

Review

The Identification of Common Models Applied for the Integration of Management Systems: A Review

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Abstract: The paper presents a synthesis of strategies, benefits, and barriers in the integration management systems (IMS) implementation at the organizational level. The research is based on an assessment of 103 papers, 7 books, 12 standards, and 7 sites. The analysis of works aims to highlight the common integration models of several IMS, aspects related to IMS implementation, benefits of IMS implementations, and the nature of integration strategies. The research results present valuable information which can be used by top managers of organizations, certification bodies, and consulting organizations to encourage the implementation of integrated management systems.

Keywords: integrated management system; integration models; basics of integrated management systems; strategies



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1. Introduction

An integrated management system (IMS) is defined as a single set of interconnected processes sharing a single fund of human resources, information, materials, infrastructure, and financial resources to achieve a composite of objectives related to the satisfaction of a variety of stakeholders [1–4]. IMS started with the publication of the quality management system (QMS) in 1987, after which the ISO 14001 environmental management system (EMS) was introduced in 1996 and the OHSAS 18001 in 1999, and then different systems management similarities were established [5,6].

Since 1998, Willborn and Karapetrovic (1998) [7], and later Karapetrovic (2003) [1], have defined integration as a single set of interconnected processes that share a unique pool of human resources, information, materials, infrastructure, and financial resources to achieve multiple objectives related to the satisfaction of a variety of stakeholders [1,7]. Integration is the correlation of all the organization's processes in a coherent system so that it functions as a unitary whole, the definition being found by researchers in several papers [1,8–15]. The elements that can be integrated are policy, objectives, management [16], and management responsibilities [17]. Will (2019) [18] stated that for full integration of the management system, the organization needs every component, i.e., objectives, documents, procedures, processes, and requirements of the position they hold. IMS defines the processes which establish the links between people and the objectives of the organization, distribution, and analysis of data (documents and records) to ensure the improvement of the organization's performance [16–18]. An integrated management system (IMS) represents a management system that integrates all the components of a business into a coherent system to allow the achievement of its purpose and mission by management through an integrated approach to meta-management [19]. Moreover, anything that affects business results should be integrated into the management system (MS) [9,20–22]. The management system (MS) includes four main elements: policy, management objectives, management responsibilities, and defining processes, to ensure the improvement of the organization's performance [10,16,17,23].

The system should be interpreted as an entity made up of a series of subsystems that group processes, which also comprise activities. The organization-type system is built on

infrastructure, based on an organizational structure in which the management functions are applied. The correlation of all subsystems (organizational, informational, decision-making, and methodological) is the basis of the organizational structure, which encompasses current internal management practices. To be considered integrated parts of the company's management system, an interconnection must be made for these subsystems so that there are no boundaries between the company's processes [8–11,13,17,24–29]. The structure of a system is determined by the mission assigned by the organization's management [30].

A very important effect on business outcomes is the risk-based thinking, the internal and external issues, the stakeholder's requirements, and the organization's product and services, including process complexity [31–33].

This research aims to present a synthesis of strategies, benefits, barriers, and risk-based thinking approaches for integrated management systems, which have been studied, analyzed, and investigated by different researchers from several countries so far, and to make an evaluation of the proposed models for integrated management systems.

2. Research Methodology

The assessment and analysis of the specific literature is a necessary phase in any research paper, and its main purpose is to evaluate the state of knowledge of a particular topic, and to detect areas for future research development [34]. To elaborate our work, three stages were completed, similar with those proposed by Seuring and Müller (2008) [35], and also used by many researchers:

1. Planning;
2. Implementation;
3. Analysis and results.

The methodology applied in carrying out the systematic analysis of the literature regarding the common integration models of several MS is presented further.

The Web of Science, Scopus, Google Scholar, Science Direct, Emerald Insight, and Taylor and Francis databases were used for the assessment and analysis of the literature. The analysis was based on three main phases, using descriptive analysis, category selection, and material evaluation.

For the first stage, searching terms were identified: "Integrated Management System", "Common Integration Model", "Basics of Integrated Management Systems", "IMS strategies", and "IMS implementation". The stages followed to assess and analyze the specific literature found in the studied databases and the selection methods of the materials that formed the basis of our research are shown in Figure 1.

