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INNOVATIVE MODEL OF DEVELOPMENT AND IMPLEMENTATION OF IMS

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A B S T R A C T

This paper analyzes how a systemic approach to management can be used to facilitate the development and implementation of an integrated management system (IMS) within an organization. It is argued that every solution for integrating management systems requires two elements: a conceptual model and a supporting methodology. While research on IMS modeling is quite extensive, the development of methodologies for achieving fully integrated systems is still not at a satisfactory level. In the IMS acronym, particular emphasis is placed on the I (path to integration). The label M (Management) refers to the desired level of quality, while S (System) represents the methods and activities necessary to achieve the desired goal. It should be noted that all three concepts are directly related. From the above, it can be concluded that the development of IMS represents a broad field of diverse approaches. The paper presents an original model for the development and implementation of IMS systems, thus providing an approach and a set of criteria for selecting the most appropriate IMS model..

1. INTRODUCTION

In extensive literature in this field, there are numerous models of IMS. The research analysis aims to highlight the common integration models of several IMS, aspects related to IMS implementation, the benefits of IMS implementation, and the nature of integration strategies (Samy et al., 2015). The research results provide valuable information that can be used to encourage the application of integrated management systems. Integrating documentation, followed by aligning internal objectives, processes, and finally resources, is one possible approach. Some companies integrate parts of MS documentation (e.g., policies), while others aim for full integration of objectives, processes, and resources. Therefore, partial and complete integration are possible. Quality, environment, and safety are the most common, as the basic standards are easily accessible. Corporate social responsibility is also essential. In what order should selected management systems be introduced? This depends on existing systems and focus. Quality, followed by the environment and safety, is the most common order. Other possible sequences are considered by Karapetrovic (2002). However, the practicality of this ultimate level of integration will probably be debated for a long time.

2. PREREQUISITES FOR IMS

Moreover, companies should present their quality product and service-related issues. From these needs, the concept of integrated management systems (IMS)

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has been developed. In theory and practice, the question is posed as to why some companies integrate their management systems, while others with similar contexts do not even accept specific management systems. Understanding decision-making regarding IMS and the motivations that influence IMS implementation is crucial for two reasons: First, it will help theorists predict behavior during IMS implementation, and second, IMS will identify the mechanism that encourages implementation.

Effective communication of strategies and policies is critical to the sustainable success of an organization. Communication should be purposeful, timely, and continuous. A process-oriented approach based on the PDCA concept should be considered vital support, regardless of the methodology applied.

What are the necessary levels of integration? For example, Jonker and Karapetrovic (2004) mention five: political, conceptual, systemic, normative, and pragmatic. It should be possible to use a common structure of policy, goals, control routines, monitoring, and improvement for general management. This is the way to achieve business goals through planning as a process that relates to the entire business system. In order to achieve defined goals, changes must be made in the business system, primarily in culture. Culture is made up of tradition, habits, and accepted behavior that are partly inherited and partly can be influenced by it. Culture is not a static concept, it develops slowly and is reflected in the policy of the business system, which is the basis for planning (Badreddine et al., 2009). There is no unanimous definition of organizational culture. Some scholars describe culture as "shared values", another group as "way of working", and a third group considers it a combination of both.

However, there is a general consensus that culture is a dynamic concept that can be learned. Cultural changes can only be a matter of adapting to company values, not a true change in behavior. The authors suggest that while culture can be managed and specific values changed, the rationale for change affects the success of change efforts. It becomes critical that all participants understand the principles to be adopted and participate in their implementation: the success assessment of change programs depends on the perception of what changes are supposed to achieve.

A quality culture requires a combination of organizational culture, individual culture, and quality principles. A strong quality culture includes customer orientation, continuous improvement, using data and analysis to support decision-making, and involving people in quality issues.

Vision is a guiding force that is the result of three components: openness, spontaneity, and a sense of reality. Openness is directed outwards, while spontaneity is directed inwards, accepting various positions from which the functioning of the system is observed. The synthesis of openness and spontaneity must be based on reality if we want the vision to succeed. Management values can stem from the vision and can be a powerful tool for consistent implementation of management in practice (Jankulović 1998).

