

Evaluation of Maturity Level of QSE Management Systems: Empirical Analysis, Case of Moroccan Companies

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Received: August 12, 2015

Accepted: October 13, 2015

Online Published: February 4, 2016

doi:10.5539/mas.v10n5p10

URL: <http://dx.doi.org/10.5539/mas.v10n5p10>

Abstract

Nowadays, the adoption of management systems dedicated to quality, environment and safety in company have become real issues, a competitive argument. They also have a reputation and international recognition. For some companies, they become like a prerequisite for their proper development. The aims of this paper is to understand how the Moroccan organizations who have an Integrated Management System integrate their management systems and the way that they perceive the challenges of managing several management systems in parallel over time. According to a survey carried out with thirty four Moroccan firms, we analyze empirically the implementation of different MSs such as: ISO 9001, ISO 14001 and OHSAS 18001. Specially, we evaluate the integration levels of different management systems elements such as humans and documentation resources, objectives, procedures and audit. We analyze also the perceptions of companies about the advantages and the challenges encountered into the integration of Management Systems in organizations with more than one Management system.

Keywords: quality, safety, environment, integrated management Systems (IMS), Morocco, management system standards (MSs)

1. Introduction

In last few years, industrial companies are obligated to adapt to a changing environment. Among these obligations, the company has to meet the product quality/process requirements, security of employees, protection of the environment and improve productivity. Therefore, quality, safety and environment systems, often called QSE, are the main concern related to the optimization of production. Indeed, the implementation of the integrated management system offers companies the ability to control the risks, costs, environmental impacts, non-conformities and satisfy customers through an approach for improvement continues.

In the literature, many researchers have been performed to study the manner in which firms have discussed the implementation and integration of quality management systems (QMS) with environment management systems (EMS) and occupation health and safety management systems (OHSMS) (Glen Douglas, 2000; Karapetrovic et al., 2006; Engelhardt & Fresner, 2004; Jørgensen et al., 2006; Labodova, 2004; Zutshi & Sohal, 2005; Zeng et al., 2007; Salomone, 2008; Wilkinson & Dale, 2000; Khanna et al., 2010; Simon et al., 2012), the number of firms with more than one MS is increasing constant and lot of them already have experience with integration. In addition, certain countries, such as: France, Spain, Holland, Australia, Denmark and Britain have begun to develop national standards for IMS.

Our contribution Consists to analyze empirically the implementation of integrated management systems (IMS) such as: ISO 9001, ISO 14001 and OSHAS 18001 by Moroccan organizations. The various aspects of integration and the perceptions of companies about the benefits of implementing IMS are analyzed. Also the effects of integration on firms, namely the difficulties encountered by companies into the integration of their standardized MSs are examined.

1.1 Integration Management System

The topic of IMS of quality, environment and health and safety management is more and more regarded as part of the organization's portfolio (Wilkinson & Dale, 2000). It combines the requirements of different standards mutually compatible (ISO 9001 for Quality, OHSAS 18001 for Safety at Work, ISO 14001 for Environment) so

that the organization becomes more efficient. It's considered a unique range of interrelated process who share a single group of technical, human, information and financial resources in order to attain objectives related to the satisfaction all of stakeholders. The major challenge of an IMS is to lead the organization in a progress and performance approach, avoiding duplication, by conducting a policy for the prevention and control of risks, but also reducing the costs of implementation and monitoring of the various management systems and finally to be beneficial for all stakeholders (civil society, environment, personnel).

In fact, the integrated management system is increasingly recognized, as organizations find it more interesting to integrate their management systems instead of managing them independently (Douglas and Glen 2000; Karapetrovic and al, 2006; Zeng and al. 2007). In the meantime, there has been a increasing gratitude of the value witch integrated management systems can bring to the firms (Wilkinson & Dale, 2000; Douglas & Glen, 2000; Zutshi & Sohal, 2005; Salomone, 2008; Khanna, 2010; Asif et al., 2010). So, they often include common items such as, control of documents and records, internal audits, corrective and preventive actions, review of the management and continuous improvement. Today, numerous businesses are implementing different management systems not just to satisfy the standards requirements, but to combine the work with efficiently and effectively.