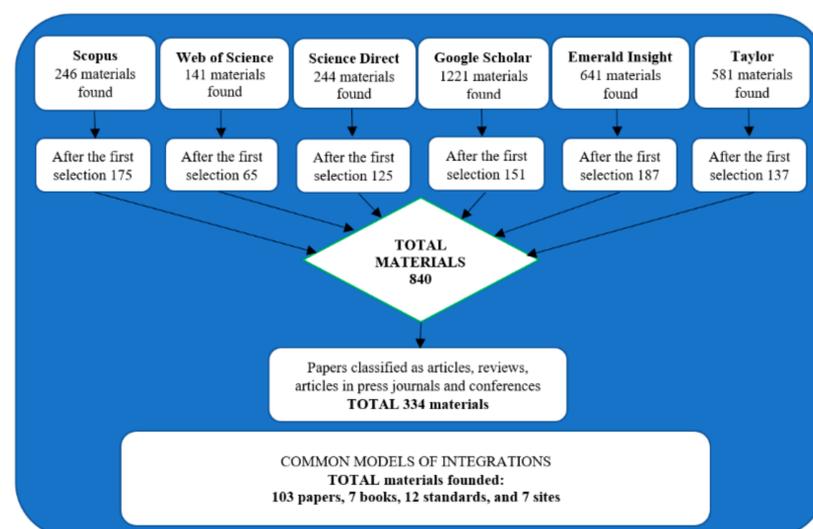


Figure 1. Methodology for searching the materials.

The titles and abstracts were assessed and a selection of duplicates (i.e., titles) was made, using the Excel-Home-Conditional Formatting-Highlight Cells Rules-Text which contains the function of the information found in the six databases.

After reading and assessing the abstracts, the articles that do not agree with the objective of our paper were removed. A selection of 334 materials based on the chosen topic (common integration models) was made, and resulted in 103 papers (classified as articles, reviews, and articles in press and conferences), to which 7 books, 12 standards, and 7 sites were added. After completing the selections, the reading of all 103 papers and 7 books were done, as well as the examination of the standards and sites, and the conclusive information for the proposed topic was extracted.

3. Results and Discussions

The updating of standards has led to opportunities and challenges in management theory, both for researchers and for top managers who want to implement IMS, following the similarities of their requirements. These significant updates of the standards (process-based, focus on input and output of the processes, risk-based thinking, leadership, and commitment) revealed that it is important that the goals of the organization ensure customer satisfaction, reduce costs, and increase long-term competitiveness [4,5,8,20,36].

The purpose of establishing MS is to measure more efficiently and effectively the degree of compliance, to conduct a comprehensive assessment of the management system, to establish ways to streamline the system, and last but not least to identify the vulnerabilities to establish proposals for IMS improvement [37,38]. The International Organization for Standardization (ISO) has developed, after 2013, the standards ISO 9001:2015 [39], 14001:2015 [40], ISO 45001:2018 [41], ISO 27001:2013 [42], ISO 50001:2019 [43], ISO 20001:2018 [44], ISO 22301:2019 [45], and ISO 55001:2014 [46] for the implementation of management systems. To these standards that impose requirements, another standard such as ISO 56002:2019 (which provides a guide to implementing the innovation management) that can be integrated with the first ones for performance-oriented management system has been added [47]. It would be preferable for an organization with multiple management systems to manage them as a single IMS, based on a common structure [48], than to separate the systems [21,49–51]. The International Organization used a common structure to update the standards shown in Table 1, which allows and somehow institutionalizes the integration of MS, despite the absence of an international standard dedicated to IMS [18].

Table 1. The number of certificates valid in 2019 and 2020 for all countries (196 countries) (ISO SURVEY 2020).

Standard	Total Valid Certificate		Total Number of Sites	
	2019	2020	2019	2020
ISO 9001	883,521	916,842	1,217,972	1,299,837
ISO 14001	312,580	348,473	487,950	568,798
ISO/IEC 27001	36,362	44,499	68,930	84,181
ISO 22000	33,502	33,741	39,651	39,894
ISO 45001	38,654	190,481	62,889	251,191
ISO 13485	23,045	25,656	31,508	34,954
ISO 50001	18,227	19,731	42,215	45,092
ISO 22301	1693	2205	6231	4662
ISO 20000-1	6047	7846	7778	9927
ISO 28000	1874	520	2403	968
ISO 37001	872	2065	4096	5946
ISO 39001	864	972	1852	2341

The organization must design, implement, and maintain an IMS focused on customer satisfaction and meeting the expectations of all stakeholders [49,52–61]. When designing such a structured and efficient system, emphasis should be placed on identifying costs [48,62] and existing or potential issues related to quality, environment, health, and safety at work, and implementing the necessary risk assessment and corrective actions [52,54,56,58,60,61].

