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A Multi-Objective Methodology for Selecting Lean Initiatives in Modular Construction Companies

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Abstract : The implementation of lean manufacturing initiatives has produced significant impacts in improving operational performance and reducing manufacturing wastes in the production process. However, selecting an appropriate set of lean strategies is critical to avoid misapplication of the lean manufacturing techniques and consequential increase in non-value-adding activities. To the author’s best knowledge, there is currently no methodology to select lean strategies that considers their impacts on manufacturing wastes and performance metrics simultaneously. In this research, a multi-objective methodology is proposed that suggests an appropriate set of lean initiatives based on their impacts on performance metrics and manufacturing wastes and within manufacturers’ resource limitation. The proposed methodology in this research suggests the best set of lean initiatives for implementation that have highest impacts on identified critical performance metrics and manufacturing wastes. Therefore, manufacturers can assure that implementing suggested lean tools improves their production performance and reduces manufacturing wastes at the same time. A case study was conducted to show the effectiveness and validate the proposed model and methodologies.

Keywords : lean manufacturing, lean strategies, manufacturing wastes, manufacturing performance, optimisation, decision making

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