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**Integrated Management Systems in Industrial Companies of the São Paulo State –  
Brazil**

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# **Integrated Management Systems in Industrial Companies of the São Paulo State – Brazil**

## **Abstract**

The integrated management systems of quality, environment and safety represent significant competitive advantages for organizations. The aim of this paper is to present, through the case study method, the main characteristics of integrated management systems in five industrial companies of the São Paulo State, Brazil, highlighting its positive aspects and difficulties. The main benefits of this kind of system in the companies studied are: improvement of internal and external customers' satisfaction, company image enhancement, better use of resources, waste reduction, and increase of the internal communication efficiency. The resistance to change is greatest difficulty of these firms.

**Key-words:** Integrated management system; industrial companies; quality management; environmental management; safety management.

## **Introduction**

The Companies looking for new innovations and measures in search of competitive advantage in a tight market. The certifiable management systems integration is an important differentiator for organizations adapt to a market driven focus on customer satisfaction and demand for quality, environmental responsibility, and health, and safety of employees (LAGROSEN; LAGROSEN, 2003; KILBOURNE, 2004; LAGROSEN, 2007).

According to Makau (2003) and Karapetrovic (2003), the Integrated Management System (IMS) promote significant benefits to organizations, especially for those seeking innovation through deployment and certification of their management systems.

São Paulo state has a Gross Domestic Product (GDP) of U\$ 433.51 billion from the U\$ 1.28 trillion of Brazilian GDP (IBGE, 2008). Thus, one can consider that Sao Paulo accounts for a significant participation in the economy.

In this context, the questions that guide this study are: companies generally understand what is a process of integration of management systems certifiable? What are the positive and negative characteristics of an IMS?

This article aims to verify, through a qualitative research based on the method of multiple cases study, the characteristics of the integration of certifiable management systems, which earned its benefits and what are the difficulties faced by companies in five industrial organizations from São Paulo state.

The study investigated five São Paulo's industries from different branches and have IMS. The variety of classes of activities allows for diversity in obtaining the data, since the integration of management systems may be similar in companies with the same branch of activity.

After this introduction, is presented a theoretical system of quality management, environmental management system, health and safety management system, integrated management system, research methods used, cases' analysis, conclusion, and finally, the used references.

### **Quality management**

The quality is attributed to products and services, focusing on aspects such as customer satisfaction, standardization, and control processes. Thus, according Lakhali (2006) and Battika (2003), the quality represents competitive advantage through improved organizational performance.

To develop and maintain quality, companies need to deploy a system to meet needs of customers and stakeholders, to prevent non-compliance, and seeking solutions for your website when available, for thereby a process of continuous improvement, demonstrated the PDCA cycle, as can be seen in Figure 1 (KANUNGO, BHATNAGAR, 2002; BATTIKHA, 2003; LAGROSEN; LAGROSEN, 2003; ZU, 2009).

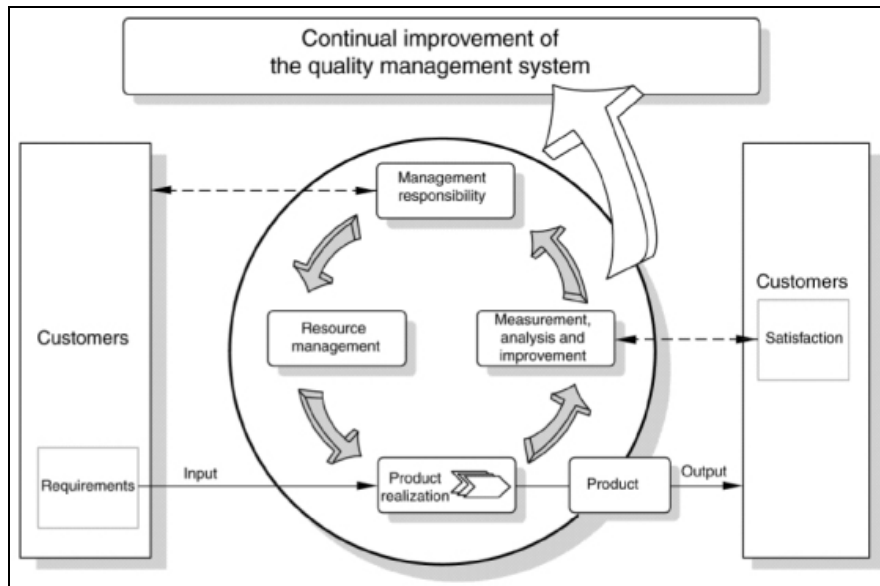


Figure 1 – PDCA cycle  
Source: adapted of ISO 9001 (2008).

