

Principles and Business Improvement Initiatives of Lean Relates to Environmental Management System

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Abstract

Lean and Environmental Management System (EMS) are widely appreciated by organizations in improving business efficiency and productivity. The distinct systems have worked towards the enhancement of business capabilities, reducing production costs and meeting ISO standards. This paper analyzes these two systems and provides an understanding of how these processes have contributed in improving business efficiencies. Past research studies have revealed that there are wide ranging possibilities and scope of expanding the application potential of these systems to provide even better business models. The research study aims to provide an understanding of the individual systems and then goes on to explore the possibilities of integrating the two models to provide an effective approach to achieving organizational efficiency.

Keywords: Lean, EMS, ISO 14001, Integration, Business Improvement.

Introduction

Management practices in the recent days have undergone rapid transformations owing to global changes taking place. The focus of organizations has been on increasing operational efficiency, reducing costs, enhancing quality levels, ensuring steady profits, and meeting customer needs. The efforts of the management in the recent times have been on enhancing productivity through efficient methods of production that emphasizes on the elimination of unnecessary procedures and processes that add to production costs. The efficiency of production process is determined by the optimal use of resources and adopting an environment friendly production method. Environment management systems or EMS has been the focal point of managerial strategies in most organizations today.

EMS practices within an organization need to be integrated with exiting organizational practices to realize its true potentials. Research studies have revealed that majority of organizations focus more on gaining market competitive advantage, improving customer relations, and increasing profit potentials than adopting work processes that satisfy environmental safety and policy requirements.

Lean is one such business model that focuses on delivering quality products to the customer at reduced cost of production. The principles of Lean are founded on understanding of customer needs and demands, eliminating non-value added activities from the production process, involving the workforce in resolving operational issues, define metrics for measuring organizational performance, assist in decision making process and problem solving (Ross & Associates report, 2004).

Purpose and objective of research

The application of EMS and Lean within firms can help in overcoming operational challenges and improving business efficiency. Both systems are different in scope and approach but integrating the systems can help organisations achieve excellence in business performance and meet EMS objectives. The researcher proposes that organisational work processes can be effectively streamlined for improved efficiency and performance through adopting an integrated system that combines the benefits of both EMS and Lean. The research paper provides an insight into the various aspects of EMS and Lean practices within the organisation and how it can be integrated to enable organisations to improve business efficiency. The objective of the research paper hence is to identify the scope of integrating EMS and Lean systems to enable firms in achieving greater degree of business efficiency.

Scope of research

The scope of the research is limited to defining and analysing the systems and application of EMS and Lean within any organisation. The paper explores the various aspects and dimensions of EMS and Lean systems, their approach and impacts on organisational performance, efficiency and productivity with the objective of finding the possibilities of integrating both for enhanced performance within firms. The research focuses on providing an understanding of the conceptual framework behind the two systems and its application within the organisational environment. This involves the study of why ISO 14001 is not sustainable, what measures can be taken to make it more sustainable, and what are the prospects of integrating Lean with EMS systems. Based on the findings of the research the paper will provide recommendations on effective practices and system implementation issues that can help organisations in creating a sustainable business model.

Literature Review

Environmental Management System (EMS)

In the 21st century, there is great emphasis on companies and businesses to contribute towards protecting the environment as part of their corporate social responsibilities. Companies need to adopt measures to protect and enhance the environment in order to maintain good relations with customers, suppliers and vendors. There is a growing need for businesses to fulfill their corporate social responsibilities in order to survive in the global economy. Environment management system (EMS) can help the company in fulfilling their responsibilities towards protecting the world environment (Gbedemah, 2004). An EMS provides the framework to manage the company's environmental

responsibilities effectively and also helps in integrating the environmental initiatives into the day to day operations. An efficient EMS is critical to all types of business irrespective of the nature, size and scale of operations. In the global market, it is important for manufacturing, automobile, retail and service industries to have an EMS in place. An effective EMS contributes to cost savings and reduces the environmental liabilities (Cheremisinoff, Rosenfeld, & Rosenfeld, 2010).

