Sustainability Performance Model: A Case Study of Pneumatic Nipple Hose Connector

H. A. Salaam, M. S. H. Jaman and R. Junid

Faculty of Mechanical and Manufacturing Engineering, Universiti Malaysia Pahang, 26600, Pekan, Pahang Darul Makmur, Malaysia

Abstract:
Sustainability concept was first introduced by Dr Harlem Brundtland in 1980's promoting the need to preserve today's mother nature for the sake of our future generations. There are three main evaluation criteria's involved in sustainability approach namely economics, environmental and social. In consumer product manufacturing industry, the economics criteria are measured by consider the total manufacturing costs where it evaluates the economic sustainability of a company in a long term. The impact to the environment during manufacturing process can be used to measure the environment criteria. The social criteria are complicated to evaluate. But focusing at production line workers' health who works at the production line can be used to evaluate the social criteria because it gives direct impact to their performance. In this paper, the sustainability concept is applied at the production line in the production of a pneumatic nipple hose connector. The evaluation criteria which has been considered are total manufacturing costs, environmental impact, ergonomics impact and also energy used for manufacturing. This study involves machine learning optimization by using neural network model which carried out in two stages. The first stage is to predict the results based on experimental works. The second stage is by using inversed neural network model to determine the optimum cutting parameters so that it can be used to manufacture the pneumatic nipple hose connector. Through these stages, optimization of the manufacturing procedures to produce pneumatic nipple hose connector already considered the criteria for sustainability.

Keywords: Sustainability; Economics; Environmental; Social; Performance model

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