The system of quality management (QMS) promotes several benefits to organizations, as can be highlighted: improved products, services and processes, increase customer satisfaction, improved corporate image; competitive advantage. But, there are still difficulties in its implementation, that are the main low level of involvement of senior management, lack of involvement of middle managers, resistance to change, little is known about the requirements of rule by the officials; resistance investment for its implementation (POKINSKA, 2006; LAGROSEN; BACKSTRON; LAGROSEN, 2007).

According to Zeng, Tian, and Shi (2006), ISO 9001 gives requirements for the implementation of QMS in the organizations. This standard is part of the ISO 9000 series, governing the quality management system, and consists of the ISO 9000 (fundamentals and vocabulary), ISO 9001 (requirements), and ISO 9004 (guidelines for performance improvement).

For the success of the QMS in a company, that's necessary the commitment of senior management and all employees, in addition to providing financial resources, and adequate infrastructure (HEUVEL, 2005).

The table 1 shows the macro structure of ISO 9001.

Macro items of ISO 9001
0 – Introduction;
1 – Purpose;
2 – Normative references;
3 – Terms and definitions;
4 – Quality management system;
5 – Management responsibility;
6 – Resource management;
7 – Product realization;
8 – Measurement, analysis and improvement.

Table 1 – Structure of ISO 9001

Source: ISO 9001 (2008).

## Environmental management

With the inherited culture of the industrial revolution, the world was absolutely focused on strictly financial enrichment, by promoting the production of an environmentally unacceptable level, where the environment was not part of the priorities. This culture has resulted in environmental degradation that reaches its limit. In this context, society, the business sector and the governmental and non-governmental spheres, seek to act to suit the environmentally responsible development (BENITO, BENITO, 2006; KILBOURNE, 2004).

According to Ann, Zailani and Wahid (2006), development must be based on three points: economic, social and environmental policy that can be sustained and above all balanced, as shown in Figure 2. Thus, the environmental management shows up as a strategy to manage the environment internalizing it to other political, social and economic that is, also characterize the environment as a priority within the context of strategic decisions.

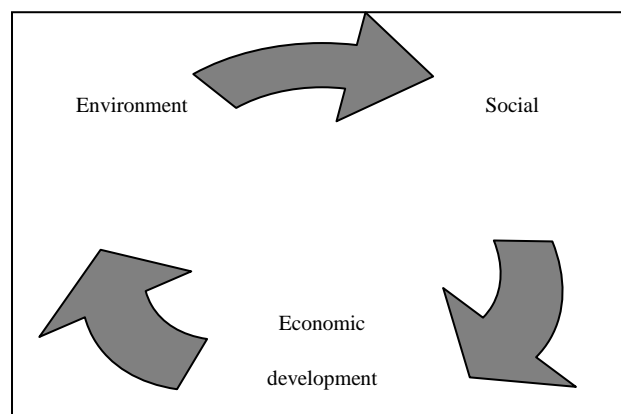


Figure 2 – Development tripod

Source: Adapted of Ann, Zailani e Wahid (2006).

An Environmental Management System (EMS) represents the internalization of environmental in the strategic planning company, by means indicators that provide

information about the company's position on environment, such as impacts and preventative, and remediation.

The implementation of an EMS in the company may derive some benefits such as minimizing and preventing the deposition of waste, improved management of the company, cost reduction, improvement in corporate image and competitive advantage (FRYXELL; SZETO, 2002; SILVA; MEDEIROS, 2004).

The standard that guides and gives requirements for the EMS in companies is ISO 14001, which belongs to series of standards ISO 14000. Its structure is shown in Table 2.