2. Methodology of Search

A good understanding of the organization environment remains fundamental for its development. It is important to ensure both a good command of information and continuous monitoring of competition in order to provide industrial changes at large. The study was conducted via an empirical investigation, using a structured personal interview, based on a closed questionnaire with multiples choice and a set of open questions that permitted us to clarify certain points, to trace the essential nature of information to allow evaluation of the integration level, to identify different aspects of strengths and weaknesses, the opportunities and threats in the enterprise. The questionnaire has been elaborated on the basis of a literature review (Asif, 2008; Douglas & Glen, 2000; Fresner& Engelhardt, 2004; Khanna et al., 2010; Jørgensen et al., 2005; Karapetrovic et al., 2006 ; Simon et al., 2012; Wilkinson&Dale, 2000; Zeng et al., 2007;Zutshi et al., 2005).

In this way, the process started with a pilot test, which permitted us, to modify the initial questionnaire, to ensure that the questions were properly phrased, and the pertinence of the questionnaire was tested on a sample of firms, then we conducted the interviews with 50 firms of different sizes and activities Sectors (chemical, mechanical, electronic, agriculture ...) that agreed to participate. The Selected companies are at least certified according to ISO 9001 and must be interested with the QSE systems. However, only 34 interviews were considered because the others provided incomplete data. The survey therefore had a 68% response rate. In order that the diagnosis is complete and efficient, it must first target persons which will be submitted the questionnaire. Our survey was answered by the persons in charge of the quality, safety and environment area (supervisors, animators and representatives of managements systems), for these reasons:

- These persons represent an active role in the QSE strategy;
- They possess the knowledge required to answer the questionnaire, and given their knowledge and training on the subject, this would permit a better understanding of the questions;

3. Results and Discuss

The principal characteristics of samples from the investigations are discussed such as the number of employees, the size and the industries sectors of organizations to which belong such firms.

3.1 Effective Business

The distribution of companies interviewed based on their effective of employees gives the following results (Figure1). In terms of numbers of staff, the most of the firms (41%) having between 50 and 199 employees, the total of 21% of firms having between 200 and 499 employees, the number of organizations having more than 500 employees was 29%.

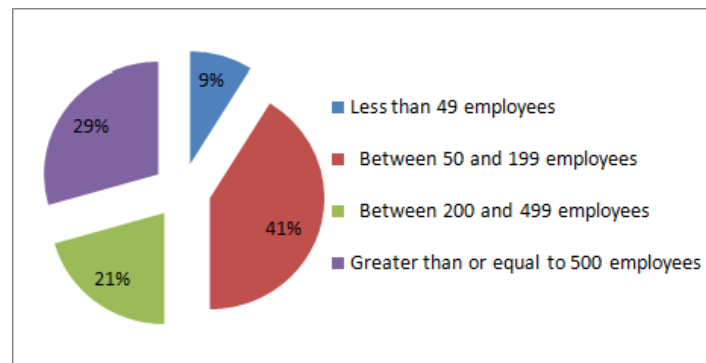


Figure 1. Numbers of employees in Surveyed firms

3.2 Turnover of Businesses

To better define the size of the company, the questionnaire also addresses the distribution of turnover (Figure 2), 68% of companies having a higher turnover to 100 million dirham's, a result which corresponds to the number of large companies interviewed (50% have a number superior to 200 employees).

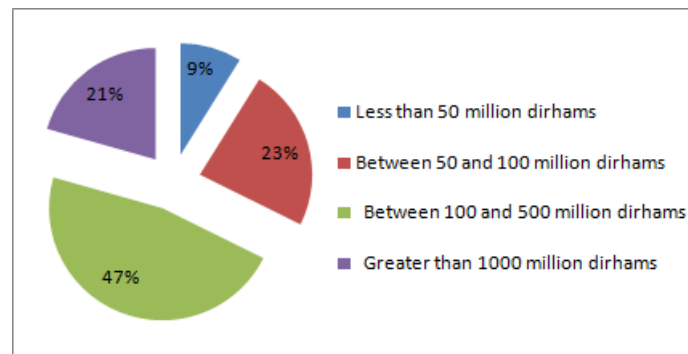


Figure 2. Turnover of the Organizations

3.3 Industry Sectors

The companies surveyed belong to several sectors, the dominant sectors are in full development in Morocco. Figure 3 gives more details:

- The chemical sector is dominated by (23.52%), whose activities are organically linked to several industrial activities, namely the activities of OCP Group (phosphates and fertilizers), petrochemistry, pharmaceutical and cosmetic products.
- The Electronics electrical and energetic industry is indicated by 20.58%, because it is represented by various multinational companies operating in this field in Morocco
- The 14.7% of respondents for each sector, agribusiness because Morocco is a primarily agricultural country, And the Mechanical Manufacturing and Aerospace, who knows a great development nationwide.

