifying problem areas and potential improvements, along with corrective and preventive actions.’ [24]. A central point in systems management is the audit as diagnose, maintenance and improvement tool. Combined audits have been suggested as a preliminary step to future integrated audits [24]. The same authors pointed out that auditors should embrace a more prominent consulting approach in this preliminary phase effectively helping IMS development. The main characteristics that an auditor should assume and resources needed are depicted in table 2:

Table 2: IMS audit resources (adapted from [24])

Phase 1: IMS development/implementation	Phase 2: After IMS implementation
Recognized guidelines for IMS implementation	A continuous improvement approach should be adopted by the audit team
Publications and internal resources that may aid auditors training	Information technology resources should be available
Workshops and seminars	Auditors continuous training
Documentation structure should allow audits by different entities with different purposes and criteria	Self assessment promotion
Cooperation between management consultants and technical experts before and after audits	Cooperation between internal and external auditors in order to improve improvement opportunities detection
To understand and accept some risks during IMS development	Seek for IMS continuous improvement
“Checklists” and special assessment criteria	System certification (if possible)
“Follow-up” meetings with top management and auditees discussing audit process, results and further improvements	
Cooperation and pro-activeness between audit team, auditees and top management	
External audits to assess IMS implementation terminus	

2. IMS Conceptual Framework Proposal

2.1 Objectives, Policy and Vision

One of the QMS eight principles states that an organization should promote mutually advantageous relations to suppliers. In integrated management environment objectives, policy and vision should be adjusted ensuring that mutually advantageous relations should be developed with stakeholders, namely, suppliers, clients, employees and society. On this subject, it has been stated that ‘Organizations and companies become increasingly dependent on each other and foreign partners in business, prosperity, socio-economic change and environment responsibility’ [18]. It is expectable and advisable that advantageous relations be developed within the IMS itself, that is, management sub-systems should enhance and promote “miscibility” among them. Caution is advised on this concept. Several management standards requirements are inherently less “miscible”. As an example, a non conformity consequences ascribed to the quality sub-process is placed on a different level related to non-conformity consequences related to the OHSMS. Despite of this, procedures describing detection, handling and corrective actions may be similar. This rather diffuse nature concerning IMS should be handled wisely being focused on item 2.3 of this paper (“Interactions” assessment).

2.2 Lead Auditor: role and profile

The role that the lead auditor could play when auditing an IMS is of utmost importance. Usually the lead auditor should be someone with a deep knowledge upon the standard to be assessed, a wider professional experience and personal leading skills. IMS audit requires all these features and adds more. One reported pitfall to avoid when integrating internal audits is to force audit integration on processes that have not been integrated. The assessment of which processes are integrated and which processes are not integrated should fall under the lead auditor responsibilities. As mentioned earlier, a common “language” should be present. The lead auditor should assess if communication is coherent between the different integrated sub-systems. The audit team should provide the lead auditor evidences of this feature. Key inputs and resources definition for each process to be reviewed using documentation, flowcharts or diagrams is, under an integrated context, a huge task. It seems that, more than a defined virtual super-profile, a conceptual revision on leadership should be put on the agenda.

2.3 “Interactions” assessment

An IMS originates interactions among different management systems. This fact and the management of several issues at the same time with the need to balance different objectives, the so-called holistic approach, are the main characteristics of an IMS. In fact, the actions to be taken in order to implement, develop and run different management sub-systems are purposely similar since all are based in the Deming cycle. Hence, an IMS add interactions to the organizational structure. Interactions assessment among management sub-systems (organizational “shear”), should be taken into account by organizations and by auditors/verifiers. All management systems community should be focus on providing and developing a “tool” in order to assess these “interactions”. Like in other systems, interactions are “more than eyes can see”. Diffuse in nature, certainly quantifiable, “interactions” assessment would provide a deeper and precise knowledge on issues like maturity and efficiency IMS levels. Comparable to Newton’s work regarding celestial bodies, management systems “interactions” assessment relies, in our days, on a suitable expertise network (academics, industry experts, certification bodies experts, auditors) dispersing the task burden. Regarding to this feature and in an inspirational context, someone said once ‘Now is time to leave the capsule, if you dare’ [25].

2.4 Audit team

It is known that every transformation, besides the desirable output, originates undesirable or no value outputs. If we recall basic chemistry, it is still present the concept of reaction yield and sub-products from a chemistry reaction. Management systems integration, being an organizational transformation produces organizational waste such as non-value added activities [18] that should be focused by the audit team adopting a lean philosophy. Other subject pointed out in literature regarding the audit team is the use of internal auditors who do not have the appropriate expertise/competencies in sub-systems covered by the audit scope being this fact a major pitfall [11]. As mentioned on section 2.2, it is advisable that audit team assess that, at least, one integrating concept is present across the organizational structure and report this fact to auditor-coordinator.