Identifying existing problems and costs is very important if we take into account the remarkable effort developed by ISO in the latest 2015 revisions of ISO 9001 [39] and ISO 14001 [40], which aims to integrate standards by adopting a common structure at a high level, based on identical basic context, common terms, and common definitions. The results of previous research from literature, as shown in the works by De Oliveira (2013) [63], Nunhes et al. (2017) [64], and Nunhes and De Oliveira (2020) [33] revealed that the main topics researched are related to:

1. IMS integration levels;
2. Major motivations, benefits, and obstacles in the operation of several MS;
3. Models for the implementation of IMS.

3.1. Advantages of Integration, Internal and External Barriers, and Difficulties for IMS Implementation

The advantages of an IMS consist of reducing risks and increasing profits, reducing documentation, identifying new customers, strengthening the market position, facilitating staff training, continuing improvement, and implementing a vision for future development [65]. The advantages of IMS, described by several authors, are summarized in Table 2.

Table 2. Advantages of Integrated Management Systems.

Advantage Description	References
Reduction of duplicates and written documentation.	[9,49,55,56,66,67]
Improved operational efficiency.	[9,55,68,69]
Simplification of system procedures.	[49,56,58]
Implementation of management systems in a shorter time.	[15,56,58]
Reducing the time for audits and unifying them, unifying the training, and reducing the time.	[49,67]
An organization that already has an integrated management system has an advantage over an organization that does not have an integrated system.	[11]
Reducing organization costs: - certification costs; - audit costs; - costs of training employees; - consulting costs.	[9,49,52,54–56,58,61,70–75]
Streamline: - streamlining human resources; - streamlining the strategies of organizations; - streamlining the allocated (financial) resources; - streamlining the definition of responsibilities; - streamlining the organization's processes; - streamlining communication.	[49,56,58,59,61,69,72]
Social advantages: - teamwork; - work awareness for quality, environment, health, and safety at work, etc.; - awareness and sense of responsibility for the work done.	[52,54,56,58,60,61]

Table 2. *Cont.*

Advantage Description	References
External advantages: - customer satisfaction (beneficiaries of product or services); - improving the image of the organization; - involuntary marketing by customers (also recommends the products or services purchased to other people); - business card for other collaborations; - improving the quality of products or services, the environment, human health, and safety.	[49,52,53,55–60]

It was analyzed that as there are advantages for IMS, there are also barriers and risks to the implementation of IMS; those most encountered by the researchers are described in Table 3.

Table 3. Barriers and Risks to IMS implementation.

Barriers	References
<i>Internal barriers</i>	
Insufficient financial and human resources.	[10,16,17,61]
The lack of information and training.	[10,67,72,76,77]
The fear of failing in the IMS implementation.	[56,67]
The lack of support from top management.	[58,78]
The lack of a strategic plan for the implementation of IMS.	[5,16,56]
The lack of specialists to perform audits, methodologies for conducting audits.	[58,79]
The lack of perception of what IMS means.	[56]
The lack of employee motivation for IMS implementation.	[58]
Employees do not accept the new system.	[56,70]
Employees do not agree to lose their current position.	[1]
Employees are not aware of the new changes.	[78]
Diversity of MS standards and purpose.	[58,72,80]
Employees lack the concept of integration.	[58,78]
<i>External barriers</i>	
Question marks on the external vision of employees regarding IMS.	[81]
Insufficient benefits from IMS implementation.	[60]
Lack of instructions on the implementation of the IMS.	[60,82]
Lack of ISO promotion of IMS integration.	[27]
Various requests from stakeholders.	[81]
Permanent updating of regulations.	[56]
Unavailability of a common format for IMS.	[1,29]
Implementing the IMS requires changing the culture.	[9,76,80]
Lack of communication with the work team and partners.	[78]
Different cultures with different personalities hinder the integration of IMS.	[56]

Table 3. Cont.