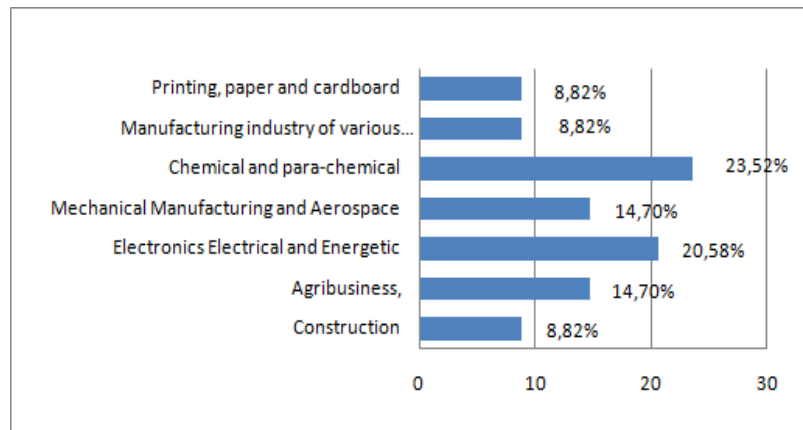


Figure 3. Industry Sectors of the Surveyed Organizations

3.4 Implementation of Standards

During the study, only companies which are at least ISO certified 9001 have been the subject of a sampling, the 34 companies that have been accepted, show selected certifications mentioned by the figure after (Figure 4):

The three certifications are dominating ISO 9001, ISO 14001 and OHSAS 18001, 100% of companies are certified according to ISO 9001, while the ISO 14001 represent 64.70% and OHSAS 18001 represent a rate of 38.23%.

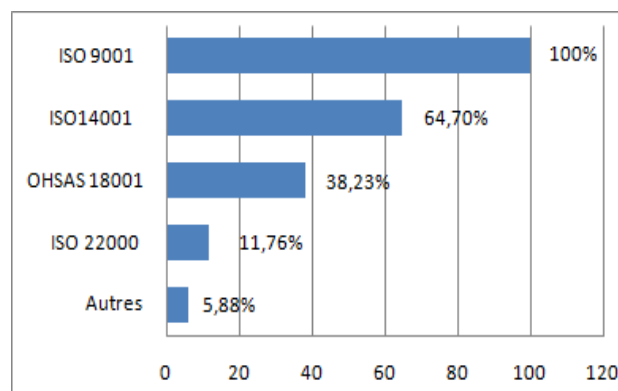


Figure 4. Implementation of the standards

3.5 Evaluation of Integration Levels of Various Aspects of IMS

3.5.1 Integration Levels of the MSs

Three levels of integration were discussed by the survey, total integration (the different systems are interconnected in a single global management system), partial integration (there are common areas and shared between these systems eg: procedures, instructions ...) or the non-integration (systems are managed separately without any connection between them) management of systems by Moroccan companies:

The figure 5 shows that the companies compliant with multiple MSs and perceiving the benefits of integration chose full integration (32.35%), while businesses that have possibly encountered or expected the difficulties of integration prefer to keep their management systems separate (23.52%). A majority of companies remain in a average position with a partial integration level of (44.11%). It is essential to clarify the reasons that prevent these companies not to engage in the way of integration of their management systems, which will be specified later.

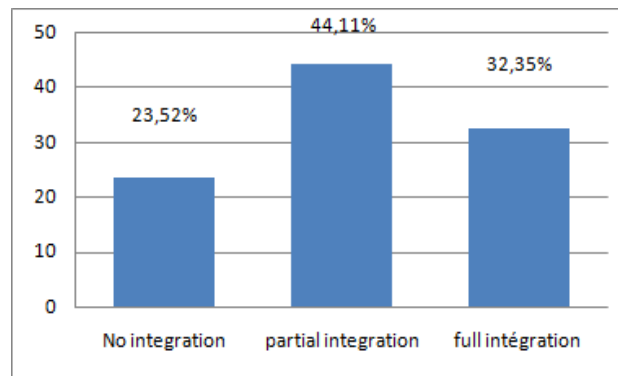


Figure 5. Integration levels

3.5.2 Tools and Models Used for Integration

Companies resort to different tools and models during the integration of their MSs, the investigation revealed the use of PDCA, process map, , specific models to the company, and if organizations have conducted an analysis of common elements of MSs.