3. IMS DEFINITION

The Integrated Management System (IMS) is defined as a set of interrelated processes that share a common set of human resources, information, materials, infrastructure, and financial resources to achieve composite objectives related to satisfying various stakeholders (Williams, 2004; Bernardo et al., 2010; Thomé et al., 2016; Davoudi et al., 2012). The Integrated Management System (IMS) represents a management system that integrates all components of the business into a coherent system to enable the achievement of its purpose and mission through an integrated approach (Bernardo et al., 2016; Will et al., 2019; Asif et al., 2010b). Quality, environment, and occupational health and safety often form the core of the IMS. Compatibility provides the opportunity to integrate the three systems into the organization. However, it should be noted that the three systems have their own specificities. 9000 is customer-focused (ISO, 2015), ISO 14000 aims to support environmental protection and pollution prevention while promoting social and economic harmony, and OHSAS 18001 emphasizes proactive professional risk control (Samani et el. 2019) and allows the organization to improve its safety and health of employees (Ispas, 2022; Purwanto et al., 2020). Resources include human and financial resources. The use of resources requires consideration of the similarities and compatibilities of the three systems in implementation. (Bernardo et al., 2016; Will et al., 2019; Asif et al., 2010a). Different companies have different management practices for defining their mission, vision, strategy, including budget preparation, performance control, and motivation. It can be seen that there has been no real attempt to integrate the economy into the ISO system. We propose the following definition for a fully integrated management system: one that involves managing all relevant stakeholder needs, including all suppliers, customers, and other stakeholders in the supply network. Top management must be actively involved in conveying organizational goals and plans and in motivating and rewarding employees. Support and commitment from top management are essential for process integration and for maintaining and improving organizational processes. Resistance to integration is expected due to a lack of a strategic plan at the enterprise level, undefined responsibilities, and weak training. Therefore, people learn and develop a quality culture, which exists through the values that the organization defends, the way of working, and collective learning. The main proposal for overcoming internal difficulties is a necessary cultural change, training, and education of all employees at all hierarchical levels to improve their

understanding of the process and thus their motivation. If organizations are aware of the difficulties in integration, they will face the integration process more prepared, and the likelihood of successfully completing the process will increase, and staff training could help in this challenge. This can make organizations more efficient and competitive.

4. LEVEL OF INTEGRATION

The scope of integration is often limited, which indicates that it is important to define what is meant by an IMS. If it is viewed as a fully integrated IMS, the mission, vision, policy, goals, organization, and roles should be well understood and accepted by the organization. The management system (MS) includes four main elements: policy, management objectives, management responsibilities, and process definition, to ensure performance improvement (Scipioni et al., 2001; Beckmerhagen et al., 2003; Labodová, 2004; Nunhes et al., 2016). The system should be interpreted as a whole composed of a set of subsystems that group processes, which also include activities. The organizational system is based on the organizational structure in which management functions are applied. The correlation of all subsystems (organizational, informational, decision-making, and methodological) is the basis for the organizational structure that encompasses current internal management practices. In order to be considered as integrated parts of the company's management system, it is necessary to establish mutual connectivity between these subsystems so that there are no boundaries between the company's processes (Domingues et al., 2016).

The level of integration describes to what extent different systems have become one, ranging from a low level with some coordination to complete merging. In Bernardo et al., (2016), a model with four levels (0-4) is presented, showing eight different studies and their degrees of integration. Karapetrovic (2002) presents three possible levels of integration. The first level concerns the integration of documentation, i.e., a common manual with specific procedures required by different areas in the IMS. The second level concerns the alignment of basic processes, goals, and resources, i.e., directing the use of basic processes "by integrating planning, design, implementation, and other activities vertically through management systems." The third level relates to the creation of an "all-in-one system," i.e., a universal system that manages all previous systems in the organization. The implementation of different management systems is possible because there are common principles (process approach, PDCA, risk management, etc.), specifications and methods for integration, common elements of standards, and methods for aligning the interests of stakeholders. Partial implementation of standards/systems can be achieved by (Jurčević, 2019):

- Inclusion, by creating documentation for the basic standard/system (QMS according to ISO 9001), and then expanding it according to the requirements of other standards/systems, and
- Addition, by having each standard/system have its own documentation that is interconnected.

