Keywords: Manufacturing systems, Production planning and scheduling, Single large object placement problem, two-dimensional cutting, genetic algorithms.

P0164

Use of Mathematical Programming in the Improvement Phase of Six Sigma's DMAIC Approach for a Pipe Manufacturing Company

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Logistics is efficiently planning, implementing and controlling materials in the supply chain, services and information flow. Competition of companies is raised by improving logistics processes. To reduce transportation and to eliminate waste that does not add value to the products and to deliver the products to customers in a short time leads to reduced logistics' costs and improved customers' satisfaction. Therefore, companies should optimize their logistics processes. This paper deals with the reduction of transportation costs of a pipe manufacturing company. For this purpose, lean six sigma DMAIC approach is utilized and its results are analyzed. In the improve phase, one of the proposals is to generate a mathematical model and make use of its results. The purpose of the mathematical model is to evaluate the free areas in the plant as a stock area using containers. The model is solved via Mathematical Programming Language (MPL). In addition, the model has the flexibility to be applied to many similar logistics problems. It is shown that the model is very useful with its flexibility and it provides efficient alternative solutions for the improvement phase of the six sigma approach.

Keywords: Lean six sigma, DMAIC, logistics, reducing transportation costs, mathematical models, MPL

P0165

Changeover time and its variability reduction through SMED-Kaizen approach: Case study of an Indian steel pipe manufacturing unit

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Steel pipes are manufactured from hot rolled steel strips which are progressively formed into circular sections by feeding through successive rolling units. The edges are joined by high frequency induction welding (HFIW) process and the protruded weld beads are trimmed to obtain smooth surface finish. It has a wide variety of application ranging from boiler and automobile components to structural and plumbing accessories. Higher product variants and low volume of each type requires frequent changeover of forming rolls and cumulatively it leads to major throughput loss. Single minute exchange of dies (SMED) is an effective lean tool that reduces non-productive set up time by streamlining the changeover activities based on a systematic guideline. However, it does not ensure the reduction in variability