The results indicate the method of the analysis of common standards (Figure 6). dominated and has been used by 38.23%. Then, process map is the second most tool commonly exploited by companies to integrate their management systems by 32.35%. Moreover, 17.64% of companies used their own model, while 11.76% used the PDCA approach.

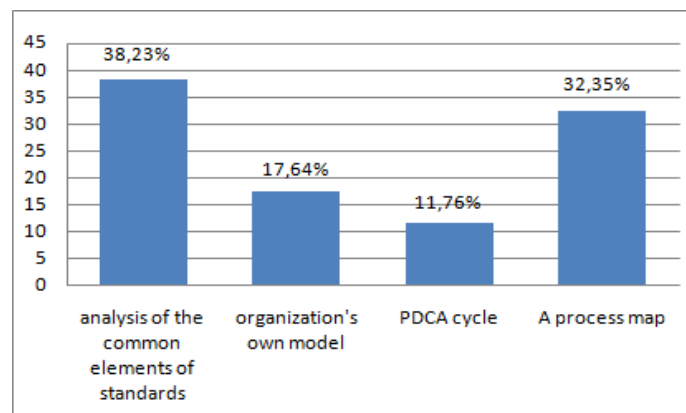


Figure 6. Tools and methods used in the integration

3.5.3 Integration of Human Resources

The survey treated the degree of involvement of the human resources implicated in the management of different systems, to know if the responsibility for the management of IMS returns to the same individuals in the company or at different persons (Karapetrovic and al., 2006). This was discussed on three levels of responsibility in the business: top management, animators or representatives and inspectors of management of different systems.

Figure 7 illustrates, that the level of integration of management system representative represent 41, 17%, as well as, 38,23% for management system managers, and the 20,58% for the inspector integration level. However, the results show also that the level of integration is significantly higher at the high direction rather than at the workshop. This is likely demonstrated by the fact that representatives of MSs are recruited and engaged for managing the IMS.

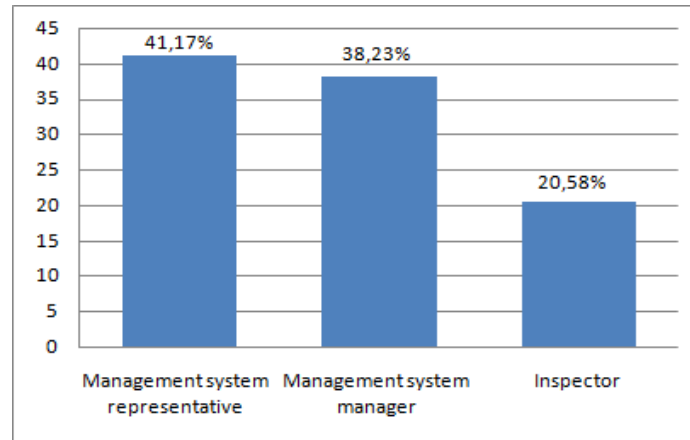


Figure 7. Integration of human resources implicated in the different MSs

3.5.4 Integration of Documentary Resources

In terms of integration of documentary resources, we examined the integration levels of objectives, policy, procedure, manual, records and instructions (Karapetrovic et al., 2006).

The results indicate (Figure 8) a high level of integration at policy, objectives, the manual, and procedures. However, we observed that aspects such as utilization of integrated records, instructions, seemed to be integrated to a lesser degree.

Of all respondents, 76.46% (26) said they had integrated certain aspects of their MSs. Areas where integration has occurred are presented in Figure 8. Of the 26 organizations who have integrated their systems to certain degree, 15 (44.11%) had a defined common policy and goals, 11 (32.35%) had developed a unique manual and procedures that include three management systems. The rest of companies 8 (23.52%) who have chosen to separate their management systems documentation.

