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Research Article

Implementation of an Integrated Management System: A Review and Case Study on Electric Power Transmission in Indonesia

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Abstract: The best management practice for companies with multiple management systems is to harmonize the different management systems into a single system, usually called an integrated management system. Through a number of case studies, this research examines practical implementation in an attempt to comprehend the emerging phenomenon in integrated management system research. An analysis of relevant research shows that current integrated management system research focuses on the most widely used and influential framework in integrated management systems, consisting of the integration of Quality, Environmental, and Occupational Health and Safety management systems. These frameworks are also confirmed by the findings of this research in Electric Power Transmission Units in Indonesia. The main contribution of this research is to provide valuable insights to researchers and practitioners on the most recent conceptual and practical developments that are occurring in the implementation of integrated management systems as the best management practices.

Keywords: integrated management system, electric power transmission.

1. Introduction

Today's global issues are related to living in a world of systems, accelerated and made possible by information and communication technologies and rapid technological, economic, and geopolitical transformation [4]. One of them, which has become increasingly popular in the last little while, is reaching Net-Zero Emissions (NZE). So companies, which are one of the largest emitters in the world, have to consider a more sustainable way of doing business. The Sustainable Development Goals (SDGs), initiated by the United Nations (UN), can be a guide for developing a sustainable business. Developing sustainable aspects of business is important today, where economic, social, and environmental issues can affect all levels of business, and global thinking encourages looking at the big picture.

According to the International Organization for Standardization (ISO), the SDGs can be addressed with ISO management systems [7]. Companies that want to contribute to the SDGs will find that ISO management systems provide effective tools to help address these challenges. For each goal, ISO has identified the management system as the standard that makes the

most significant contribution. However, since there are many types of management systems that cause new problems, with integration, it will be easier to implement multiple management systems [5]. Integration is important from the management system to the company's business processes and is emphasized in the management system, which adds that the company can achieve its performance improvement [14].

Integrated Management System (IMS) is a strategy for managing multiple management systems [5], established to cover management systems in implementing integration [8], and as the primary facilitator of the management system in a company [14]. Recently, the IMS has reached a significant level of development, most of which has been presented through approaches to incorporating knowledge generated in the last two decades [3].

In the IMS process, it is difficult to integrate management departments on a large scale due to the complexity of operations and companies [5]. The complexity of implementing IMS is due to an increasing number of available actions across functions, difficulties in implementation and control, high costs, and unreasonable bureaucratic barriers. Implementing IMS is not always easy and is not cheap either, but the benefits to clients, management, employees, or shareholders are considerable [6]. Sometimes the participation and involvement of workers in IMS activities have not reached the desired level [14]. Meanwhile, promoting awareness is one of the goals of IMS [8].

Strategic, tactical, and operational levels of action can all benefit from the use of IMS at the corporate level [6], which can also add alignment between operational performance and strategic goals [1]. Even if the most recent ISO management systems still have some restrictions due to company culture, it is believed that they will likely continue to be used as a foundation for the creation of future IMS strategies [11]. The majority of studies have generally concentrated on developed countries, and the authors of an analytical review believe that future studies should concentrate on underdeveloped and rising countries [6] and become a common phenomenon among companies [9].

In consideration of the aforementioned, this research aims to comprehend the emerging phenomena of IMS research and explore practical implementation through a case study on an Electric Power Transmission Units in Indonesia. The organization of this research is as follows. Section 2 describes the methodology. Section 3 lists the research results and discussion. Finally, a conclusion to this research is presented in Section 4.

2. Materials and methods

The methodology used in this research is a literature review, case selection, data collection and research instruments, and data analysis [10]. This intends to compare the research findings and implementation in the field to unify the starting point of IMS implementation for researchers and practitioners. The research methodology used is shown in Figure 1 below.

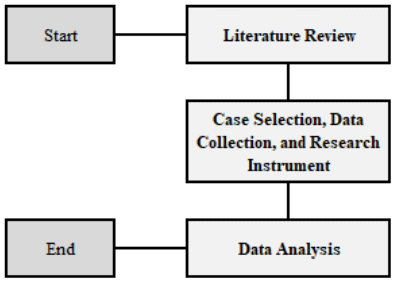

Figure 1. Research Methodology

A literature review approach is chosen for reviewing the literature on IMS. Identification is the first step of a literature review, followed by addressing the objectives, determining the appropriate method, and carrying out a search strategy. For literature assessment and analysis, Scopus, Emerald Insight, Science Direct, Taylor & Francis, and Google Scholar databases were used. The search term in the identified title was "integrated management system", "integrating management system", and "management system integration", and by document type, only research and review articles were selected. The search was limited by the year of publication: 2018–2022. The search was limited only to articles published in English. The final list of studies for all stages has 53 relevant articles (Appendix) that have been published in journals ranked by the Scimago Journal & Country Rank (SJR) by category Q (Q1-Q4). However, of the 53 relevant articles, only 49 presented the IMS framework.

