

The Reliability of Mechanical Systems (ImechE Guides for the Process Industries)



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Validity and reliability of lean manufacturing frameworks

An empirical study in Indian manufacturing industries

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Abstract

Purpose – The purpose of this paper is to investigate, validity and reliability analysis on existing Lean manufacturing (LM) frameworks when applied to Indian organizations. LM is one of the best manufacturing strategies that are used by manufacturing plant managers to improve manufacturing capabilities.

Design/methodology/approach – In the present research work, a questionnaire-based survey was used to examine 35 LM frameworks. The study targeted respondents ranging from top- and middle-level management personnel in Indian manufacturing industry. The sample includes organizations in a variety of industries ranging from automobile, electronics, engineering, process and textile industries products. The survey tool was prepared with team of 12 members i.e. six academicians and six professionals from manufacturing industry environment. The study received 186 responses from various sectors of manufacturing industry, 180 surveys were usable resulting in a response rate of 23.90 per cent. Factor analysis was conducted to check unidimensionality of the framework. Cronbach's alpha is calculated to find reliability of each framework's. Lastly, frequency analysis was used to recognize familiar constructs of LM on the chosen framework.

Findings – This study has identified that most of the LM frameworks revealed a high level of reliability. When the study has examined further advance about unidimensionality with respect to the construct, i.e. the LM it measures, it confirmed 11 frameworks were revealing unidimensionality. The frequency analysis was evident that a greater part of the constructs has a high mean score and mode. Finally, the research concludes that there is requirement for a novel framework to Indian manufacturing industry to stay in competition with global manufacturing industries.

Research limitations/implications – Cross-sectional data from manufacturing industries and India (only one country) is used with sample size restricted to 180 only, and it would be interesting to test these frameworks for more than one industry sector and country.

Practical implications – The present work tries to find the suitability of the presented LM frameworks to Indian manufacturing industry sector. The authors hoped that the present research would give the information to the management to execute the suitable LM framework in their firm.

Originality/value – The present work tries to find the suitability of the presented LM frameworks to Indian manufacturing industry sector. The authors hoped that the present research would give the information to the management to execute the suitable LM framework in their firm.

Keywords Lean manufacturing, Reliability, Just-in-manufacturing, Frameworks, Indian manufacturing industry, Validity

Paper type Research paper



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