

A fuzzy approach for minimization of defects in a production line by controlling input parameters: A case study in Bangladesh

Jannatul Bushra

Department of Engineering
BGMEA University of Fashion and Technology
Dhaka-1230, Bangladesh
jannatul.bushra@buft.edu.bd

Department of Systems and Industrial Engineering
University of Arizona
Tucson, USA
debashisdas@email.arizona.edu

Md. Habibor Rahman

Department of Systems and Industrial Engineering
University of Arizona
Tucson, USA
habiborrahman@email.arizona.edu

Abstract

Product quality is of supreme importance in any food processing industry. Usually faulty products are discarded through proper inspection. But this inspection requires additional resource deployment while the cost of rework and machine downtime also pose potential threat by interrupting the production process and thus often cause loss in revenue. Although zero defect is a promising concept for better production planning and control, in many food processing industries the defect in product can't be avoided completely. But even if the defects can be controlled, can be minimized, it would be highly beneficial for mass production. This paper presents a methodology to define the number of defective or bad quality products in a food processing plant as a dependent function of various input parameters during the production process. Fuzzy logic and multiple linear regression analysis are used to determine the impact of the input parameters on the quality of the product. Finally, with the help of Pareto analysis, some possible solutions are provided for minimization of defective items.

Keywords

Defect Control, Production Planning and Control, Fuzzy Logic, Multiple Linear Regression.

Biographies

Jannatul Bushra is a Lecturer in the Department of Engineering at the BGMEA University of Fashion and Technology, Dhaka, Bangladesh. She earned B.Sc. in Industrial and Production Engineering from Bangladesh University of Engineering and Technology (BUET), Bangladesh and currently pursuing Masters in Industrial Engineering at BUET. Her research interests include mathematical programming and model development, sequencing, scheduling, simulation and optimization. She is a member of Institute of Engineers, Bangladesh.

Debashis Das is currently pursuing PhD in Systems and Industrial Engineering at the University of Arizona. He is a former lecturer in the department of Industrial Engineering at the BGMEA University of Fashion and Technology. He also served as an assistant engineer at Abul Khair Steel, Bangladesh. He completed his B.Sc. in Industrial and Production Engineering from Bangladesh University of Engineering and Technology. His research interest includes modelling, simulation, forecasting and optimization.

Md. Habibor Rahman completed both B.Sc. and M.Sc. in Industrial and Production Engineering from Bangladesh University of Engineering and Technology. He is going to start his PhD in Systems and Industrial Engineering at the University of Arizona from fall 2018. He is a lecturer in the Department of Mechanical and Production Engineering at Ahsanullah University of Science and Technology, Bangladesh. He has published a few journal and conference papers. His research interest includes inventory models, risk mitigation, disruption management, additive manufacturing, quality control and optimization.