Macro items of ISO 14001
0 – Introduction;
1 – Purpose and scope;
2 – Normative references;
3 – Terms and definitions;
4 – Requirements environmental management system.
Annex A - Guidance for use of this standard
Appendix B - Correspondence between ISO 14001:2004 and ISO 9001:2000
Appendix C - Bibliography

Table 2 – Structure of ISO 14001  
Source: ISO 14001 (2004).

According to ISO 14001 (2004), one of the main requirements for the company to its EMS is the commitment to continuous improvement, that is, by identifying its environmental aspects and impacts, measure your indicators and plot planning to improve regarding these indices. This practice is supported by the PDCA cycle, which is illustrated in Figure 3.

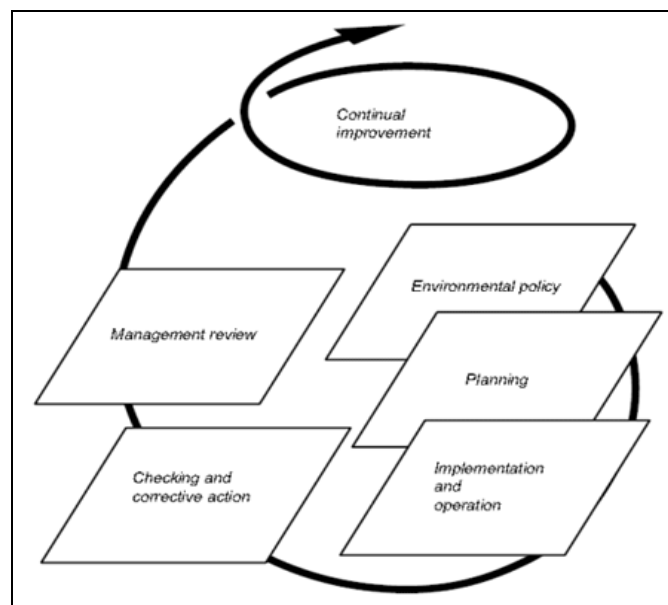


Figure 3 – PDCA of EMS  
Source: ISO 14001 (2004).

## **Safety and health management system**

The concept of safety and health can be defined, according to OHSAS 18001 - Occupational Health and Safety Assessment Series (2007), as the set of factors that could affect the safety, and health of employees, staff, and visitors outsourced a organization. In this context, the management system of safety and health (OHSMS) is defined as a system of management responsible for safety and health of employees and people who are part of the organization (OHSAS, 2007).

One of the guiding rules for the implementation of OHSMS in organizations is the OHSAS 18001 (OHSAS, 2007). According to Salamone (2008) and Mohamed (2002), the OHSMS promotes several benefits to companies, some of them: improved corporate image, increased competitiveness, open markets, prevent risks and accidents, increased productivity, and improved quality of life of employees, and co-related.

There are difficulties in the implementation of an OHSMS at companies, among them, there is inconsistency in the way of deployment, resistance to change, lack of management commitment, employee turnover, and lack of involvement by the employees (KOUFTEROS; VONDEREMBSE; DOLL, 2002; MOHAMED, 2002).

The structures of OHSAS 18001 can be illustrated in Table 3.

Macro items of OHSAS 18001
0 – Introduction;
1 – Purpose and scope;
2 – Publications and references;
3 – Terms e definitions;
4 – General requirements ;
5 – Policy of OHSMS;
6 – Planning;
7 – Deployment and operation;
8 – Check.

Table 3 – Structure of OHSAS 18001

Source: OHSAS (2007).

As with other management systems, to the success of OHSMS, the commitment of management is essential finding the process of continuous improvement, as is illustrated in Figure 4.