Barriers	References
<i>Risks to IMS implementation</i>	
Closer integration of one MS compared to other systems (paying more attention to a certain MS). Underestimation of requirements from a certain MS, Lack of experience of the management representative in implementing the IMS. Lack of information on the legislation in force in a certain field, regarding the particularities of MS.	[9,80]

3.2. Basics of IMS

In the specific literature, most studies indicate different models and approaches to the proposed models for the integration of management systems. The proposals for the basis of IMS implementation described by Asif et al. (2010) [83] are based on three key elements for implementing IMS. The essential elements for the basis of IMS implementation contain three questions: “What should it contain?”, “Where should it take place?”, and “How should it be implemented?” [83].

Starting with MS integration, researchers have tried to address all types of aspects that would lead to common integration models for different types of MS. Research began with “auditing integration” approached by Karapetrovic (2000, 2009) [15,79], Williams (2004) [2], Kraus and Grosskopf (2008) [84], and Bernardo et al. (2010) [3], and later “integration strategies” studied by Zeng (2007) [72], Karapetrovic (2009) [15], De Oliveira et al., 2013 [63], and Savino and Batbaatar (2015) [85].

Other research has sought to approach aspects such as the “benefits of integration”. Simon et al. (2012, 2017) [58,86] and Bernardo et al. (2015) [37] presented the advantages and disadvantages of integration and what would be the motivations of top managers to start the integration process. Moreover, De Oliveira (2013) [63] and Domingues et al. (2016) [87] proposed “models and guidelines for the integration process”. Over time, several models of integration have been developed and proposed [9,50].

As stated by Bernardo et al. (2015) [37], the integration process comprises four main aspects: the level of integration (refers to the degree achieved after integration), integration of audit systems and the level of integration of audits, integration methodology (consists of common models and tools), and integration strategy adopted (refers to the number and sequence of implementation) [37]. On the other hand, De Oliveira (2013) [63] argued that a global international standard is needed to guide the integration process by organizations, as the studies revealed.

Several integration rules have been developed to help unify certain standards in Austria and New Zealand (AS/NZS 4581:1999) [88], England (PAS 99:2006) [89], Denmark (DS 8001:2005) [90], and Spain (UNE 66177: 2005) [91]. ISO has not developed a standard to guide all organizations on the implementation of systems, but it has published an ISO manual (2008) which somewhat gives some guidance on integration, but nothing concrete enough to be exemplified by all organizations around the world, such as ISO 9001 [39], ISO 14001 [40], ISO 45001 [41], etc.

Several initiatives were taken by ISO in 2008 on various methodologies, tools, and practices for the integration of MS standards, and more recently it published Annex SL, which is the standard that defines the new high-level structure for all ISO management systems standards, to facilitate the integration by using unique structures of standards for management systems (Nqa 2021) [92]. The Annex SL aims to promote the compatibility between different standards of management systems. The revisions of ISO 9001: 2015 [39] and ISO 14001: 2015 [40] were based on the guidelines in Annex SL [25]. Taking into account the lack of an international standard dedicated to IMS, the ISO has recently updated a guide to integrating MS standards, ISO 2018, using a common high-level structure [93]. However, the researchers continue to find common elements of integration, benefits, and sustainable

strategies, and the highest challenges are dealing with the motivation and commitment of human resources [94].

Regarding the proposals for the integration of standards, there are two approaching models: one model refers to the “basic management standard of higher-level”, with some modular support standards to meet the specific requirements, and another model called the “alignment approach”, representing the standards of the parallel management system with a high degree of structure and common content of MS from different standards [25,47,95,96]. According to Dahlin and Isaksson (2017) [97], elements defining integration could include factors such as level of integration [3,26,98], scope, and extent of integration [99,100].

A synthesis of the most important integration strategies and models proposed during the time is presented in Table 4. These strategies can be considered the basis for the implementation of IMS in organizations.

Table 4. Integration strategies and proposed models for IMS implementation.