After the literature review, a case study was conducted from January to February 2023. Case studies are experiential research, which allows for a better understanding of current events, especially when context and facts are mixed and difficult to separate [15]. Following the recommendation, the research protocol was designed to include interviews, the collection of internal documents and records, and observations. The final stage of the research methodology was to conduct data analysis. Data analysis was applied to all evidence, including interviews, documents, and observations. A cross-analysis between the literature and the case study was conducted to achieve the main objective of this research.

3. Results and discussion

Since many management systems have the same structure and share many terminologies, definitions, and terms, harmonization through an integration framework is required [2]. These frameworks, commonly referred to as IMS frameworks, are helpful for companies that decide to run one system that can meet the requirements of two or more management systems at once. Figure 2 shows the 18 frameworks used in IMS implementation, according to the results of the literature review. There are at least two types of frameworks that are most widely used. The Quality, Environmental, and Occupational Health and Safety (Q+E+OHS) framework and the Quality and Environmental (Q+E) framework are the most widely used and, consequently, the most significant frameworks in IMS implementation.

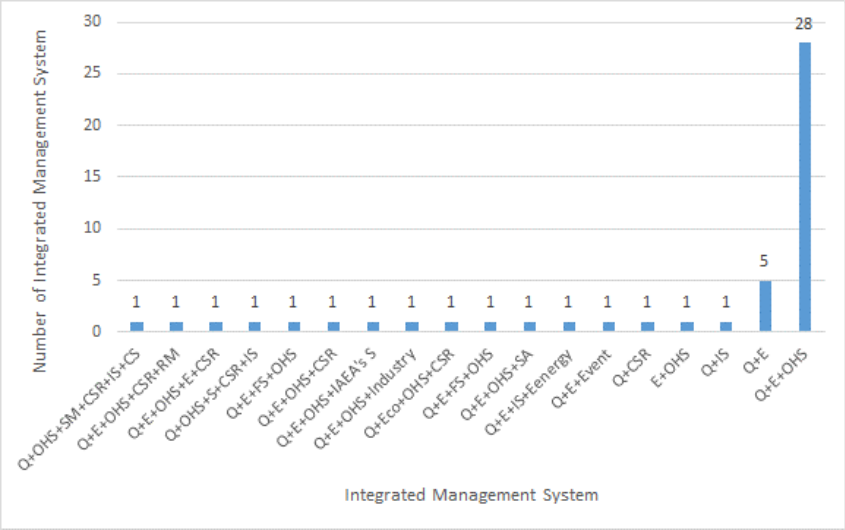

Figure 2. Distribution of IMS Frameworks

The two most widely used IMS frameworks were selected from 18 IMS frameworks, as shown in Figure 2. The Quality, Environmental, and Occupational Health and Safety (Q+E+OHS) framework was the most widely used IMS framework, with a usage rate of 84.85%, as shown in Figure 3.

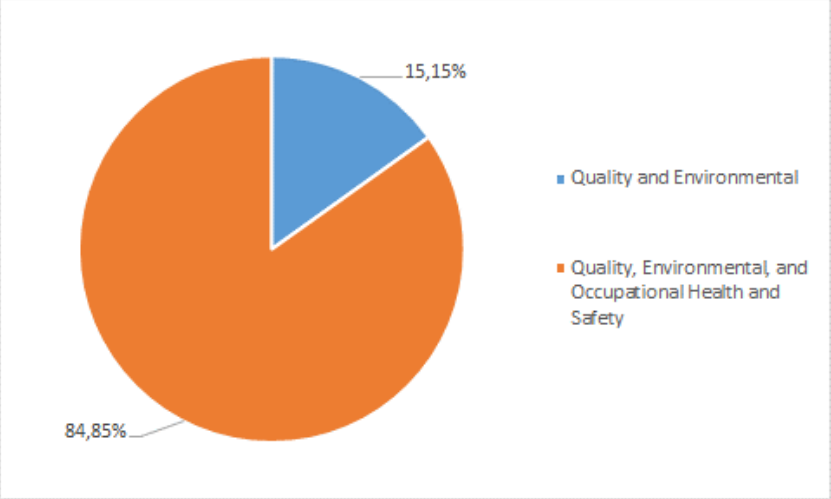

Figure 3. Distribution of Most Applied IMS Frameworks

The cases selected in this research include seven Electric Power Transmission Units owned by Indonesian Electricity State Enterprises with different models and locations, so that the differences can be compared and understood [13]. Currently, there are three models of Electric Power Transmission Units in Indonesia. Hereafter, these units are referred to as "companies" in this research; to maintain confidentiality, the companies are numbered 1 to 7. The Transmission Master Unit (companies 1, 2, and 3) is the first model, and the Load Control Center Unit (company 4) is the second model. The third model is the Transmission Master and Load Control Center Unit (companies 5, 6, and 7). The drivers and structures behind IMS implementation across all companies are further explored in the following sections.

According to external influences, most companies stated that the needs and expectations of interested parties are the drivers of IMS implementation. Interested parties whose needs and expectations must be met include consumers, parent companies, government regulators, interest groups, and society as a whole. The needs and expectations of interested parties must be taken into account in the implementation of an IMS, as these can significantly influence acceptable company behavior to achieve and maintain profitability.