A company that has a good EMS in place will be able to satisfy the needs of suppliers, customers, employees, investors, regulatory bodies and environmental groups. This will help in boosting the image and reputation of the company in the marketplace. An EMS is defined as a part of the management system of the business in which the objectives, plans, policies and procedures relating to its environmental responsibilities are defined. It provides a basis for identifying, evaluating, managing and sustaining the company's contribution towards the environment. EMS ensures that the measures taken towards environmental protection are implemented in the organization and the company meets its environmental goals. It also helps in ensuring that employees, suppliers and vendors understand their role in the environmental policy and contribute effectively towards meeting the environmental objectives of the organization (Visser, Matten, Pohl, & Tolhurst, 2010).

ISO 14001 standard and principles

ISO 14001 is an internationally accepted standard that sets out the steps to be taken by a business to put in place an effective EMS (EPA, 2002). It helps in integrating the environmental goals into the overall operations of the company. ISO 14001 standards was written with consensus of nearly 50 countries and more than 100 countries have endorsed it as an international standard. ISO 14001 is applicable to all types of organizations with varying nature and size of operations. It is also relevant to companies with different risk profiles. It is easily adaptable either to an entire organization or a specific function (Woodside & Aurrichio, 2000).

The International Standards Organization (ISO) first published ISO 14001 in 1996. Since then, organizations worldwide have implanted the standard in their operations. There could be various reasons for a company to implement ISO 14001. It helps in promoting a green corporate image and boosting market share. ISO 14001 helps in minimizing waste and thus reduces the costs involved in managing waste. It also helps in reducing insurance and prosecution risks. ISO 14001 helps in gaining investor confidence and brings in more ethical investment (Whitelaw, 2004).

Lean system

Lean is a tool for process improvement that aims at maximizing customer value and minimizing waste (Miller, Pawloski, & Stanridge, 2010). Lean helps in focusing on key processes that affect the output to the customer. It focuses on continuously improving the process management elements to deliver maximum value to customers. Lean helps in achieving the organizational goals with fewer resources and zero waste. Lean does not focus individually on systems, tools,

technologies, assets and functions. It works at optimizing the process flow across assets, systems, technologies and functions to deliver the best value to customers (Lean Enterprise Institute, Inc., 2009).

Earlier, lean principles were thought to be relevant only to manufacturing companies. This is no longer true. Lean can be implemented successfully across all industries. For an organization implementing lean, it is enough to just adopt a few principles only for certain processes. This will not have an impact on the performance of the company. To reap the full benefits of lean, the company must adopt it as part of their business strategy (Turbide, 2005). This will result in lean principles being implemented consistently across all the functions in the organization and will have a positive impact on the overall performance.

Lean should be adopted as a way of thinking and as a way of doing business in order to fully enjoy its benefits (Sarkar, 2007). Lean methodology is focused on minimizing waste in the organization's value streams and reducing costs. When lean principles and methodology are implemented strategically, the organization can adopt lean across functions. According to Reidenbach & Goeke (2006, pg 1), "Rather than having cost reduction as the exclusive focus of lean thinking, the conceptual framework of lean also has tremendous potential for increasing top-line revenue by creating a sustainable differential value advantage for the enterprise that deploys the concept in its entirety."

Integrating Lean into ISO 14001

Earlier it was thought that lean and EMS has different objectives and hence cannot be integrated. A company would implement its lean and EMS initiatives separately with a view that the two target different kind of waste. Lean involves implementation of measures for optimizing the process flow and minimizing waste. EMS is aimed at putting policies and procedures in place to reduce the adverse effect on the environment. Subsequently, studies have shown the strong relationship between the lean and green activities in an organization. Both lean and green initiatives share a common goal of reducing wastage. The wastage defined in lean management also has significant environment impact. Implementation of lean principles will have a positive impact on the company's environmental performance. A business should take a holistic approach in implementing EMS and integrate the lean principles to the environmental aspects of the company. Companies should work towards fostering an effective relationship between the lean and green activities to maximize customer satisfaction and minimize waste (Mitsubishi, Ueda & Kimura, 2008).

