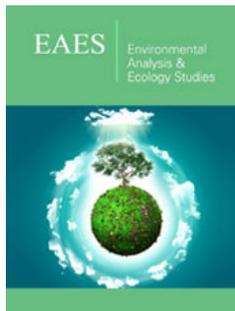


Lean Environmental Management Integration System (LEMIS)

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Introduction

The world of business is facing different challenges and changes in both macro and microenvironment. Development in technologies offers both challenges and opportunities for businesses. However, on the other hand, it also offers different challenges and threats, particularly in the aspect of those related to the environmental issues, which is becoming more and more popular in the global industry. Management practices in the recent days have undergone rapid transformations owing to global changes taking place. The focus of organizations have been on increasing operational efficiency, reducing costs, enhancing quality levels, ensuring steady profits and meeting customer needs. Therefore, Lean Environmental Management Integration System (LEMIS) has been developed. LEMIS model is an integration of Environmental Management System, Lean Principles and ISO 14001.

The model is designed and developed to create the standards for measuring and evaluating the organization's performance. The model makes the environmental efforts of the organization more focused and its goal attainable by the adoption of realistic approach. This model aims to eliminate wasteful processes encountered in the implementation of the ISO 14001 standard, which leads to progress the environmental performance of the organization. Moreover, they make the standard more actionable through the establishment of an action plan with specific roles and responsibility to implement it and a waste free manner. Lean and ISO 14001 standard integration requires the application of Lean principles into the implementation of the standard. Figure 1 shows the LEMIS framework development steps and it divided into 6 phases.

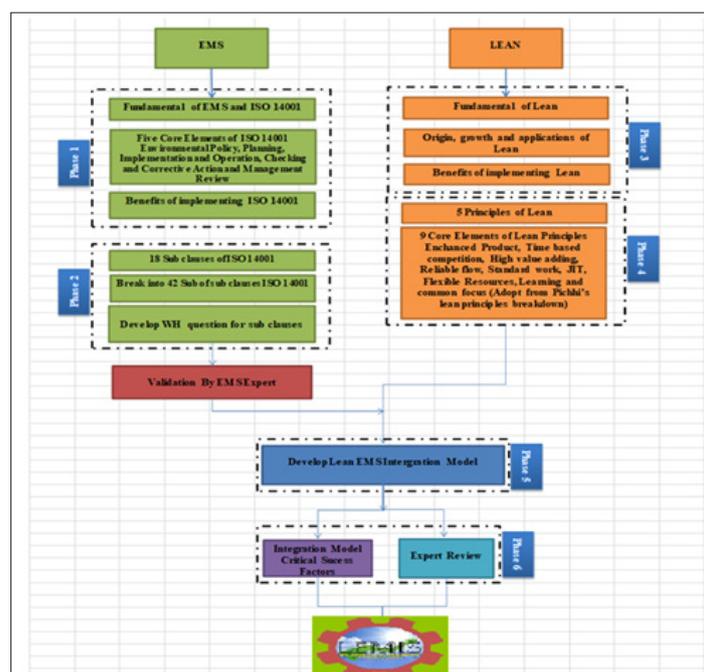


Figure 1: LEMIS framework development flow.

Development of Lemis

Phase 1 (Requirements of EMS and ISO14001)

The collections of data in Environmental Management System are retrieved from the journals, magazines, paper review, dissertations and the report. Literature review is used to categorize the elements of phase. Requirements of data, critical factor, continuous improvement and sustainability of an element are the important factors of ISO 14001 standards. The characteristics of the standards and the importance of the sustainability are led by the researcher.

Phase 2 (Refinement of ISO 14001 standards)

The phase 1 information is act as a base for phase 2. The ISO 14001:2004 clauses are classified from 18 main clauses to 42 sub clauses. It determines the expanding result of the clauses and hence it is considered as the easily understandable factor. It establishes the relationship between the clauses and the sustainability standards. The WH question method is used in these 42 sub clauses and it helps to perceive the better standards of ISO 14001.

Phase 3 (Lean requirements)

Review of papers, books, magazines and reports of the requirement are explained the data collections on Lean in phase 3. Effort of Literature review helps to analyze the steps in the phases. Requirements of data, sustainability elements and success critical factor are the relevant elements of the Lean principles which are associated in this phase. This phase produces lot of information which may be useful for the researcher for further integration.

Phase 4 (Refinement of lean principles)

Phase 4 denotes that five principles of lean are subdivided into nine core elements. This sub- division helps to attain the better vision towards the principle.

Phase 5 (Lean core elements and the sub clauses integration ISO 14001)

Core elements of Lean principles and the ISO 14001 are integrated the 42 sub clauses in this phase. Each sub clauses of ISO 14001 are associated with the core elements of lean principles in order to perform the integration process. There are two types of representation such as row and column. Core elements of lean principle are represented by the columns whereas the 42 sub clauses of ISO 14001 are represented in the form of rows.

Phase 6 (Framework critical success factors (CSF) and validation of framework)

Final phase of the LEMIS framework development analyzed the Critical Success Factor (CSF) by using the literature review and the collected preliminary data through the questionnaire survey. EMS experts and lean are declared the development of framework. The declaration of the framework is analyzed by the eight experts from the related fields. The methodology of the focus group is used in this phase.

Conclusion

Model based design and is an established approach for management of the company. For these model to support decision making relating to creation of elaboration or good services of the industries. The research still contains some limitations. Firstly, the research primarily emphasizes on the services organizations and production environment. Secondly, the research can be further improved through a larger population with several types of organizations to realize the implementation of lean values in ISO14001 application. Besides that, the improvement of the structure can be done in the future study once the linkage has been examined and identified. The study can be applied in the ISO 14001 certified firms in different countries with this framework and the victory of the lean philosophies and ISO 14001 incorporation can be measured.

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