Listed a number of reasons for that, including:

- Reduction in verification time and keeping them separated.
- External approbation was required for certain specific documents.
- ISO 14001 and OHSAS 18001 were still new and not applied to all areas of the organization which operated the ISO 9000.
- It is too soon to evaluate the IMS.
- All procedures are not common to all systems.
- Not enough common ground between the three standards

A large majority of all companies respondents 76.46% (26) considered that the reaction of their certifications bodies to the possible integration of their management system has been positive and, in some cases, integration was actively encouraged.

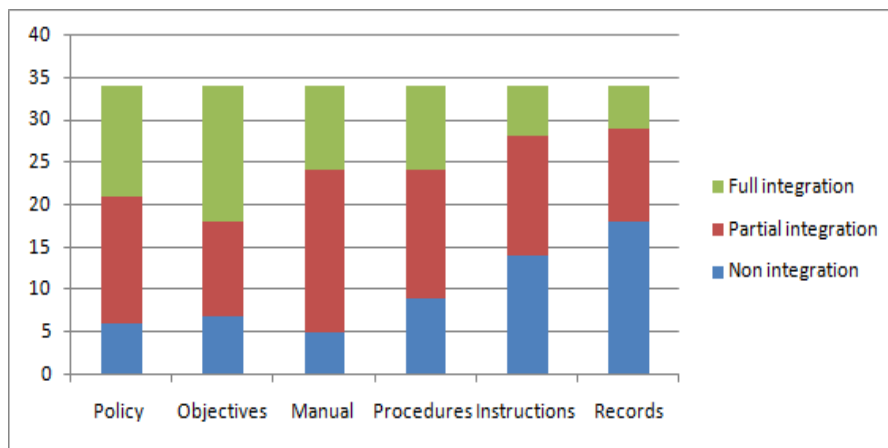


Figure 8. Integration of documentation and objectives

3.5.5 Integration of Procedures

Additionally to the documentary integration, we examined precisely the integration of various proceedings for the activities such as, checking and review of management, control process and document and determination of stakeholder requirements. As in Karapetrovic et al. (2006). The following figure 9 illustrates a Higher levels of integration were examined in MS procedures, such as internal communication, preventive and corrective actions, internal Audit and systems improvement. While the elements integrated to a lesser extent were the non conformities control, product realization and requirements improvement. In general, all the procedures have interesting integration levels for the majority of the firms.

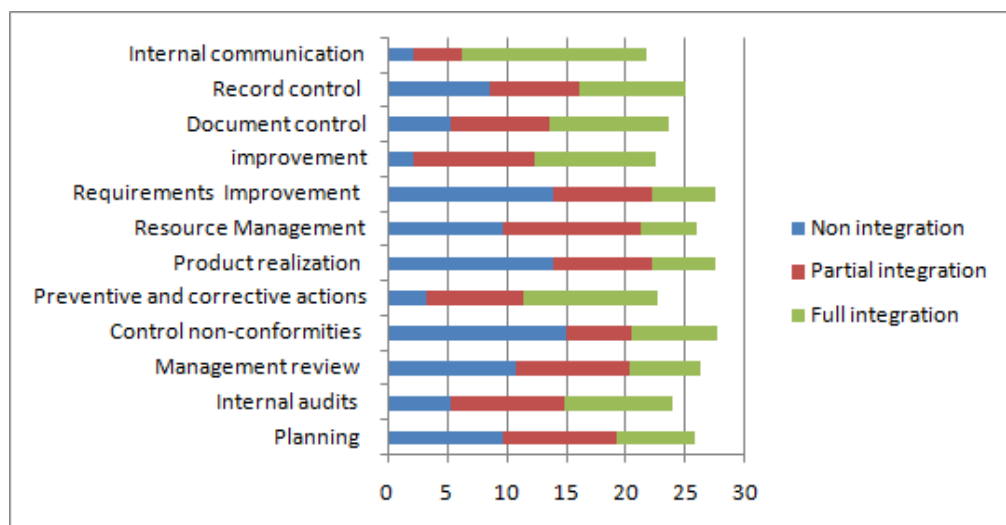


Figure 9. Integration of procedures

3.5.6 Integration of Audit

The organizations has integrated some aspects of the audit systems, such as, human resources and time, they has obtained for integration of internal audits and even requires the integration of external audits, view the numerous advantages and efficiency gains related to the integration of audits. For example, the optimized use of resources and the establishment of auditors competencies for different MSSs.

