

## **Structural Equation Modelling Based Approach to Integrate Customers and Suppliers with Internal Practices for Lean Manufacturing Implementation in the Indian Context**

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**Abstract :** Lean management is an integrated socio-technical system to bring about a competitive state in an organization. The purpose of this paper is to explore and integrate the role of customers and suppliers with the internal practices of the Indian manufacturing industries towards successful implementation of lean manufacturing (LM). An extensive literature survey is carried out. An attempt is made to build an exhaustive list of all the input manifests related to customers, suppliers and internal practices necessary for LM implementation, coupled with a similar exhaustive list of the benefits accrued from its successful implementation. A structural model is thus conceptualized, which is empirically validated based on the data from the Indian manufacturing sector. With the current impetus on developing the industrial sector, the Government of India recently introduced the Lean Manufacturing Competitiveness Scheme that aims to increase competitiveness with the help of lean concepts. There is a huge scope to enrich the Indian industries with the lean benefits, the implementation status being quite low. Hardly any survey-based empirical study in India has been found to integrate customers and suppliers with the internal processes towards successful LM implementation. This empirical research is thus carried out in the Indian manufacturing industries. The basic steps of the research methodology followed in this research are the identification of input and output manifest variables and latent constructs, model proposition and hypotheses development, development of survey instrument, sampling and data collection and model validation (exploratory factor analysis, confirmatory factor analysis, and structural equation modeling). The analysis reveals six key input constructs and three output constructs, indicating that these constructs should act in unison to maximize the benefits of implementing lean. The structural model presented in this paper may be treated as a guide to integrating customers and suppliers with internal practices to successfully implement lean. Integrating customers and suppliers with internal practices into a unified, coherent manufacturing system will lead to an optimum utilization of resources. This work is one of the very first researches to have a survey-based empirical analysis of the role of customers, suppliers and internal practices of the Indian manufacturing sector towards an effective lean implementation.

**Keywords :** customer management, internal manufacturing practices, lean benefits, lean implementation, lean manufacturing, structural model, supplier management

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