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Topic of Research : Implementation Issues and Framework
Development for Industry 4.0

Finding

A comprehensive understanding of Industry 4.0 (I4.0) is developed by covering Its evolution, enabling technology, complexity and other aspects followed by its impact areas.

For implementation issues, first, the barriers are identified and ranked by Best-Worst Method. Massive investment and the availability of robust IT infrastructure are among the most prominent barriers. The 16 barriers are segregated into technological, economic, socio-economical and economical categories. These 16 implementation-barriers are further narrowed down into six prominent ones by implementing PCA-Fuzzy-AHP-K-means. Results strengthen the earlier findings: the economic category is the most influential.

Cellular manufacturing (CM) is underlying in I4.0, and the understanding of CM would help in I4.0 implementation. The case of Meerut Sports Goods Manufacturing (SGM) Industry, largely operating on I2.0 practices, was first studied from CM implementation aspects with ISM and MICMAC analysis of its enablers and barriers. It leads to new aspect of compatibility of current devices and solutions in the new era. It is followed by developing a DEMATEL based I4.0 Transformational framework for the SGM Industrial cluster.

Every automated system is not coming under the category of the I4.0 system. To sum up, the availability of all I4.0 features, an Automation Comparative Parameter under the name 'I4.0 value' is proposed. It would help in comparing the I4.0 system.

For helping in retrofitting and upgradation decisions, the concept of the transformability index (TI) is introduced. A procedure to calculate the value of the TI and relative TI is proposed. The proposed transformability procedure may be extended to transform the system from a regime to any other regime.

The Classification Scheme, Automation Comparative Parameter, and Transformability are the novelty of the study. The study adds new dimensions to the existing literature and opens new avenues for further research.