A large majority of surveyed business conducted internal and external audits by the same auditors (67,54%) and almost in a simultaneous manner (53,12%) for all MSs implemented. Only about (12,5%) of organizations used distinct audits for each system at different times. (Figure 10)

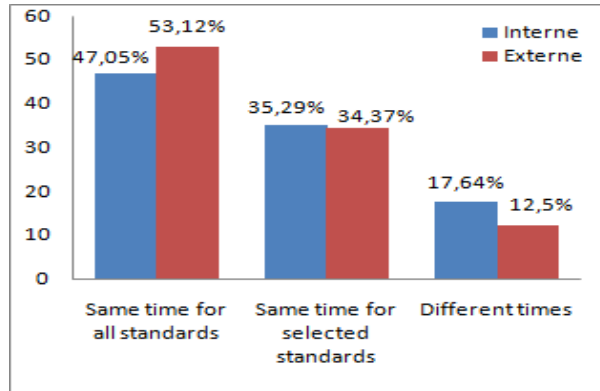


Figure10. Integration related to the audit time

A similarly degree of integration of audit teams appears to have been reached for the majority of businesses (Figure 11).

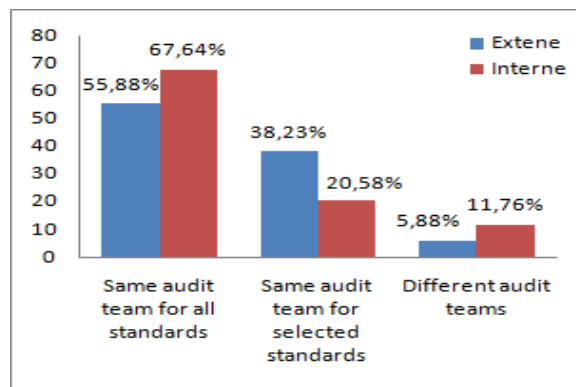


Figure11. Integration related to the audit team

3.6 Benefits of Adopting an Integrated Management System

There have been numerous studies that interrogate on the organizations drivers for the certification of different management systems, their experiences with implementation and the advantages obtained. Numerous advantages and gains efficiencies are related to the integration of MSs. For example, (Douglas G., 2000; Zutshi & Sohal, 2005; Wilkinson & Dale, 2000; Asif et al., 2010; Karapetrovič, 2006; Salomone, 2008; Khanna, 2010; Simon et al., 2011) demonstrate the improvements linked to getting an integrated system such as cost savings, operational advantages, better external image, improved customer satisfaction and increased employee motivation.

Figure 12 shows that integration has brought positive impacts for most Moroccan firms that comply with the requirements of the implementation of management systems. We can deduce that companies are in favor of the integration of their management systems. Some of the positives are:

The (82.72%) of businesses voted for a gain of better corporate image, following by the desire to improve the efficiency of the company with a importance level of (80.08%), the (78.32%) of companies have a commitment to ensuring a global control of management system, a control which ensure the efficacy and the efficiency of activities undertaken. 74.80% of companies have voted for better use of Results of audits, especially as the organizations majorities have opted for total integration of internal and external audits, it reduces the cost of stakeholders, and gain the time.

