

## **Optimization of Electromechanical Assembly Line by Using Six Sigma and Lean Process Improvement Methodologies**

**S. Bhojak, R. Agurla, Z. Wang, D. Won, C. Cheng, J. Deng,  
D. L. Santos, M. Khasawneh, and K. Srihari**

Department of Systems Science and Industrial Engineering,  
State University of New York at Binghamton  
Binghamton, NY, USA

Corresponding author's Email: [sbhojak2@binghamton.edu](mailto:sbhojak2@binghamton.edu)

**Abstract:** To attain maximum productivity and higher yields in the current competitive global environment, every firm needs to enhance its processes through continuous improvements. This paper's primary objective is to eliminate non-value-added activities and track downtime in the electronic packaging business. Therefore, the study concentrates on applying DMAIC (Define, Measure, Analyze, Improve, and Control) and Lean concepts, such as Kaizen, 5S, brainstorming, value stream mapping, line balancing, and standardization of work processes, to accomplish the goals of efficient productivity with the highest quality of the product that meets the customers' demands. The prime focus of this paper is to eliminate the lean wastes of DOWNTIME, namely defects, overproduction, waiting, not utilizing talent, transport, inventory excess, motion waste, and excess processing. Moreover, downtime for the processes has been analyzed by performing data analytics by extracting relevant data from machines. As a result, a significant increase, nearly 140%, in the units per hour has been achieved.

*Keywords:* DMAIC, Lean, Downtime, Data Analysis