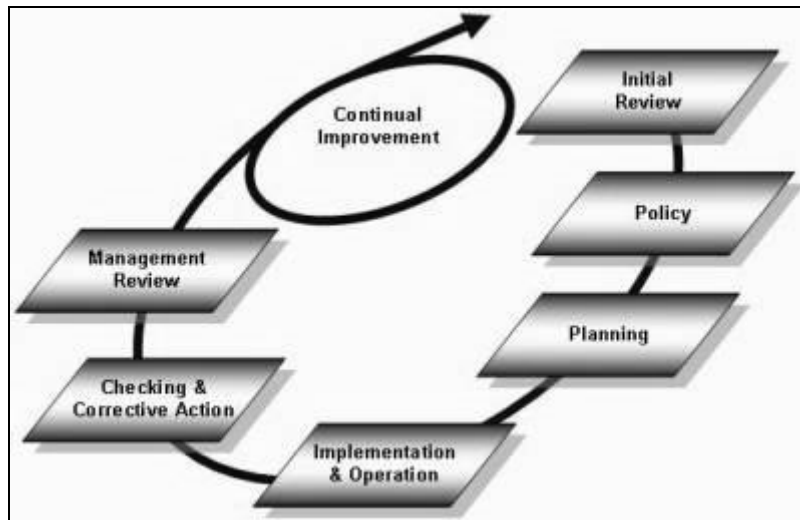


Figure 4 – Continuous improvement of OHSAS 18001  
 Source: OHSAS 18001 (2007).

### Integrated management system

The Integrated Management System (IMS) includes management systems focused on quality (QMS - ISO 9001), environmental (EMS - ISO 14001), health, and safety (OHSAS 18001), as well as adding aspects of social responsibility certified by SA 8000 (MAKAU, 2003). This work describes the first three mentioned management systems, as illustrated in Figure 5.

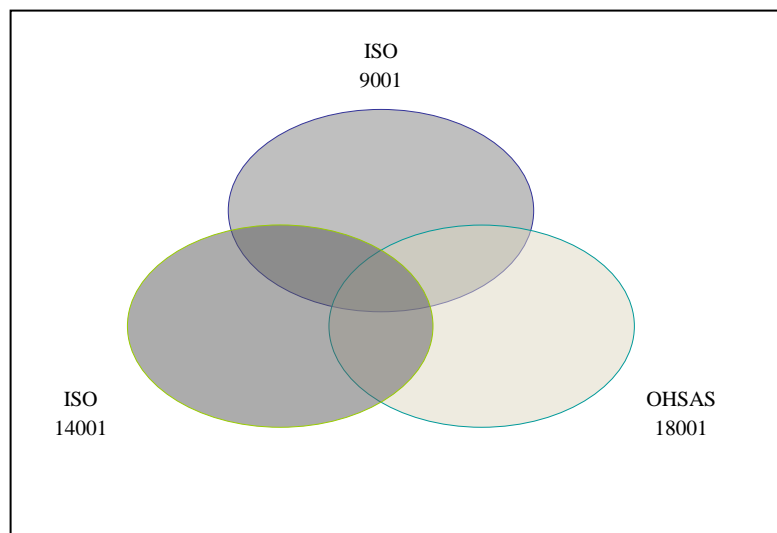


Figure 5 – Integrated management system  
 Source: Adapted of Bamber *et al.* (2000); Zutshi & Sohal (2005).

According Karapetrovic (2003), the integration of certifiable management systems must be made simultaneously, following a continuous flow of deployment, as can be seen in Figure 6.

