Productivity Improvement in Bus Passenger Seat Assembly Cell through Lean Methodology

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Abstract:

Lean is the term used to describe the production system developed by the Toyota company in the post World War II years. "Lean" comes from the ability to achieve more with less resource, by the continuous elimination of waste. The basic idea is to reduce the cost systematically throughout the product and production process by means of a series of engineering reviews; and to increase productivity. Productivity improvement is a challenge to every industry. The project was carried out at Harita Seating Systems Ltd. The problem formulated in this project originates from the practical problem that the company faced in meeting customer demand. The inspired customers of Harita Seating Systems Ltd. have raised the production demand which could not be fulfilled with the existing facility.

The intended outcome of this project was to increase the productivity in the Bus Passenger Seat Assembly cell in order to meet customer demand and also to provide a back-up plan to meet demand fluctuation. The project work was started by data collection, followed by investigating the root cause of the problem. The Lean tools such as Value Stream Mapping, and Cellular Manufacturing were used for solving the problem. The major wastes were identified and it was decided to change the layout of the assembly cell by considering various factors such as Takt time, cycle time, and product flow and floor space. (Space utilization, material travel distance, material handling cost etc.). Alternate layouts were generated using lean layout concepts such as 'group technology' and 'systematic layout planning, which facilitate relocating the stations accordingly. A suitable layout with efficient space utilisation and effective material handling was selected. This selected layout was validated and recommended for implementation.

The outcome of the project was that the productivity in the Bus Passenger Seat assembly cell increased by 20%; i.e. from 176 seats to 220 seats per day (8 buses to 10 buses per day (22 seats per bus)). The company is now able to meet the customer demand and the new layout design has enabled to set-up an extra assembly line, which serves as a back-up in case of demand fluctuation and unforeseen breakdown.