The core that connects all management systems into one system is a process. In order to implement an integrated management system, the business system must meet the requirements of all integration standards. The question arises as to how to do this, or which implementation approach to apply. Implementation of integrated management systems is a process like any other, which is used to convert inputs into outputs. The inputs to this process are the requirements of standards such as ISO 9001:2008, ISO 14001:2015, OHSAS 45001:2018, etc., and the outputs are documented quality management systems, environmental protection and health and safety management systems, and other systems. Like any other process, this process can be modeled in various ways. Depending on how the process of establishing an IMS is modeled and implemented, the results obtained at the output also depend.

There are three basic approaches to implementing integrated management systems:

- Sequential approach to implementing integrated management systems
- Parallel approach to implementing integrated management systems
- Combined approach to implementing integrated management systems

Since the object of IMS implementation is a complex production-business system that needs to meet the requirements of ISO 9001:2015, ISO 14001:2015, and ISO 45001:2018 standards, there is a dilemma as to which of the above implementation approaches is optimal.

The sequential approach to implementing integrated management systems proceeds in such a way that one management system is established first, followed by the second and then the third system. Since ISO 9001 standard is the first to emerge in 1987 and serves as the basis for other management systems, it is logical to establish QMS first, although this is not necessarily a rule in all three approaches (EMS or OHSAS can be established first, depending on the needs of the organization).

ISO has not developed a standard that would guide all organizations in implementing the system, but it has published an ISO manual (2008) that provides some guidance on integration, but nothing concrete enough to be illustrated by all organizations worldwide. A very important aspect of IMS is the common structure of updated ISO standards, which ensures management in all organization processes. An organization that already has an integrated management system has an advantage over an organization that does not have an integrated system. (Zeng et al., 2007).

The advantages of IMS consist of risk reduction and profit increase, reduced documentation, identification of new customers, strengthening of market position, facilitation of staff training, continuous improvement, and implementation of a vision for future development (Arsovski, 2007).

It has been analyzed that just as there are advantages, there are also barriers and risks for implementing IMS, which have been identified in the literature: (Williams, 2004; Will et al., 2019; Nunhes et al., 2017; Bernardo et al., 2018; Rajković, 2010; Arsovski et al., 1995).

Our proposal is that organizations should identify their stakeholders and their needs. These needs must be met efficiently by prioritizing and using existing standards and guidelines to build an IMS. The system's structure is determined by the mission assigned by the organization's management (Badreddine et al., 2009).

5. BASIC ASPECTS OF MODELING

Enterprise modeling is a dynamic process that never ends. It is a process of continuous improvement that adapts to real needs. For these reasons, it is necessary to have a good understanding of the goals and current state of the enterprise.

Modeling can be done from multiple aspects. Here, the functional aspect, information aspect, resource aspect, and organizational aspect are particularly interesting. Each of them is discussed in more detail in (Jankulović, 1998).

By modeling, we more efficiently define appropriate business processes and analyze their structure. The object of modeling in this paper is the enterprise, with the aim of facilitating its integration, which involves connecting into a whole that is more than a simple collection of parts.

The British Standards Institution (BSI, 2006) has prepared a publicly available specification (PAS 99:2006), which is a methodological guide for integrating two or more management systems, whether they already exist as independent or an organization has certified one and wants to align its business with the requirements of other management systems. The specification insists on two elements:

- a systemic approach to defining all processes and documents of the management system,
- treating risks.

PAS specifies common requirements for management systems and aims to provide a framework for implementing two or more standardized management systems in an integrated manner.

The PAS 99:2006 specification issued by the BSI provides a recommendation on how to integrate the requirements of different management systems.

PAS 99 takes into account six common requirements for management system standards and follows the PDCA (Plan, Do, Check, Act) approach present in all major management system standards. By combining the PDCA cycle and common requirements, the structure of the management system is defined.