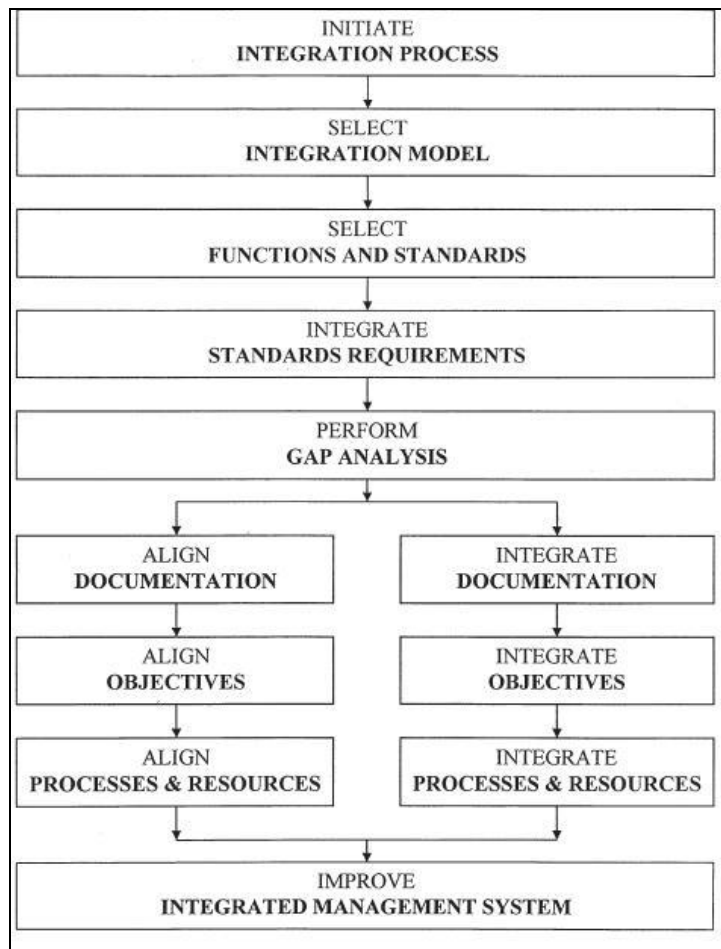


Figure 6 – Generic process of integrated management system  
Source: Karapetrovic (2003).

According to Makau (2003), IMS may derive important benefits to organizations, such as increased productivity, improved company image, cost savings for deployments, and certification of management systems, the possibility of synergy in the integration, ease management of management.

Internal and external factors influence the management systems. The integration of these systems, and these influences, are even greater as they tackle different systems of management. Thus, it is essential to integrate interactive manner, addressing policies, guidelines, and objectives of management, as well as the requirements of the rules, and peculiarities. This practice is possible by pre-planning on the part of senior management and consent of all employees of the organization in order to ensure the overall integration of all areas (DOLOI, 2007; ZUTSHI; SOHAL, 2005).

## Material and Method

For Barnes (2001), the success of a paper depends on the choice of an appropriate research method. According to Yin (2003), the methodology of multiple case receives reliable research, analysis and allows for comparisons between their characteristics.

The article used the qualitative method with case studies on five industries from Sao Paulo state, Brazil, to verify the main features of the IMS, thus revealing, its main strengths and weaknesses.

The development methodology is illustrated in Figure 7.

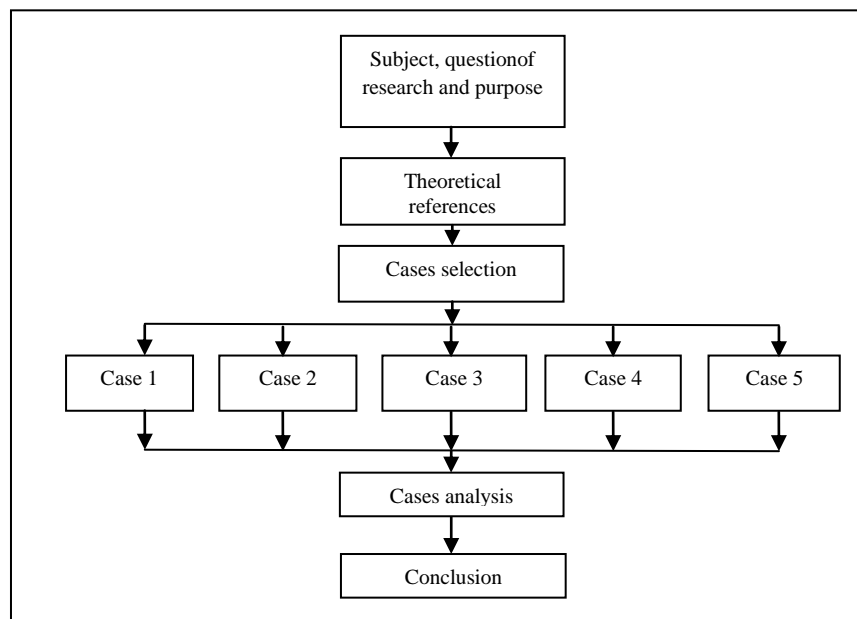


Figure 7 – Research methodological development

## Multiple case studies

For this study, in five cases, the company 1 is from the automotive sector; firm 2 is from processing industry, specifically the packaging industry; the company 3 is the branch of manufacturing industry; the company 4 works in the paper and pulp, and the company 5 is from metallurgical sector.