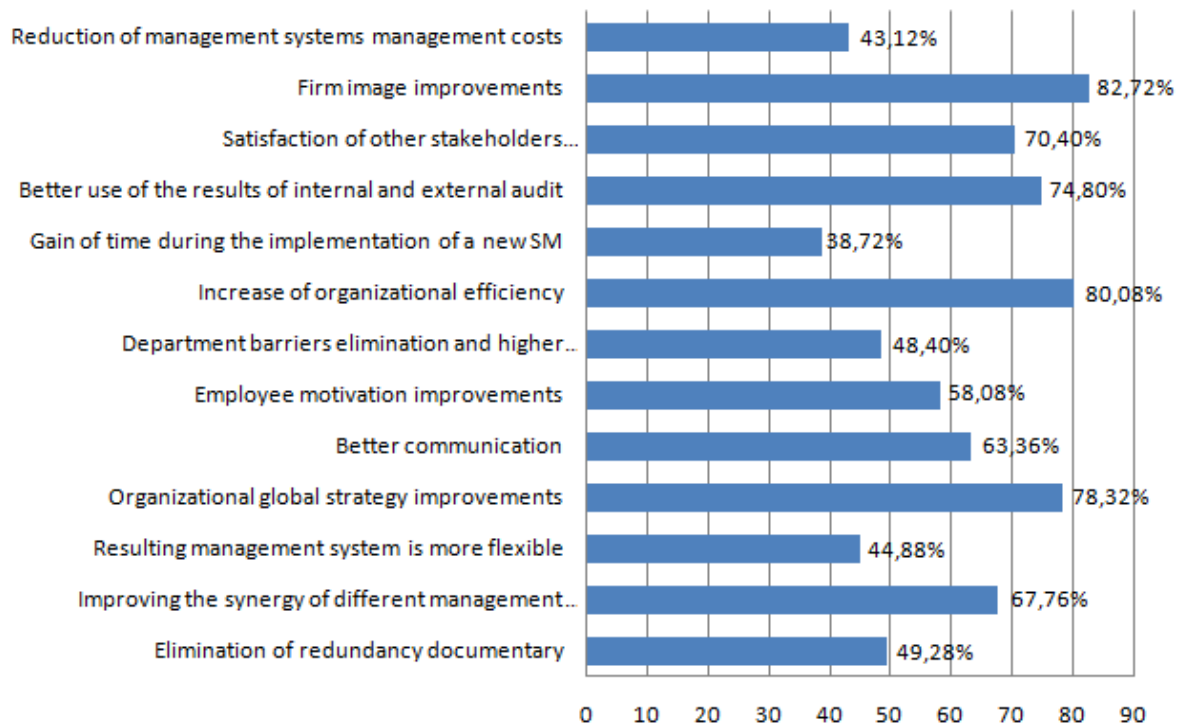


Figure 12. Benefits of integration Management systems

However, these points demonstrate that organizations benefits from aspects may be as internal as external, since they increase their organizational efficiencies and they enhance the external characteristics such as business image and external audits.

3.7 Difficulties of Integration Management Systems

Despite the many advantages mentioned above, firms also face some difficulties in the integration process. The challenges most mentioned by Moroccan companies was the excessive time to lead the IMS with a level of importance (89.71%), the lack of guidelines to ensure the integration (82.24%), the lack of support and collaboration between departments (78.08%) in addition to the reluctance of employees facing the integration of management systems and resistance to change with a level of importance (74.76%), The fact that management systems are conducted by different people from different disciplines, this represents a real barrier that prevents companies to integrate their management systems, then comes the concern of documentation, Too many documents to be processed at integration with a level of importance (73.10%), lack of internal organizational culture (70.61%). While (68.12%) of businesses suggest that standards have different structures, the ISO 9001 standard focuses on satisfaction of customer, ISO 14001 aims the satisfaction of the environmental community, while OHSAS 18001 is oriented on the satisfaction of employees by the mastery of health and safety risk.

