

## عنوان مقاله:

Machine efficiency measurement in industry ۴.۰ using fuzzy data envelopment analysis

## محل انتشار:

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## خلاصه مقاله:

Industry ۴.۰ implementations are competitive tools of recent production systems in which complex computerized systems are employed. Efficiency of these systems is generally measured by Data Envelopment Analysis (DEA) under certainty. However, the required data in modelling the system involve high degree of uncertainty, which necessitates the usage of fuzzy set theory. Fuzzy DEA models can successfully handle this problem and present efficient solutions for Industry ۴.۰ implementation. In this paper, efficiency of Industry ۴.۰ applications is measured by classical DEA and fuzzy DEA models, allowing the variables to have different units of measurement and to be independent from analytical production functions. Besides that, fuzzy algorithms for output-oriented DEA are proposed for BBC and CCR models. To the best of our knowledge, this article is the first quantitative academic study to measure the effects of Industry ۴.۰ applications on productivity. It also shows how fuzzy factors can affect decision-making by comparing fuzzy and classical DEA results. A real application of the models is realized in a company of home appliances manufacturing sector having Industry ۴.۰ applications. The effect of Industry ۴.۰ implementation on machine productivity, and superiority of fuzzy DEA over classical DEA are shown through the application

## کلمات کلیدی:

Industry ۴.۰, Fuzzy Data Envelopment Analysis, Efficiency, Home appliance production

## لینک ثابت مقاله در پایگاه سیویلیکا:

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