In addition to external influences, internal factors are also one of the drivers of IMS implementation. The majority of companies claimed that activities and related processes were the key internal determinants in the implementation of an IMS. These factors, which are regarded as internal factors since they are under the company's control, have an effect on whether the IMS is successfully implemented or not. These activities and related processes ensure that the IMS is implemented efficiently and effectively, providing the features and capabilities required to satisfy the needs of the company. Table 1 below shows the drivers of IMS implementation.

Table 1. Drivers of IMS Implementation

Companies	Drivers			
	External Influences	Internal Factors	Business Sector	Business Size
1	The needs and expectations of interested parties	Resources	Affected by business sector	Affected by business size
2	The needs and expectations of interested parties	Activities and related processes	Affected by business sector	Affected by business size
3	The needs and expectations of interested parties	Activities and related processes	Affected by business sector	Affected by business size
4	The needs and expectations of interested parties	Activities and related processes	Affected by business sector	Not affected by business size
5	Competition and globalization	Corporate performance	Affected by business sector	Not affected by business size
6	Climate change	Corporate values	Affected by business sector	Affected by business size
7	The needs and expectations of interested parties	Activities and related processes	Not affected by business sector	Affected by business size

Regardless of the business sector and business size, most companies state that it has an effect on IMS implementation. This is because the business sector associated with the electricity business is a vital and highly regulated business sector, while the size of the business is related to the scope and complexity of IMS implementation as well as the resources required.

Furthermore, regarding the structure of the IMS implementation in the company under research, the IMS implementation structure consists of the IMS framework and the person in charge. The IMS framework can be different according to the data from IMS certificates and IMS manual documents. Meanwhile, the person in charge of IMS in the company is the Business Process Owner (BPO). Most companies appoint an IMS specialist/senior specialist to be the BPO for IMS implementation. The IMS team or Asset manager, on the other hand, continues to assist with implementation. The term of specialist/senior specialist refers to the expert staff of the company's leader and a non-structural position in the company's hierarchy.

According to data from the IMS certificate, the Quality, Environmental, and Occupational Health and Safety (Q+E+OHS) framework is the most widely used across all companies. Company 1 is an exception to this criterion because it has not yet implemented a quality management system, and company 6, which has not yet undergone IMS certification. Similar to the data from the IMS certificate, the Quality, Environmental, and Occupational Health and Safety (Q+E+OHS) framework is the most widely applied across all companies based on the data from the IMS manual. Exceptions to this criterion are company 4, which has not integrated an Environmental management system, and company 1, which has not integrated a Quality management system but has integrated laboratory requirements. Table 2 below shows the structures for IMS implementation.

Table 2. Structures for IMS Implementation

Companies	Structures		
	IMS Frameworks (based on IMS Certificate)	IMS Frameworks (based on IMS Manual)	IMS Business Process Owners (person in charge)
1	A+E+OHS	A+E+OHS and LAB	IMS Specialist/Senior Specialist and IMS Team
2	Q+E+OHS	Q+E+OHS	IMS Specialist/Senior Specialist and Asset Manager
3	A+Q+E+OHS	A+Q+E+OHS and ERM	IMS Specialist/Senior Specialist and Asset Manager
4	Q+OHS	Q+OHS	IMS Specialist/Senior Specialist and IMS Team
5	Q+E+OHS	Q+E+OHS	Asset Manager
6	Not yet certified	Q+E+OHS	IMS Team
7	Q+E+OHS	Q+E+OHS	IMS Specialist/Senior Specialist

* Note: A = Asset Management System; LAB: Laboratory Requirements; ERM: Enterprise Risk Management.

The Quality, Environmental, and Occupational Health and Safety (Q+E+OHS) framework used by most companies in this research is similar to that found in most recent research worldwide. They are the best known and most widely used management systems, and they are the ones that address the emerging challenges that affect every company. By integrating the three management systems, a company can manage the interrelated parts of its business to achieve its objectives. These objectives relate to product and service quality, operational efficiency, environmental performance, and workplace health and safety.

5. Conclusion

IMS implementation is an effective way for the Electric Power Transmission Units in Indonesia to meet the needs and expectations of interested parties and manage related activities and processes while considering the business sector and size. IMS implementation in the Electric Power Transmission Units in Indonesia has followed the development of best management practices but still needs to be developed further so that it is more standardized.

Implementation should be carried out at the parent company level (strategic level) so that the IMS framework and those in charge at the Electric Power Transmission Unit are more standardized. The recommended minimum IMS framework for the Electric Power Transmission Unit is the Quality, Environment, and Occupational Health and Safety (Q+E+OHS) framework, which is supported by the institutionalization of the person in charge in the hierarchical structure of the company so that it is more accountable and has a bigger share in strengthening the implementation of IMS.

The limitations of this research are the lack of quantitative data about IMS maturity level and key performance indicators regarding Quality, Environmental, and Occupational Health and Safety impacts. Therefore, further research could investigate strategy and evaluation for IMS implementation. The strategy is related to the stages, methods, and levels of IMS implementation. While the evaluation is related to measuring the IMS maturity level and its impact on the key performance indicators.

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