The five companies have integrated management system, its main characteristics are presented in Table 4.

	Company 1	Company 2	Company 3	Company 4	Company 5
Billing (million dollars)	More than 30	More than 30	1081	2216	271
N° employees	1000	350	3800	3540	2074
Export	No	Yes	Yes	Yes	Yes

<b>Advice on implementation</b>	Yes	Yes	Yes	Yes	No
<b>Simultaneous implementation</b>	Just ISO 14001 and OHSAS 18001	No	No	No	No
<b>Year of implementation</b>	QMS (2003) and EMS and OHSMS (2005)	QMS (1997) and EMS and OHSMS (2003)	QMS (1993) and EMS and OHSMS (2001)	QMS (1994) and EMS and OHSMS (2008)	QMS (1994), EMS (2000) and OHSMS (2008)
<b>What was built?</b>	Guidelines, the scope of the system, user management system, document control, records control, process planning, planning of integrated management system, communication, critical analysis by top management, measurement and monitoring of processes, internal audit, treatment non-conformity of products, corrective and preventive action, acquisition. identification and traceability, continuous improvement.	Policy that expresses the vision and strategy of the company, defining the structure and documentation and its control; definition of media means the direction in which they commit to support the IMS, and reports the results of IMS, IMS planning, setting goals related with the policy; competence awareness and training, critical analysis, auditing, continual improvement, identification and analysis of requirements, review of systems.	Part documentary company (records, data security and documents), process control, corrective measures and prevention.	User of management systems, control of documents and records, critical analysis, job descriptions, training, work instructions, AC/P, P & D, Internal audit, selection of suppliers.	User management.
<b>What isn't built?</b>	Specific indicators: having a workplace organized and safe (5 S program); provide training to staff, dismissal of officials concerned with occupational disease; internal campaigns - HR management; reduce the occurrence report; inspection final index; waste production processes matrix; meet client programming or shipment; political system (separate); goals partial integration, customer property and the product, processes related to the client; design and development, assessment of dangers and aspects, legal and other requirements and operational control of health and safety and environmental; emergency preparedness.	Customer requirements; identification traceability; emergency plans; environmental aspects, evaluation and risk control; legal and other requirements; incident investigation; identification and traceability and product and service provision.	There was no integration in the parts not directly involved with the main activities of the company, as HR departments, MKT and finance, for example.	Objectives of the systems are separate, and the specific requirements	Coordination, procedures, policy, one part of the objectives and goals and training.
<b>What indicators is integrated?</b>	Decrease number of accidents with lost (Base 2008); Reduce the generation of dangerous waste Class I for the recyclable (Base 2008); Increasing recycling / reuse of waste (Base 2008); Reduce the number of non-compliance.	Consumption of natural resources; waste generation; waste disposal; dangerous waste generation; generation recycled in the process; number of customer complaints (product quality, emissions and	Value of scrap produced; electricity consumed; accidents at work; waste generated; returned products and water used;	Productivity in relation to volume of accidents; waste volume; volume of areas for environmental preservation; volume of energy consumed for	Environmental indicators related to the cost of scrap and losses of raw materials and inputs.

	Integrated process.	smell); downtime accidents; consumption energy seeking new clients (national and international) and customer satisfaction research.		energy production and security performance.	
<b>What trainings is integrated?</b>	Integrated management manual; how integrated system; work instructions; standard operating; process flowchart; checkpoint; inspection standards; documents of external origin, tables; records and forms the integrated system.	Policy and its objectives; document control; continuous improvement process; plan of corrective and preventive action; control of non-compliant products; training of auditors; disposal of materials; preparation and emergency response.	Training with all employees involved with the management systems. Trained himself well, new forms of conduct related to the three certifications used by the company.	None	None

Table 4 – Characterization of the companies studied

Consequently, it can observe that these are all companies with high incomes. Except for the second company, all are large and almost all but the first company exporting. These three characteristics indicate that the integration of certifiable management systems is a practice by large organizations; in other words, it is noted that companies use this practice to ascend to a competitive market.