The PDCA model provides the framework for an IMS based on existing and accepted philosophies of QMS, EMS, and OHSAS. The model interprets the common elements of IMS, which organizations should consider when implementing such a system. The model also indicates that the integration of documentation and verification forms is only part of IMS, and that other elements and factors will influence the achievement of organizational goals.

6. PDCA CYCLE

Similarities between the PDCA cycle and updated standard requirements can facilitate the integration process by developing an effective integration strategy (Rebelo et al., 2004).

Starting from the PDCA structure, the integrated management system is a complex construction that identifies common standard models and aims to leverage the advantages of several separate systems by making them work together as a unified whole.

Based on the PDCA cycle, Zeng et al. (2007) proposed an interesting strategy based on three levels of integration: (1) strategic synergy is a priority, (2) organizational structure synergy, and (3) documentation synergy. The PDCA cycle is also advocated by Rebelo (2014), Nunhes et al. (2017), Majernik et al. (2017), Bernardo et al. (2018), and Souza and Alves (2018), who have proposed models similar to those of Zeng et al. (2007), with minor differences in implementation, which from our point of view, have a chance of success in implementing IMS. The PDCA model has more and more supporters worldwide, and more and more organizations are implementing IMS according to the PDCA model.

As a result of the analysis of proposals for implementing IMS, it can be concluded that the use of the PDCA cycle can lead to the lowest implementation costs.

7. SYNERGY

The word synergy comes from the Greek word "*synergos*", which means cooperation or joint work. It refers to a type of reaction where two factors combine to give a greater common effect than the sum of their individual effects. Simply put, synergy refers to the phenomenon 2 + 2 = 5. A greater common effect as a goal was also the idea for this model.

"More than the sum of its parts" is the vision presented by da Cunha and Figueiredo (2005) for the development of IMS. Their work was an inspiration and starting point for expanding the scope of knowledge in this thesis. IMS deals with the principles, policies, processes, and

procedures needed to achieve quality goals. ISO 9001 is one of the most popular programs for IMS implementation, leading organizations to create a documented system for managing their quality efforts. The biggest challenge that organizations face in their efforts to implement IMS is for quality to become a daily practice, internalizing quality principles in the development of a quality culture.

The synergistic IMS model (in three levels), was developed in China based on research studies of the implementation of quality, environmental, health, and safety management systems.

At level 2, there are three pillars: resources, organization, and culture.

The synergy of organizational culture is also significant for the integration of the management system. The synergy between different responsibilities in the integrated management system and continuous performance improvement is most likely to be established as a result of high ambitions related to the integration process. Therefore, the management system must be internally implemented through the organization and externally through relationships with participants. The synergy of positive interactions between top management and subordinate management systems increases innovative ability, problem-solving speed, and learning ability.

8. MODEL OF DEVELOPMENT AND IMPLEMENTATION OF TQM SYSTEM

The development and implementation of an IMS system involves a long and continuous process that must involve all the resources available to the business system. In short, various implementation strategies can be used for IMS integration. However, the development approach should be tailored to the organization. We believe that an approach focused on the PDCA concept and synergy is a very efficient approach.

The development and implementation of the IMS system are a continuous process that involves all business resources. This process can be divided into 6 phases:

- Determining the IMS strategy
- Preparation of IMS activities
- Development of an IMS system plan and program
- Development of an IMS system
- Implementation of an IMS system
- Improvement of the IMS system

Each of these phases contains several processes that continue or run in parallel with each other. This interdependence implies interaction from the perspective of synergy, which establishes a connection between all phases (Davoudi & Porter, 2012).

9. CONCLUSION

The main innovation of this research is the quality assurance approach based on synergy and the PDCA cycle. It has been shown that some human errors in quality assurance can be eliminated by proper use of synergy. In today's dynamic environment, it is not a question of whether management systems should be integrated, but which is the best for a particular organization. Since all organizations differ in their goals and established business culture, it is difficult to develop a single integration model that would meet the requirements of all organizations. For the success of management integration, it is crucial that the company analyzes the state of the company and ensures that all involved individuals understand the process before the actual start of the process. This is the only way for the implementation of an integrated management system to become an important factor in achieving sustainability. Finally, the need to align IMS with a comprehensive business strategy should always be a priority in order to provide significant support to organizational success.

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