

An approach to maintenance sustainability level assessment integrated with Industry 4.0 technologies using Fuzzy-TOPSIS: A real case study

Patalas-Maliszewska, J.^{a,*}, Łosyk, H.^a

^aInstitute of Mechanical Engineering, University of Zielona Góra, Poland

ABSTRACT

Sustainable development (SD) activities within a manufacturing should be integrated with the Industry 4.0 (I4.0) technologies implementation due to ensure the continuous evaluation and even prediction the SD level. Such integration should be provided cross all company areas but must be strictly defined for each core process realised within a company. Therefore, the main purpose of the study is to build the new approach to assess the maintenance sustainability (MS) level in a manufacturing company, as a good example of integrating I4.0 technologies and SD activities within a company, using Fuzzy Technique for Order of Preference by Similarity to Ideal Solution (F-TOPSIS). The major contributions of the work are as follows: 1) to the existing literature by identification the key objectives of MS, in the context of Industry 4.0 2) using the F-TOPSIS method and based on the empirical data received from 125 Polish manufacturing enterprises, 3) the establishment of the integrated approach, which allow continuous monitor the level of the MS within a manufacturing, 4) demonstrating the usefulness of the fresh framework in managerial practice through its verification in the five Polish manufacturing companies. Managers of manufacturing enterprises, thanks to the use of the proposed approach, may assess and constant monitor the MS level, while application of the I4.0 technologies.

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*Corresponding author:

j.patalas-maliszewska@iim.uz.zgora.pl
(Patalas-Maliszewska, J.)

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