Integrating Lean Manufacturing and Simulation Modelling to Improve the Productivity of a Door and Window Manufacturing Plant

Thalia Nair and Oludolapo Akanni Olanrewaju
Department of Industrial Engineering
Durban University of Technology
Durban, South Africa
21610228@dut4life.ac.za, oludolapoo@dut.ac.za

Abstract

Manufacturing companies are striving to compete in the global markets and to remain profitable. Through increased productivity, manufacturing companies compete or remain competitive in global markets. Lean manufacturing techniques have proven to improve the productivity of manufacturing companies. This technique identifies and eliminates all forms of waste from manufacturing plants and processes. This study aims to apply lean manufacturing to a manufacturing plant to increase productivity. The company selected manufactures wooden and aluminum doors and windows and has limited knowledge and application of lean manufacturing. The data was collected from time studies. Simul8, a simulation modelling software was used to analyze the impact of implementing lean manufacturing. The results indicated an increase in throughput and an improvement in the company's overall productivity. The integration of lean manufacturing and simulation modelling was found to improve productivity in this manufacturing plant.

Keywords
Lean manufacturing, simulation modelling, lead time, work-in-process.

Biographies

Thalia Nair has graduated with a Bachelor of Engineering Technology Degree in Industrial Engineering at the Durban University of Technology, South Africa. She is currently a Production Control and Logistics Graduate at Faurecia, Port Elizabeth. Her interests include however, not limited to lean manufacturing, biogas technology, simulation modelling, autonomous vehicles and rapid prototyping.

Oludolapo Akanni Olanrewaju is currently a Senior Lecturer and Head of the Department of Industrial Engineering, Durban University of Technology, South Africa. He earned his BSc in Electrical Electronics Engineering and MSc in Industrial Engineering from the University of Ibadan, Nigeria and his Doctorate in Industrial Engineering from the Tshwane University of Technology, South Africa. He has published journal and conference papers. His research interests are not limited to energy/greenhouse gas analysis/management, life cycle assessment, application of artificial intelligence techniques and 3D Modelling. He is an associate member of the Southern African Institute of Industrial Engineering (SAIIE) and NRF rated researcher in South Africa.