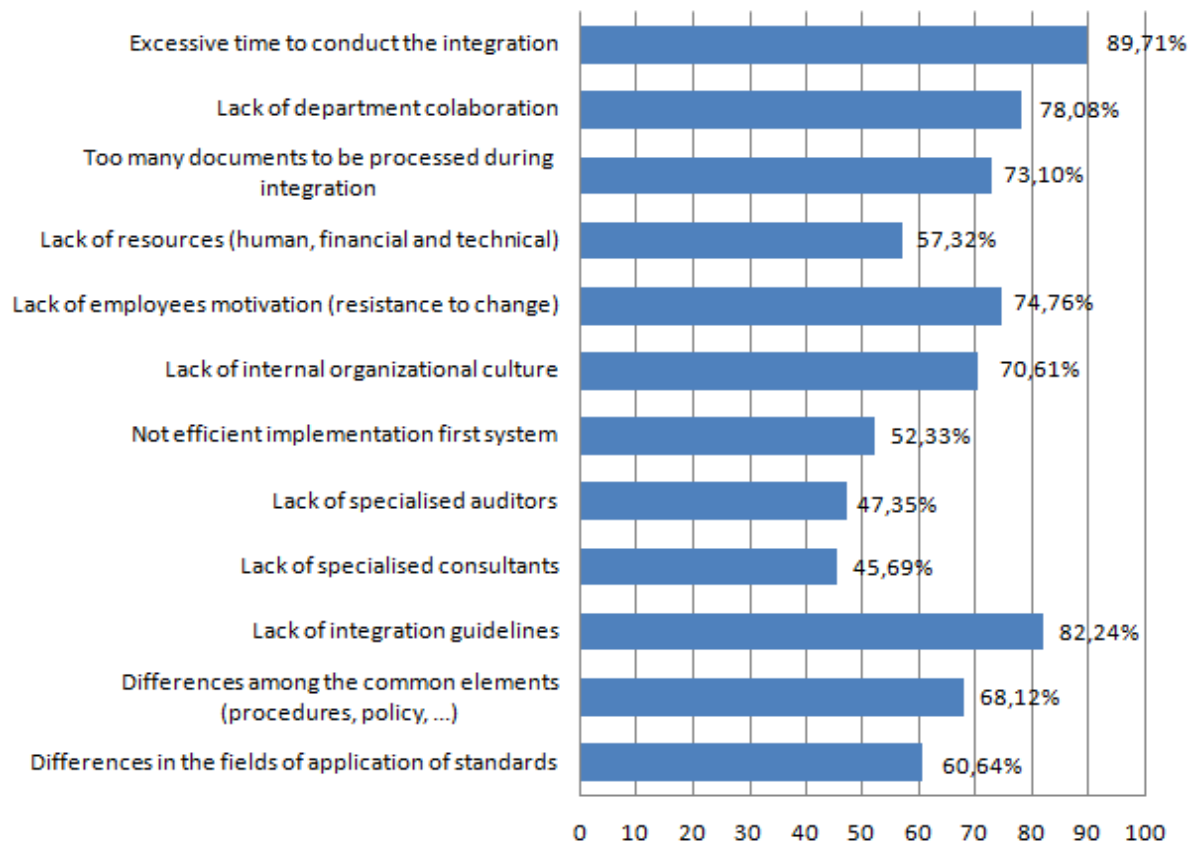


Figure 13. Difficulties of integration management systems

These results are particularly pertinent because it shows the interest to motivate and involve human resources to achieve a good integration system.

3.8 Implication of Human Factor in the IMS

By focusing advantage to the IMS (Integrated Management System), defined as: "an Integrated Management System is a system that enables the integrated management of several areas of different management such as quality, safety, environment, human resources, within a single organization." We can conclude that participation and involvements employee appear as mistress weapons necessary for its implementation.

As such, companies are becoming increasingly aware of the importance of taking into account the human factor and performance potential that results. In fact, support for leaders and managers enables organizations to achieve their objectives, optimize their costs, increase efficiency, productivity and performance. However, training and awareness programs help to develop new skills, and to build relationships with those around him, staff, customers and suppliers. So employees feel involved and committed to the growth and success of the integrated approach. Meanwhile everyone in the company understands the health and safety risks it faces, it identifies its customers and knows their expectations, he knows what the environmental impact of its activities. Beyond these known information he learns and implements best practices and ensure zero defects, zero accidents and zero environmental impact.

The recognition of the individual as the fundamental lever of the overall performance of the organization cannot be realized on the basis of an understanding of the motivation of each person. Moreover, the success of the IMS founded on the skills and motivation of staff in order to guarantee its best engagement in the activities entrusted to it. However poor adequacy of staff is facing obstacles to good management of QSE systems.

For these raisons, nowadays the specialist authors continue in their writings to highlight the important role of the human potential in achieving performance. This potential is even identified as the main link in the success of a deployment strategy of IMS and the achievement of the objective performance.

4. Conclusion

The study found that the IMS develops progressively. Sooner or later, almost every business of our sample was engaged on this way and, in numerous cases, reached a high level of integration concerning policy, strategy, documentation, audit and control, etc. Undoubtedly, there are certain elements such as the structure, size and the economic sector have an influence on perception the advantages and barriers to the adoption of a the different management systems and their subsequent integration.

Indeed, this contribution will be subject to other future work, which we examine the level of use of tools and techniques to improve the quality, safety and environment management systems, and we propose a model integrating QSE tools and techniques in a continuous improvement approach.

Acknowledgement

Thank and gratitude to all responsible of companies interviewed and certification bodies for their assistance and cooperation in data collection, which contributed to the success of our work.

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