Also note that unless the company 5, all of them used external consultancy for the integration of management systems, and none of them simultaneously implemented. It shows that the integration of management systems is a relatively new practice, because companies still need external guidance for its performance and make integration after they have already isolated the certifications of their management systems.

The integration can be noted that the company has integrated the scope 1 and manuals of the management, control, measurement, and monitoring of processes, and documents, participation, and critical analysis of top management, recognition, and treatment of non-compliance, internal audit, communication, and continuous improvement process.

The IMS has among its aims to integrate management systems and their requirements while minimizing costs, with monitoring and control, as can be seen in the case of company 1, and the items that were not integrated.

The company 1 has integrated important indicators of management systems that can increase the efficiency of its monitoring by the integration. It was also observed for the organization 1, a satisfactory integration of their training, thus promoting global awareness of their management systems.

The company 2 has integrated policy management systems, document control, process improvement, communications, internal audit, training and review of senior management. This case has integrated important parts of their management systems, although not with the same proportion of company 1, the organization 2 used the IMS efficient integration, to join some of the items were not included because these are all specific requirements each management system.

Note to be sufficient integration of indicators of the management systems, since they cover major indexes tracking. The integration of training was also satisfactory, allowing the promotion of wider capacity in terms of systems management.

The company 3 includes only the control of documents, records, the process of prevention, and corrective actions regarding nonconformities. The case of 3 organization, as can be seen, implemented a number of parts, and poor conditions of their management systems, which would not be conducive to proper functioning of the IMS, although he claimed not only the integration of aspects not related to systems management.

There is still the company 3, an integration of their poor management indicators, and address superficial aspects of their management systems. The integration of training can be considered satisfactory, since it promotes global awareness of their management systems.

Already the company 4 has integrated the manuals and policies of the management, control of documents and records, review of senior management, internal audit, training and work instructions. The company 4 used the IMS similarly to the company 2, with the satisfactory integration of parts of its management systems, especially as they deal with aspects relevant to the integration, but has not included the manuals of management.

This case has had a satisfactory integration of the indicators management systems, such as observing the increased productivity to reduce accidents, which shows the efficiency of IMS. There was no integration of training.

The company 5 integrated only of the manual management systems. As can be seen, the company 5 used insufficiently the IMS, although not to inform the integration of the few parts of their management systems.

The integration of management indicators was also unsatisfactory for the case 5. There was no integration of training.

As mentioned earlier, the integration of management systems certifiable receives considerable benefits to organizations, that the main are illustrated in Table 5.

<b>Key benefits realized by the integration of management systems</b>	
<b>Company 1</b>	<ul style="list-style-type: none"> <li>✓ Ease of management;</li> <li>✓ thinking;</li> <li>✓ optimization procedures, and</li> <li>✓ greater overall efficiency.</li> </ul>
<b>Company 2</b>	<ul style="list-style-type: none"> <li>✓ increase in profitability;</li> <li>✓ increased customer satisfaction;</li> <li>✓ cultural development of employees;</li> <li>✓ better use of resources (financial and natural);</li> <li>✓ improving the image of the company for stakeholders;</li> <li>✓ decrease in the number of documents and procedures;</li> <li>✓ optimization of processes and increase productivity;</li> <li>✓ biggest opportunity in business;</li> <li>✓ reducing costs, losses and rework;</li> <li>✓ reduction in environmental impacts;</li> <li>✓ reduction in the number of accidents and risks during the work;</li> <li>✓ sustainable development of the company;</li> <li>✓ reduction in the number of audits;</li> <li>✓ single information system which facilitates decision-making; and</li> <li>✓ breaking down barriers to international trade..</li> </ul>
<b>Company 3</b>	<ul style="list-style-type: none"> <li>✓ reducing the costs of maintenance audits;</li> <li>✓ reduction of energy consumption;</li> <li>✓ reducing the number of accidents in the company;</li> <li>✓ standardization, reduction and simplification of documents; and</li> <li>✓ greater control over the scraps.</li> </ul>
<b>Company 4</b>	<ul style="list-style-type: none"> <li>✓ volume reduction in audits and those responsible for management systems currently in the form of committees;</li> <li>✓ alignment of processes in a systematic way; and</li> <li>✓ improving the company image.</li> </ul>
<b>Company 5</b>	<ul style="list-style-type: none"> <li>✓ optimization features such as meetings, motivational programs and purchase equipment.</li> </ul>

