# Adaptive analytical approach to lean and green operations

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**ABSTRACT**

Recent problems faced by industrial players commonly relates to global warming and depletion of resources. This situation highlights the importance of improvement solutions for industrial operations and environmental performances. Based on interviews and literature studies, manpower, machine, material, money and environment are known as the foundation resources to fulfil the facility's operation. The most critical and common challenge that is being faced by the industrialists is to perform continuous improvement effectively. The needs to develop a systematic framework to assist and guide the industrialist to achieve lean and green is growing rapidly. In this paper, a novel development of an adaptive analytic model for lean and green operation and processing is presented. The development of lean and green index will act as a benchmarking tool for the industrialist. This work uses the analytic hierarchy process to obtain experts opinion in determining the priority of the lean and green components and indicators. The application of backpropagation optimisation method will further enhance the lean and green model in guiding the industrialist for continuous improvement. An actual industry case study (combine heat and power plant) will be presented with the proposed lean and green model. The model is expected to enhance processing plant performance in a systematic lean and green manner.

**KEYWORDS**

Lean & green manufacturing; Lean and green index; Back-propagation; Machine learning; Process optimisation

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