For the lean principles to be integrated into the ISO 14001 standards in an organization, the environment policy and lean objectives must be clearly defined. A well defined system must be in place setting out the roles and responsibilities of the employees in different departments across various levels. The employees should clearly know what their lean and green goals are and the means to achieve them. This helps in reducing the time and effort spent on searching for solutions (Gordon, 2001).

Studies show that in existence of environment management systems in organizations help in promoting lean management as both target cost and waste reduction. There is also evidence that there is a need for stronger co-ordination and collaboration between the lean and environment management activities. There could be a conflict amongst the goals set for the lean and green efforts. This has to be addressed at the strategic level by the senior management. They should roll out the agenda for the lean and green initiatives that ensure that the goals can be achieved in a co-operative and seamless environment. Employees must be made aware of the advantages in using the lean principles in environment management. They must understand the importance of combining and working on lean and green efforts simultaneously.

The process of integrating Lean into the EMS is a multi-layered process and involves many steps. The first step is listing those areas of function in the company which has the largest environmental impact. The business should ensure that the Lean principles are integrated into those processes that impact the environmental performance. The next step is creating awareness amongst the employees about the Lean and green efforts of the company. Employees must be made to feel that their company does really care about the environment and not merely undertaking to implement EMS for ISO certification. They must be able to see and understand the vision of the company in integrating Lean principles into ISO 14001 standards. Employees must be fully aware of the course of their actions and their environmental impact. It is only with this understanding that organisations can get the full support and participation of the employees in integrating Lean principles into the EMS (Gordon, 2001).

The company should work on integrating the EMS requirements into the existing systems. If a separate process flow is created for EMS, there could be issues of lack of coordination between the environmental measures and other processes. As a result, it is important for organisations to integrate the Lean and green efforts into its day-to-day operations. The environmental control should be decentralized in the organisation. Each function or department must have environmental goals as part of their operational agenda. This means that there will be efforts made towards positive environmental impact from all parts of the organisation. In communicating the ISO 14001 standards to the employees, it is very crucial to use simple language to enable understanding at all levels. It is only when employees understand what the ISO 14001 standards necessitating will they be able to implement in their routine functioning. There should be cross functional interaction and cooperation in integrating Lean and green efforts. The company should encourage collaboration between offices at different locations in implementing ISO 14001. Different offices can help one another in integrating Lean principles into ISO 14001. Best practices followed by each unit in implementing EMS can be put together and be communicated on a company level.

Methodology

The research design is one of the key factors determining the effectiveness of the research study. If the research method

applied does not meet the needs of the research objectives the findings and analysis of data collected is wasted. The selection of appropriate research method is based on an improved understanding of the research objectives and research questions that define the scope of study (Malhotra & Birks, 2006). The research method must enable the researchers to gain a broader perspective on the research issue and provide a supportive framework to the findings and solutions. This section provides an overview of the research methods adopted during the course of the study and the justification of adopting the chosen methods.

Any research work is guided by five principles of research design that include the identification of research goals and objectives, planning the conceptual framework to develop the research arguments, establishing the research questions, decide on the methods to be used for data and information collection, and validating results for purpose of accuracy and relevance to the research context (Maxwell, 2005). The exploratory research study involved the use of qualitative research method for collection of vital data and information that contributed to the inferences from the findings.

