

The Impact of Quick Change Over on Overall Efficiency in Garment Manufacturing: A Case Study

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Abstract

Quick Change-Over (QCO) is commonly used in lean production to reduce time wastage in garment manufacturing. The change over time of a new style is a non-value-added time. It also highly impacts on the factory's overall production efficiency. Past data indicated that the overall production efficiency of the selected factory was more than 70% without styles change overs achieved QCO. Thus, the main objective of this study was to investigate the impact of QCO on the overall production in garment manufacturing. Identifying the relationship between line feeding time and machine pre-setting date with the first three-day QCO achievement was the secondary objective of the study. The sample size was 134 new style change overs. Amongst this, only 74 styles were QCO passed. Quantitative study with correlational design was used to identify the impact of QCO towards overall production in a garment manufacturing company. The analysis process consisted of two main steps. The relationship between keeping the first three-day QCO efficiency into the correct order by handling machine preset date according to the schedule date and change over time occurring within one hour was the first step of the research. The second step analyzed the effect of the factory corresponding to three days production efficiency by handling the first three-day QCO efficiency according to the correct order. Chi-square test of Independence and simple linear regression model were used in the data analysis. The results showed that machine pre-set date and change over time had a significant impact on the QCO achievement during the first three-days. Moreover, the results showed that QCO fail styles and two days QCO fail styles had negative impacts on the factory production efficiency. The R-square value of the fitted model explained 50% of the variability created by internal factors. The variable QCO fail had -0.394 coefficient value implying that a 1% increase in the QCO fail styles causes a 39.4% decrease in the overall production efficiency. Relevant folders and parts for the external machines layout are prepared before the line feeding and fixed them to the internal machines in new layout with in first hour of style change over, trial runs are performed to observe the results, develop new motion methods to improve efficiency and investigate the possibility to implement parallel operations for machines are the recommendation of the study.

Keywords: *Garment manufacturing, lean manufacturing, overall production efficiency, quick change over*

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