PERFORMANCE IMPROVEMENT IN APPAREL MANUFACTURING USING LEAN TECHNIQUES

by

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Abstract

The labour productivity in the Sri Lankan garment industry is found to be rather low compared to that of some of its competitive countries. On site investigation revealed that the workflow gets unbalanced due to many reasons despite it is balanced at the commencement of a new style. The Work In Progress (WIP) and its fluctuation are found as two apparent factors reducing the labour productivity in addition to disorganized set-up activities during style changes. The significance of the problem of high WIP and its high fluctuation are investigated through the data collected from 42 garment manufacturing lines in 14 different factories. Hypothesis testing on these data revealed that this is a common problem across all 14 factories under this study. Root cause analysis on WIP fluctuation disclosed the major contributing factors to the problem. Identifying each sewing line in few "sub-cells" where a team of operators focuses mainly on one part of the garment helped addressing most of the problems identified in the root cause analysis. An algorithm to balance the production line and the sub-cells is devised. The concept was successfully implemented in a garment manufacturing company in Sri Lanka. The evaluation of the performance indicators revealed that the production efficiency has increased by more than 10% while drastically reducing the defect percentage. The operator absenteeism too has significantly reduced. This may be due to the fact that the operators' motivation to work and their income are increased as disclosed by the results of the questionnaire survey among operators and the supervisors.

High, but inevitable, style changes aggravate the problem of low labour productivity as drastic production efficiency drops are experienced during the changeover. The quick changeovers concepts commonly found in lean manufacturing and newly proposed five step set-up procedure streamlined the set-up activities. The implementation of the proposed set-up procedure made it possible to increase the average first day production efficiency of the factory over 80% and a significant reduction in the set-up times as compared with the statistics before implementation.