The research method adopted for this paper combines both primary and secondary data collection process. The findings and subsequent analysis of the research study is based on the primary and secondary data collection process. The choice of research method was based on the appropriateness of the research context that warranted a practical insight into the implementation issues and challenges facing the application of Lean and EMS within the organization. This complemented the conceptual framework and analysis provided by the secondary research method. The research study on the effectiveness of Lean, EMS, and effective integration of both systems within businesses needed an exploratory perspective that helped the researcher in using theoretical frameworks to explain and understand the significance of the systems and their scope of application. The primary and secondary data collection process contributed to the research study by enabling the researcher to highlight significant aspects related to Lean and EMS and analyzing the possibility of expanding business performance and efficiency by integrating the two systems.

For the purpose of gaining an in-depth knowledge and understanding of key areas of focus and analysis the research process included extensive study of available literature, previous research study papers, journals, periodicals, and information database. The information retrieval process included electronic search of existing database, journals, literary sources, and research papers completed by other researchers on similar subject matters. The literature review summarized the evidence collected from various secondary sources to enable an understanding of the scope, benefits and application of Lean and EMS systems.

The primary data collection process involved the use of questionnaires for the purpose of gaining a practical insight into the research issue. The questionnaire followed a simple format using open ended questions to enable the respondents to provide their views and experience on the research context. Open ended questions are useful in eliciting a detailed response from the respondent and can be effective in gaining

useful insights into the research study. The questionnaire was designed for the purpose of gaining an insight into the issues and challenges related to the implementation of Lean and EMS within manufacturing and service industries. The sampling unit chosen for filling up the questionnaire constitutes of managers and executives in various industries. The participants were selected on a random basis. A total of 15 respondents were selected for the sampling unit. The questionnaires were emailed to the respondents and the participants were asked to fill in their responses in the online forms. The filled in responses were sent back by email. The online mode of participation in the primary data collection process proved to be effective owing to its time saving feature and ease of participants since they filled up their responses at their convenience.

The questionnaire comprised of 5 questions that focused on gaining evidence of the possibilities of integrating the two systems and the envisaged benefits to business growth and productivity.

Q1. Do you think that Lean can add value to EMS systems? If yes, how?

Q2. Do you feel that Lean and EMS can be integrated to provide businesses with improved performance and enhanced productivity?

Q3. What according to you are the primary benefits of using the Lean and EMS systems within the business?

Q4. Identify some of the pertinent issues and challenges facing effective application of these systems within the organization?

Q5. What measures according to you can be taken to overcome such issues for effective implementation of these two systems?

The research study was limited in its scope in terms of the small size of the sampling unit. 15 respondents are not enough to provide a collective view of the practical insights associated with the use of Lean and EMS systems. However, it served to provide vital data related to practical benefits and challenges facing the application of the systems. The findings of the research process are outlined and presented in a structured format in the results and analysis section of this report.

Findings

The findings section provides an overview of the responses of the participants to the questionnaire given to them. The opinions and information provided by the respondents provided a base for further analysis and discussion on the research study.

The research findings have been tabulated below for an improved understanding of the evidence collected:

Can Lean add value to EMS?

In response to the first question all the respondents felt that Lean can add extensive value to the EMS by eliminating non value addition processes and adopting tactical methods of eliminating waste. These involve the use of popular Lean methods such as kaizen, Just in Time (JIT), and Total Productive Maintenance (TPM). The findings strongly emphasize that an organization pursuing Lean principles can

effectively reduce costs of operation, enhance quality standards and respond to customer needs that translate to improved business performance. The application of EMS with Lean can help organizations in identifying potential waste in areas of manufacturing or resource allocation that can help in creating an optimized production system that is highly efficient and productive.

Table 1: The research findings from the Questionnaire.

