

# **Preliminary Study on the Identification, Analysis and Elimination of Lean Manufacturing Wastes through Lean Manufacturing Practices at Yarn Manufacturing Industry**

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## **Abstract**

This case study is conducted at the yarn manufacturing (spinning) mill of Sindh, Pakistan about the implementation of lean manufacturing (LM). LM is new to the process industries and especially in yarn manufacturing industry. Though few studies are conducted in garment sector but these are very limited. As per my knowledge, no study was conducted in any spinning mill about the significance of waste of LM and/or to propose LM practices for the reduction of significant LM wastes. The aim of the study was to identify LM practices to minimize waste in yarn manufacturing industry. The objectives associated with this aim are to investigate the significance of wastes of lean in yarn manufacturing industry, to identify and analyze the most significant waste through LM standards and to propose the LM practices to reduce the most significant waste in yarn manufacturing industry. The study is limited to seven LM wastes only i.e. overproduction, waiting, transportation, inappropriate processing, unnecessary inventory, unnecessary motion and defect. The study is also limited to six yarn manufacturing processes of ring spinning i.e. blow room process, carding process, drawing process, roving process, ring process and winding process. The processes before the blow room and after the winding are not considered. The data is collected from the interviews, observations and discussion methods. The lean wastes are identified in the different areas of the yarn manufacturing process. The wastes are investigated and the appropriate lean practices are suggested. Initially the Waste Relations Matrix (WRM) is used to investigate the significance of wastes of lean. The most commonly used tool for identification of lean wastes i.e. “Gemba Walk” is adopted to get the details of most significant waste. The statistical tools are adopted to get the data of the most significant waste from each section of the yarn manufacturing industry. Defect waste is identified as the most significant and inventory is the least significant waste which also affect other lean wastes in the yarn manufacturing industry. Lap licking in blow room, irregular sliver in carding, irregular sliver in drawing, irregular sliver in combing, irregular roving in roving, improper bobbin build in ring and ribbon wound cone in winding are the most occurring defects in the yarn

manufacturing industry. Andon, jidoka, poka yoke, standardized work, root cause analysis and lean six sigma are the recommended as the most suitable lean practices to minimize the defect waste in the yarn manufacturing industry. It is recommended that other lean wastes should also be studied in the yarn manufacturing industry and other than the above lean practices should be investigated and explored. The lean wastes and lean practices should be explored in other textile sectors also. The study pattern and study should be referred in other sectors of industries also. The study can be conducted in the other yarn manufacturing industry and other country as well. The similar study can be utilized for the survey of the bunch of yarn manufacturing (spinning) industries and other industries as well.

### **Keywords**

Yarn manufacturing, lean manufacturing, waste identification, waste relation matrix

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### **Biography**

**Muhammad Ali Khan** currently works as Assistant Professor in the Department of Industrial Engineering and Management, Mehran UET, Jamshoro, Sindh, Pakistan. He has sixteen years university teaching experience. He has supervised more than a dozen theses at undergraduate level. He is pursuing his PhD in the same department. He has completed his Bachelor of Engineering, Post Graduate Diploma and Master of Engineering in Industrial Engineering and Management. He has also completed his MBA in Industrial Management from IoBM, Karachi, Pakistan. He has authored various research papers for conferences and journals. He has participated in many professional seminars, workshops, symposia and trainings. He is registered with Pakistan Engineering Council and many other professional bodies. He does research in diversified fields of Industrial Engineering. The current projects are related to Lean manufacturing, Six Sigma, Project management, Operations management; MIS and Entrepreneurship. He has also earned various certifications in his areas of research.

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