

Simulation of a propose new model that integrate variable value stream mapping with a risk assessment tool

There are limited studies being done that include risk assessment when calculating lead time in manufacturing process. This study proposes a model that integrates Variable VSM (V-VSM) with Risk Assessment- Failure Mode and Effect Analysis (RA-FMEA). Each process needs to define the best fit probability distribution. Value Stream Mapping (VSM) was used in determining total throughput time, cycle time (CT) and lead time (LT). Information on Value added activities (VAA) and Non-value-added activities (NVAA) within the process need to be identified and mentioned prior to VSM analysis. Monte Carlo simulation with @Risk software was then used for the model. The simulated result produces values for (minimum, most-likely(mean), maximum) time values of total CT/LT and risk value for management to deploy in planning raw material order, VAA/ NVAA, Work in Progress (WIP), process layout and shipment schedule. Validation of this proposed model was done using a real case study involving a small /medium scale manufacturer producing several mixes of powdered drink. This paper will focus on the modelling of V-VSM and RA-FMEA for Monte Carlo simulation using @ Risk software.