Table 5 - Key benefits realized by the integration of management systems

It shows a variety of benefits among the companies studied, this is due to the fact that there are differences between the processes of integration of systems management, characteristics of enterprises and also how these organizations understand the integration of management systems. Among the benefits to all, are the main

improvement in the management of resources and processes, improving corporate image, reducing costs and staff to audit the management systems in isolation, and systematization of processes.

In addition to benefits realized by the integration of management systems, there are still difficulties for the practice, that the main ones are illustrated in Table 6.

<b>Major problems for the integration of management systems</b>	
<b>Company 1</b>	<ul style="list-style-type: none"> <li>✓ In all systems the main difficulty pointed out by the company was the low capacity of the workforce;</li> <li>✓ difficulty in understanding the rule, and</li> <li>✓ resistance from employees.</li> </ul>
<b>Company 2</b>	<ul style="list-style-type: none"> <li>✓ high initial costs;</li> <li>✓ cultural change;</li> <li>✓ low skill on the part of older employees;</li> <li>✓ difficulty in understanding procedures (due to integration of documents);</li> <li>✓ audits are longer and more complex;</li> <li>✓ fulfillment of legal requirements; and</li> <li>✓ adequacy of the ERP.</li> </ul>
<b>Company 3</b>	<ul style="list-style-type: none"> <li>✓ These are more related to the expected results of the environmental field than the actual difficulties of integrating systems. It was hoped that the integration would provide the recipe for raising all that committed organizational performance in the areas certified.</li> </ul>
<b>Company 4</b>	<ul style="list-style-type: none"> <li>✓ High cost of deployment because of the size of their units, mainly in the certification of ISO 14001.</li> </ul>
<b>Company 5</b>	<ul style="list-style-type: none"> <li>✓ resistance from employees;</li> <li>✓ lack of commitment from top management, and</li> <li>✓ determination of the array to not fully integrate their management systems.</li> </ul>

Table 6 - Major problems for the integration of management systems

It is observed variety of difficulties faced by companies, what can be explained differences in the processes of integration of management systems, and also by characteristics of enterprises. But there are considerable difficulties similar to some companies, such as resistance from employees, lack of commitment from top management, high costs and lack of understanding of standards and integration.

Note itself a immaturity as the integration of management systems for businesses, since a lack of understanding of standards and integration is difficult by all the organizations in the study, such as the 3rd company that cites this as the only difficulty for the integration of management systems.

## **Conclusion**

The qualitative method has been well used in this article because it showed five companies with IMS, and its main features, allowing proper analysis, and interpretation.

It is noteworthy to limit your search because it is five cases among a large sphere of enterprises with IMS, also the data collection was limited to information provided by companies, and review your documents.

Although research has shown diversity in some benefits and difficulties for the integration of management systems, there is similarity among some, such as improving internal processes and its products, increasing customer satisfaction, decrease in number of non-compliance and returns, increase productivity and profits, improved management of resources, enhance the image of their market, systematic processes and management systems and reduction of costs and time to the integration of management systems. The difficulties it stress: resistance from employees, lack of top management commitment, and understanding of low standards, and the integration of management systems.

It highlights the lack of understanding of integrated systems, which significantly influences the integration and monitoring of the SGI in business. It can see that in general, companies do not yet have a real interpretation of SGI, as do the integration and monitoring of their management systems in various ways, and often inefficiently. Finally, it can be noted in this study that the SGI promotes benefits for companies, and represents a competitive market.

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