Basics Strategies Types/Proposed Model for IMS	Explanation Strategies/Proposed Model for IMS
<i>Basics of integration and sequential strategies</i>	
Existing integration for MS [7]	There are three possible options for MS integration: <ol style="list-style-type: none"> 1. Establish a Quality Management System (QMS) and then an EMS; 2. Establish an EMS first and then a QMS; 3. Establish a QMS and an EMS while adopting the “system of systems” concept.
Possible integration sequences [29]	The integration can be done in either of two ways: <ol style="list-style-type: none"> 1. Adoption of individual management systems followed by initial integration (i.e., separate systems); 2. Development and implementation of an IMS, integrated from the beginning.
The model proposed [29]	Two methodologies for integration were proposed: an incremental one in which first a management system is implemented and then the integration is realized, and a radical model in which the organizations do not have an MS implemented and implements and integrates the systems simultaneously.
Integration of basic aspects [101]	Integration can be achieved according to three main innovative aspects, such as: <ol style="list-style-type: none"> 1. Integration of aspects; 2. Integration according to the MS level; 3. Integrating the performance of innovation management and analyzing the relationship between them.
The model proposed [101]	The proposed model is based on three main factors: <ol style="list-style-type: none"> 1. Integration of aspects; 2. Integration of the MS level; 3. Integrate the performance of innovation management and analyze the relationship between them.
Step-by-step integration methodology [12]	Integration can be made considering very important steps, such as: <p>Step 1. Integration of audits;</p> <p>Step 2. Achieving the integration according to the PDCA structure.</p>
Sequential / simultaneous integration [15,63,72]	Sequential integration must first implement quality management and then other management systems. Simultaneous integration, i.e., all systems are implemented in an integrated manner.

Table 4. Cont.

Basics Strategies Types/Proposed Model for IMS	Explanation Strategies/Proposed Model for IMS
The model proposed [72]	It proposes three levels of integration according to the PDCA structure: Level 1. Strategic synergy is a priority; Level 2. The synergy of organizational structures; Level 3. Documentation synergy.
The model proposed [102]	It proposes the integration of management systems in four stages: 1. Critical processes; 2. Process coordination; 3. Main processes; 4. Auxiliary processes.
Four-step integration [18]	Will et al. (2019) propose step-by-step integration for ISO 26000: Step 1, get started: - Initiating the decision of the top manager; - Defining the roles and responsibilities of the IMS implementation team; - Gathering international information about the integration process. Step 2, defining: - Carrying out the feasibility study on the compatibility of standards; - Alignment of specific objectives and proposed goals; - Selection and implementation of strategies; - Project planning and management. Step 3, implementation: - Implementation of project integration; - Policy formulation and integration; - Perform integration for documents, procedures, and basic resources to achieve one of the degrees of integration (added integration, partial integration, and full integration). Step 4, improve: - Continuous improvement after the implementation of the third level of integration (full integration); - Combining internal audit with self-assessment.
<i>Basics of integration and alignment strategies according to management systems and standards (MSS)</i>	
Alignment [9,103]	Alignment of common elements of standards is adopted; The practical implication is the same in all structures of the organization; Separate procedures are developed but placed in the same manual (partial integration).
Integration [9,103]	Full integration of all relevant procedures and instructions (full integration).
The model proposed [9]	The IMS model proposed is based on a culture of continuous learning and improvement with three levels of integration.
Common ground [37,63,72]	Standards have changed over the last decade and have reached a common structure and alignment with Guide 72 (2001) [104] requirements, and now it can change to a common ground that supports all the structure based on Dr. W. Edwards Deming's cycle, who designed a graphical representation based on continuous improvement.

A very important aspect of IMS is the common structure of the updated ISO standards, thus ensuring risk management in all processes of the organization and in the early

stages, so as not to have a future impact on the organization's processes, and to allow the internalization of IMS.

In addition to the basic strategies of IMS implementation, presented in Table 4, another approach consists of the internalization of IMS [103,104]. Testa et al. (2018) [105] defined IMS internalization as a substantial integration rather than a superficial one of specific management practices and principles, as mentioned in the standards of management systems in the day-to-day activities of organizations. Internalization is considered the manner that counters the superficial implementation of management systems [106].

Heras-Saizarbitoria (2011) [107] and Allur et al. (2014) [108] underlined that the importance of evaluating indirect internalization is relevant, but it cannot be adopted homogeneously by all companies. The implementation of an internalized IMS based on several standards showed that the certification of compliance through annual audits by third parties is not in line with the standards [109].

Following the studies made by Bernardo et al. (2015) [37] and Cabecinhas et al. (2018) [14], it is shown that for the implementation of IMS by an outside person or persons from the organization, the integration is much faster and easier if the integration is done in collaboration with third parties outside the organization. The person or people inside the organization know the problems from the inside much better than the staff who provide consulting outside the organization and the consultants have skills and knowledge in finding the best methods for organizing and implementing IMS [12,14,37].