Questions	Respondent briefings
Can Lean add value to EMS systems?	98% of the respondents felt that Lean can add value to EMS systems
Lean and EMS integration for improved productivity	97% felt that Lean EMS integration can enhance productivity and performance
Primary benefits of using the Lean and EMS systems	Sustainable growth and development combined with improved productivity and streamlined work process
Issues and challenges facing effective application	Lack of adequate leadership and managerial support for effective implementation
Strategies for overcoming such issues for effective implementation	Participative leadership approach, employee empowerment, and adequate resource mobilization

Lean-EMS integration

A majority of the respondents felt that the integration of Lean and EMS can result in highly efficient and effective systems that focus on value addition strategies. The effectiveness of integrating the two systems can be realized by adopting processes and procedures designed to eliminate waste and create an economically sustainable work environment. This can help organizations in optimizing production costs and meeting organizational goals and targets through a continual improvement process that reviews existing practices and recommends enhanced procedures to drive competitive growth in industry.

Benefits of Lean-EMS integration

The benefits of integrating Lean-EMS systems were widely appreciated by all respondents who felt that each of the systems individually served to enhance the production processes within the organization. The goals of each system may be distinct in terms of their contribution to the environmental objectives and optimized production processes. Hence an integration of both the systems can enable organizations to achieve environmental objectives, safety conditions, and profitability of business by streamlining of work processes.

Issues and challenges facing Lean-EMS integration

Lean and EMS integration requires planned coordination and strategic implementation methods to be effective, according to a majority of the respondents. The major challenges facing an effective integration according to the findings of the primary research study were identified as lack of managerial capabilities within organizations to lead the changes within the existing system. Change management requires able and effective leadership, focused planning, forecasting and implementing strategic moves for realizing

the true potentials of the integrated approach. Managerial and leadership capabilities who understand the essentials of the principles and practices related to Lean and EMS.

Overcoming issues and challenges to effective Lean-EMS integration

The respondents felt that the potential challenges and issues facing effective Lean-EMS integration can be overcome by adopting a well-considered implementation strategy and change management principles. This requires creating an awareness of the integrative approach and its benefits among the workforce, emphasizing the benefits of the proposed changes, training the workforce on the proposed systems, and ensuring employee participation in driving the change objectives.

The findings of the primary research process draw the significance and potentials of integrating Lean-EMS systems for building an efficient organization. The effectiveness of such systems is widely influenced by management practices that drive organizational commitment to international standards of quality and optimized production capabilities.

Discussion

The subsequent discussion focuses on the management systems that can be adopted towards an effective Lean-EMS integration for enhanced efficiency in operations. The study has highlighted the significance of Lean-EMS systems within organizational environment and its contribution to meeting organizational goals and creating a sustainable business model. However, the integration of Lean and EMS can present increased challenges to the organizations in the form of implementation strategies, identifying the true potentials of the systems, and creating awareness among the workforce on the changing practices and procedures at workplace. “If Lean manufacturing can serve as catalyst to Green manufacturing system implementation, then this relationship could have a profound effect on the means by which Green manufacturing systems are promoted by agencies such as the EPA” (Bergmiller & McCright, 2009). Research studies have focused on the collective benefits and operational efficiency that an integration of these two business principles can lead to organizations (Bergmiller & McCright, 2009).

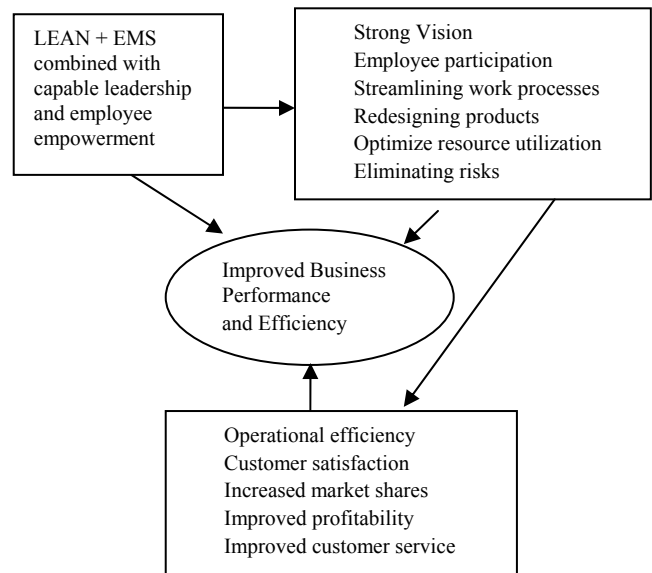
The effective implementation of Lean systems within organizations depends to a large extent on the leadership capabilities within the organization and employee involvement. Lean manufacturing methods are based on “specifying the value, identifying the value stream, flow, pull and perfection” (Bergmiller & McCright, 2009). Value in this context refers to the perception of goods and services by the customer. Analyzing the value stream or the customer value of specific goods and services can help organizations in identifying the wasteful resources or processes adding to the production costs. This helps the organizations in meeting market demands without spending or wasting resources on extra production of goods and services.