2.5 IMS Audit Outputs

Coherently, the audit report should provide integrated evidences using the common “language” adopted in the organization. Improvement opportunities, identified by the audit team, should be integrated in nature considering all sub-systems objectives. Due to this fact, the possible array of viable solutions narrows. Constraints increment increases difficulty to achieve consensual solutions comparing to non-integrated management systems, being precise and accurate descriptions of improvement opportunities a potential add value on the IMS audit report.

2.6 Conceptual Framework

According to the above-mentioned, figure 4 illustrates the dynamics of the proposed conceptual audit framework. The lead auditor plays a critical role. The audit team should provide to the lead auditor source information concerning processes that are not integrated, no value added activities generated from integration, which integrating factor or concept merges sub-systems and if that concept enables an effective common language. Management systems integration arouses interactions. As in other systems, in other scientific fields, those interactions should be assessed and quantified. Traditional management indicators evaluate actions. New indicators should be developed focusing the assessment of the, currently, diffuse concept of interactions. Audit team should check that organization policy, objectives and vision are aligned and enhancing mutual advantageous relationships between integrated management subsystems.

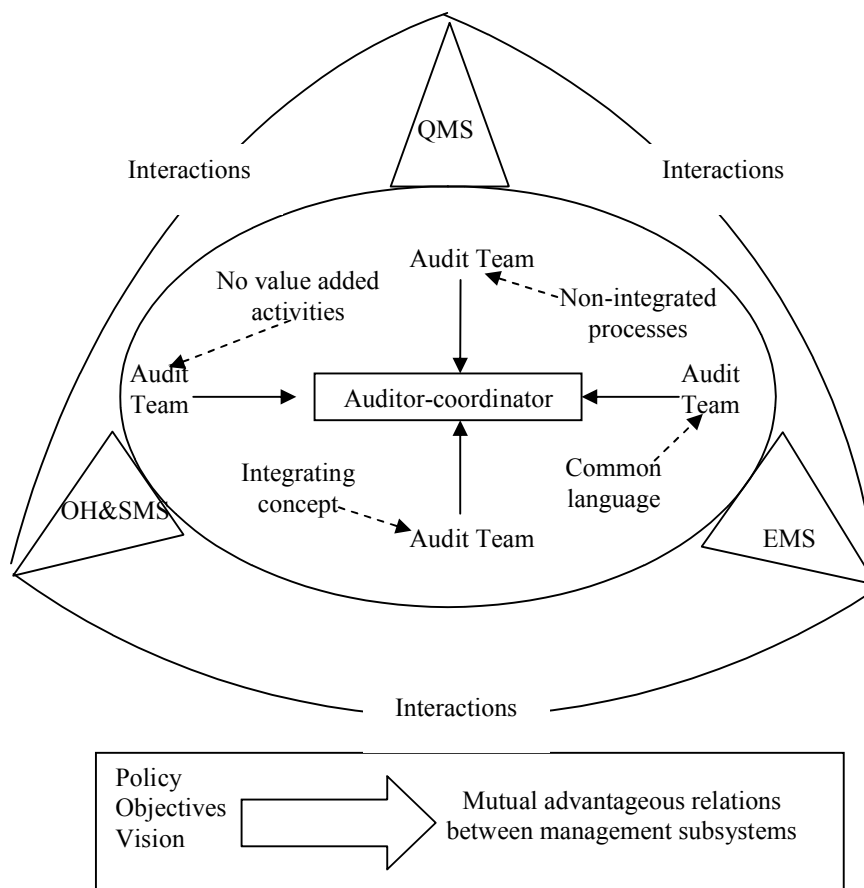


Figure 4: Proposed conceptual framework

3. Final Remarks

Management systems integration adds two major features regarding the traditional non-integrated approach: the development of “interactions” between sub-systems and the fulfillment of several objectives at the same time, the so-called holistic approach. It is likely that any audit framework, model, checklist, tool or guidelines that do not embrace and contemplate these new IMS features will not achieve the purpose that it was created for. In order to

accurately modeling and assess an IMS, management systems community should provide organizations with a tool enabling the “interactions” measurement. Audit process plays a critical role through the IMS implementation, development and continuous improvement since it provides middle and top management with information regarding the integration level achieved, the integrated and non-integrated processes and improvement opportunities.

Acknowledgements

Acknowledgements are due to Bosch Car Multimedia Systems Corporation, Delphi Corporation and to the anonymous reviewers for their comments and suggestions on this manuscript.