In another recent study, Purwanto et al. (2020) [110] showed that by ISO 9001:2015 [39] application, integration management system has a significant influence on the quality performance, such as increasing customer satisfaction, reducing customer complaints, reducing defects, reducing product return, and decreasing quality costs.

Gianni and Gotzamani (2020) [109] revealed that the "outsourcing" factor is the possible dependence of external resource companies for IMS monitoring, and this factor functions as a "control factor" in the internalization process.

A detailed analysis of the performance indicator control factors (KPIs) and on the degree of integration shows that IMS has three degrees of integration: added integration which includes objectives and documents; partial integration containing procedures and processes; and full integration containing, in addition to the two mentioned degrees, the organizational resources, responsibilities, and competent authorities to deal with audits and management system [18,111]. KPIs are used to track the performance of IMS, to assess the critical factors related to the organization's objectives and the success of the organization, and to track how the organization manages to fully or partially integrate IMS.

As described by Abisourour et al. (2020) [111], KPIs must be intelligible (theoretical definitions and terms must be clear and well defined); useful (procedures must be clear and concise to ensure comparability, even if an indicator is for internal use only. Indicators must be easy to measure and easy to apply); standardized (a standardization unit or functional unit is required for the indicators to make sense); representative (defined indicators must represent the performance of the process or organization); coherent (all KPIs must be reliable with organizational environmental policies); and sensitive (the system's sensitivity to stress that must be noticeable in response to predictable stress). The KPIs that should be measured are approached from the following perspectives: financial results; customer orientation; internal processes; innovation and learning; employee satisfaction; and environment and community [112].

A methodology proposed by Kerzner (2017) [113] and Parmeter (2015) [112] for establishing the KPIs includes three main steps: finding the critical and successful factors of the organization; defining the measures that will work in the organization; and acquiring the measures to manage performance. Other studies made by Cabecinhas et al., (2018) [14] showed that the more organizations implement an IMS, the better it will be for other organizations. This will have a remarkable impact on an improved economy and the development of organizations, and the stakeholders will be more satisfied. Regarding the studies

related to IMS, they will advance, and new research and experiences for organizations will appear [14].

3.3. Common Models of Integration

The synthesis of common integration models (Table 4) presents an overview of the most well-known integration models proposed by different researchers.

Following the assessment and analysis of the specific literature, it was observed that several researchers such as De Oliveira Matias and Coelho (2010) [70], Perdomo-Ortiz et al. (2009) [114], Prajogo and Sohal (2001) [115], and Salomone (2008) [67] claimed that the motivation and involvement of human resources are essential for the success of the integration process and require special attention. According to the aspects stated by Domingues et al. (2016) [25], IMS is implemented nowadays by a lot of companies. The basis of IMS implementation strategies began with three possible options for the integration of management systems proposed by Karapetrovic and Willborn (1998) [7].

As a result of the literature assessment, Table 4 presents 16 integration models which are based on different proposals for the integration of management systems. The proposed models are different depending on the period when they were made, but the purpose of the models is common. In 2004, the standards had a different structure and requirements, and researchers at the time, such as Labodová (2004) [29], proposed two models, one based on incremental integration and a radical model. Later, other researchers [6,12,72,116,117] proposed various models according to the Plan–Do–Check–Act (PDCA) cycle or models which consist of three levels of integration. Based on the conducted studies and their experience, new models for the implementation of management systems were proposed.

Comparing the 16 proposed models shown in Table 4, it was found that the objectives and purpose of the models are common, i.e., to integrate at least two management systems with small differences. The differences consist in the methodology of approaching the integration, with the proposed models having the basis of a systematic approach according to a certain method that is flexible and based on main factors or certain levels of integration. These differences are normal due to the updating of the standards and the gaining of experience from the studies carried out up to the date of proposing a model; they must have all the same goal, i.e., to integrate the management systems. From the studied works, it can be concluded that all the authors had a remarkable contribution to IMS implementation, and therefore, a classification by their contribution has been made (Table 5). From them, only five researchers [6,12,72,116,117] totally support the approach of the PDCA cycle in IMS implementation.

Our work also includes a classification of articles by contributory groups to obtain an overview of the researchers who contributed to the development of IMS (Table 5). In terms of similarity, the analyzed studies show that there are many benefits to implementing IMS in reducing duplicates [9,49,55,56,66,67], operational efficiency [9,55,68,69], simplification of procedures [16,49,56], time reduction, efficiency, social benefits, etc. The benefits and barriers of IMS implementation should be presented to all top managers in all organizations, in order to make them aware [76].