The EMS functions on similar lines though the objectives are focused on meeting the international quality standards laid down by ISO Management Standards. The EMS principles and practices are based on the fact that organizations must

review their operations at regular intervals to assess if the existing practices are contributing to organizational goals and complying with global standards of quality. “Though the EMSs of different organizations vary widely in details, all usually include an environmental policy statement: an initial review, environmental objectives and targets, implementation procedures, internal monitoring and auditing; and internal reporting” (OECD, 2001). Documentation of work procedures are effective means of implementing such standards and enabling effective monitoring of such systems.

The Lean-EMS integrative approach must take into account that the differences in the management systems and draw a business model that focuses on adopting the best of both worlds. The lean and green business model must be based on a strong vision and strategic plan that is based on employee involvement, empowerment, streamlining work processes, redesigning products, optimize resource utilization, eliminating risks, expanding to new markets, and waste management practices. The diagrammatic representation of the business model below illustrates the co-relation between different variables and impact on business efficiency.

Figure 1. LEAN and EMS integrative approach business model



The effectiveness of such business models can be realized in the form of increased customer satisfaction, operational efficiency, and improved profitability, enhanced market shares, and improved customer service.

Implementation plan for the proposed model

The implementation plan for the proposed model focuses on collaborating management efforts and strategies towards the desired organizational goals and objectives. One of the key aspects determining the success of implementation efforts lies in the ability of the management to communicate its vision and persuade a change mechanism that focuses on gaining employee participation to the proposed changes. Hence the implementation plans is developed around building a strong vision for the workforce and elaborate training programs that create an awareness of the need for the

proposed changes, the change initiatives, and the potential implications on different work processes and departments. The training workshops will focus on improving employee involvement and participation in the change program through feedbacks, open discussions and presentations that will illustrate the scope of the desired changes and its implications.

Communication is yet another vital aspect influencing the success of the proposed business model since it impacts the organizational culture and its flexibility to adapt to emerging business needs. Management focus on transparency of communication is critical for ensuring employee participation and acceptance to the proposed changes. Employee involvement initiatives can be effectively led by process improvement teams and feedback programs that elicit employee suggestion and observation. This requires able leadership and team work efforts that focuses on building a strong and unified organizational work culture. Assessment of employee performance through well defined performance indicators and evaluation procedures can help reinstate employee confidence and trust in managerial capabilities.

Conclusions

The integrative approach business model has distinctive benefits since it lends the organization with the capability to expand its operations through streamlining of processes and compliance with ISO standards. This can lead to effective business results and creating a sustainable organization that is based on the proven management models of Lean and EMS. The research study has investigated the possibilities of exploiting the benefits of both the systems and adopting an effective business model that improves business efficiency and productivity. However, the potentials of Lean and EMS integration remain vastly unexplored since changes within the business environment and innovative technologies can widely impact operational processes and procedures. Future research studies can expand on the evolving technology implementation to provide improved models that can simplify work processes and exploring managerial mechanisms of Lean and EMS integration.

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