References

1. Kraus, J. L. and Platkus, W., 2007, “Incorporating continuous improvement principles into EMS auditing strategies”, *Environmental Quality Management*, Summer, 7-12.
2. Suditu, C., 2007, “Positive and negative aspects regarding the implementation of an integrated Quality- Environmental-Health and Safety Management System”, *Annals of the Oradea University*, VI/XVI, 2013-2017.
3. Brewer, D., Nash, M. and List, W., 2005, “Exploiting an Integrated Management System”, *Gamma Secure Systems Limited & Co.*
4. Saraiva, P., Sampaio, P., 2010, “Integração de Sistemas de Gestão da Qualidade, Ambiente, Segurança e Higiene do Trabalho,” *Proceedings of SHO 2010*, 23-28.
5. Sampaio, P., Saraiva, P. and Rodrigues, A. G., 2008, “ISO 9001 audits: a classification algorithm”, *ASQ World Conference on Quality and Improvement*, Houston, Texas, USA.
6. Winder, C., 2000, “Integrating OHS, Environmental, and Quality Management Standards”, *Quality Assurance*, 8, 105-135.
7. Zeng, S. X., Tian, P., Shi, J.J., 2005, “Implementing integration of ISO 9001 and ISO for construction”, *Managerial Auditing Journal*, 20(4), 394-407.
8. Quality Associates, 2010. (Internet)
9. Arifin, K., Aiyub, K., Awang, A., Jahi, J., Iteng, R., 2009, “Implementation of Integrated Management System in Malaysia: The level of Organization’s understanding and awareness,” *European Journal of Scientific Research*, 31(2), 188-195.
10. Filho, O. M. and Souza, L. G. M., 2006, “Restrições técnicas associadas a um sistema integrado de gestão: estudo de caso em uma empresa,” *Proceedings of XXVI ENEGEP*, Fortaleza, CE, Brasil.
11. McDonald, M., Mors, T.A. and Phillips, A., 2003, “Management Systems Integration: Can it be done?,” *Quality Progress*, October, 67-74.
12. Domingues, J. P. T., Sampaio, P. and Arezes, P. M., 2010, “Integrated Management Systems: a synergistic approach,” *Proceedings of 13th Toulon-Verona Conference*, Coimbra, Portugal.
13. Domingues, J. P. T., Sampaio, P. and Arezes, P. M., 2011, “Integrated Management Systems: The vision from the perspective of the OH&SMS,” *Proceedings of SHO 2011*, Guimarães, Portugal.
14. Bourcier, D., Tibert, L. and Trappen, W., 2007, “Integrated management systems audits: internal audit tool,” *Presentation at American Industrial Hygiene Conference*, June 5, Philadelphia, PA.
15. Heinloth, S., y.u, “Integrated Management Systems Category: Leading edge,” *ASQ 53rd Annual Quality Congress Proceedings*.
16. Sampaio, P., Saraiva, P., Rodrigues, A. G., 2008, “Sistemas de Gestão: Da Qualidade para outros sistemas,” *Proceedings of SHO 2008*, 273-279.
17. Bernardo, M., Casadesus, Karapetrovic, S. and Heras, I., 2009, “An empirical study on the integration of management systems audits,” *Journal of Cleaner Production*, 18, 486-495.
18. Kaziliunas, A., 2008, “Problems of auditing using Quality Management Systems for sustainable development of organizations,” *Baltic Journal on Sustainability*, 14(1), 64-75.
19. Kraus, J. L. and Grosskopf, J., 2008, “Auditing integrated management systems: Considerations and practice types”, *Environmental Quality Management*, Winter, 7-16.
20. Labodová, A., 2004, “Implementing integrated management systems using risk analysis based approach,” *Journal of Cleaner Production*, 12, 571-580.
21. Aziz, B., 1993, “The effective management of Occupational Health and Safety: The requirements for accreditation for quality in the health services,” *International Journal of Health Care Quality Assurance*, 6(5), 30-32.
22. Karapetrovic, S., Wilborn, W., 2001, “Audit systems: concepts and practices,” *Total Quality Management*, 12/1, 13-28.
23. Jacobsson, A., y.u, “Integrated SHE management/ auditing systems- Practical Guidelines (especially for SME’s).”
24. Beckmerhagen, I. A., Berg, H. P., Karapetrovic, S. V. and Willborn, W. O., 2003, “Auditing in support of the integration of management systems: a case from the nuclear industry,” *Managerial Auditing Journal*, 18(6/7), 560-568.
25. Bowie, D. (1969). “Space Oddity” .Space Oddity. Philips edts.