

Development of a Network DEA Model to Measure Production Line's Performance: A Case Study for Automation and Labor Combination

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Abstract

Nowadays, growth of industry can be seen as a nature of the world. Each company race again each other to increase productivity to produce new, high quality and product that fulfil customer demand. One can achieve the Key Performance Indicator (KPI) or targeted goal but without considering the cost, manpower, time or others elements is inefficient toward productivity. In this paper, we studied the effectiveness of production line that equipped with automation to determine whether the return of investment for automation is worth compared to output obtained. We apply Data Envelopment Analysis (DEA) to measure efficiencies of production line where DEA is one of excellent tool that can evaluate efficiencies and have been use widely in many sectors. As a case study, this research focuses on the production line that producing a product with a high and continues demand in order to observe how the investment on automation can give a good return or not and continue to see investments return profits automation done or not. We observed the performance of the production line that combined the automation and the labour using Network DEA model. Our observation found that the company can save production time by 35-40 percent in producing the product.