The similarities of the strategies regarding the nature of the integration and the proposed models must be correlated so that top managers can approach sequential implementation [15,63,72] or incremental implementation [29]. The differences between the proposed integration strategies are related to the period when the strategy was proposed, i.e., the years in which there were changes in the ISO standards. The purpose of the proposed strategies and models is common to all strategies and models, i.e., to implement as many standards as possible.

Table 5. Classification of articles by contributory groups for IMS.

IMS Contribution Group	IMS Contribution	References
Strategies for implementing and motivating MS integration.	Strategy analysis and integration motivation have a positive impact on organizations that have started the integration process or want to implement new IMS.	[2,3,6,7,9,12,14–16,18,25,26,29,33,37,38,63,72,79,80,83,85,86,95,101–103,117–123]
Advantages and barriers to IMS implementation.	The advantages and barriers to the implementation of IMS have been studied and analyzed, facilitating the integration process.	[1,5,9,11,15–17,49,52–56,58–61,66–72,74–78,80–82]
IMS implementation considers common integration models.	Facilitates IMS through experience in studying and analyzing common integration models.	[6,9,12,29,72,83,101,116,117,120–123]
Integration levels and KPIs.	Improving the performance of the organization according to the level of integration and considering the indicators of PKIs.	[14,18,37,109–113]

3.4. PDCA Cycle in the IMS Implementation Process

The graphical representation of the Plan–Do–Check–Act (PDCA) from the Guide 72 (2001) suggest the continuous improvement of standards [6,37,63,72]. Over the last decade, the changes of standards that reached a common structure and alignment of their requirements can be observed. The requirements from these standards, such as organizational context, leadership, planning, support, operations, performance appraisal, and improvements, have been designed considering the stages of the PDCA structure. The similarities between the PDCA cycle and the requirements of the updated standards can facilitate the integration process by developing an effective integration strategy [96]. Many researchers support the integration of management systems after the PDCA cycle [9,25,64,72,95,96,124].

Starting from the PDCA structure, an integrated management system is a complex construction that identifies the common models of standards and aims to take advantage of the common elements of several separate systems by making them work together in a unitary whole [15,27–29,63,72,125].

According to the PDCA cycle, Zeng et al. (2007) [72] proposed an interesting strategy based on three levels of integration: (1) the strategic synergy is a priority, (2) the synergy of organizational structures, and (3) the documentation synergy. The PDCA cycle is also advocated by Rebello (2014) [116], Nunhes et al. (2016) [6], Majernik et al. (2017) [117], Bernardo et al. (2018) [12], and Souza and Alves (2018) [123] who in turn proposed models similar to those of Zeng et al. (2007) [72], with small differences in implementation and which from our point of view has a chance of success for IMS implementation.

The PDCA model has more and more supporters worldwide and more and more organizations are implementing IMS according to the PDCA model. The proposals of some researchers such as Labodová (2004) [29], Jørgensen (2006) [9], Asif et al. (2009) [10], López-Fresno (2010) [120], and others (Table 4), need to represent an essential objective approached in several organizations during the implementation of IMS. As a result of the analysis of the proposals for the implementation of IMS, it can be stated that using the PDCA cycle can lead to the lowest costs for implementation.

4. Conclusions

The study presents a detailed critical analysis of the models proposed by different researchers, providing a vision for top managers, consultancy organizations, and certification bodies on the most widely used and expensive integration models, and those advantageous from an economical point of view for IMS implementation.

The presentation of the synthesis on strategies, advantages, barriers, implementation of the PDCA cycle in the IMS integration process, integration levels, and KPIs offer valuable information which will help future research on IMS and organizations. The implementation of IMS in organizations is based on risk-based thinking and the emergence and resilience of MS, representing strong points in an increasingly competitive global environment.

The control factors, which must exist in any organization, must be considered by the annual audits by customers (stakeholders) and audits by annual certification bodies, and not by a third-party organization that seeks to integrate management systems (integration outsourcing).

The results provide an overview of IMS implementation, summarizing the strategies, benefits, barriers, and risk-based approach for top management of organizations, certification bodies, and integration consultants. In addition to all these elements mentioned above, the analysis encourages the IMS implementation and simplifies the integration process for top managers, which must be aware that the implementation of IMS is necessary for the sustainable future of any organization.

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