Guest Editorial Preface

Advanced Multi-Criteria Decision-Making Approaches Application Towards Sustainable Development of Industry 4.0 Sectors

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The compilation and integration of digital technological architectures under traditional production system have evolved the concept of Industry 4.0 (Asongu and Roux, 2017; Luthra and Mangla, 2018). In present era, industry 4.0's production systems have built the industrial sectors more dynamic and robust to effactually address the future marketplace competition and defies (Thoben et al., 2017; Brettel et al., 2014). The digital technological architectures add the production system greater efficiencies and build the great relationships among vendors, manufacturers, and customers as well (Luthra and Mangla, 2018; Hofmann and Rüsch, 2017) Digitization and implicating smart manufacturing tactics are the need for today's industry. Industry 4.0 defined a new level of organization and stresses on implicating control mechanism over to the entire value chain of manufacturing stuffs (Gröger, 2018; Bibby and Dehe, 2018). Multi Criteria Decision Making (MCDM) is an advanced field of operations research (Sahu et al., 2017; Wanga et al., 2019), which assist the Industry 4.0 sectors from several perspectives such as assessing sustainability of modern vendors, assessment of equipments utility, evaluation of parts manufacturing firm's status and others (Malviya and Kant, 2017; Khan and Maity, 2017). MCDM can effectively find elevated results under complex scenarios by comprising diverse indicators, conflicting objectives and criteria (Mi et al., 2017; Tupenaite et al., 2010),. The same assists in structuring complex problems considering multiple criteria's and leads to determining better decisions (Sahu et al., 2020a; Sahu et al., 2020b). MCDM methods robustly enrol effectual means for contrasting resulting rankings (Macharis and Bernardini, 2015; Barfod et al., 2011). MCDM methods in decision making best synchronizes influential parameters (Guhnemann et al., 2012; Jessop, 2014), and can be used to evaluate economic and environmental indicators (Sahu et al., 2018; Sahu et al., 2014).

The special issue embrace its existence by logging towards various means, analytical tools, framework for optimally allocating and advancing dimensional arena of Industry 4.0 and related elements. This special issue provides notable insight towards better understanding of business ecosystem under the aegis of Industry 4.0 through numerous means and modes. The main intension of the special issue is to implicate the conceptual arena of intelligent MCDM techniques towards the

Industry 4.0 sectors, logging towards smart supply smart networking, automating smart manufacturing and monitoring provisions, data analyzing and machine learning, cloud computing, networking areas to focus on sustainable industry 4.0 architectures, developing supply chain models, frameworks, techniques, ideas, novel concepts etc, to approach towards industry 4.0 development, tracing of current research trends and growth of industry 4.0 supply chain etc. The objective of present special issue 'Advanced Multi-Criteria Decision-Making Approaches Application Towards Sustainable Development of Industry 4.0 Sectors' is to archive research contribution and documents, which could enable the Industry 4.0 sectors more sustainable in future. The special issue stimulated the current scholars/researchers to contribute their research articles for peer review process.

HIGHLIGHTS

The present special issue swung with imaginative, inventive, creative research documents-portfolios. The simulated issue gained the high momentum and procured overwhelming research papers with good sound and agility from researchers, scholars, academicians and practitioners. The special issue (call for paper) "Advanced Multi-Criteria Decision-Making Approaches Application Towards Sustainable Development Of Industry 4.0 Sectors" successfully archived and recorded significance, imaginative, inventive and creative research documents under the portfolio of International Journal of Social Ecology and Sustainable Development. The special issue can assists research production teams, researchers, scholars, academicians to pro-explore, revive, refresh, quench, and optimize their research reminiscence, and brain for obtaining successful business and academies entities via handling the future industry 4.0 defies.

The papers had been evaluated and benchmarked by exploring the online guest editor portal and submission constrained, guidelines and policy of IGI, Global. Due to the high pickup and acceleration of said special issue, 11 papers are respected after vigorous reviews and revisions, appended under volume 12 with issues 2 & 3 to be associated with the library of IJSESD, IGI, Global, USA. The published articles over issues will enforce the future researchers and actuate them to crack and pop the industry 4.0 dilemmas of industries.

THE SUMMARY OF VOL. 12, ISSUE 3

In the first paper, the authors, K. V. Geetha Devi, Sourabh Kumar Singh, Mr. Shailesh Singh Thakur have stresses on process optimization for diminishing the exploitation of resources and to produce sustainable technologies. The aim of the work is to build the proficient Industry 4.0 Green architectures index for assessing the feasible candidate choice. The work exploited crisp numbers set based MOORA-FMF advanced technique for examining the Industry 4.0 Green architectures of vendors firms. The managers are assisted with an Industry 4.0 Green architectures index with optimization technique to quantify the performances of alternatives.

In the second paper, the authors, Debasis Tripathy, Nalin Behari Dev Choudhury and Binod Kumar Sahu studied the LFC issue of a three-area power systems including nonlinearities using Fuzzy-Two Degree of Freedom-PID (F-2DOF-PID) controller optimized with Grasshopper optimization algorithm (GOA). The work considered GOA optimized PID controllers for a two area non-reheat thermal system including generation rate constraint to validate the superiority over PID controllers tuned with recently reported optimization techniques, such as hybrid Firefly Algorithm-Pattern Search, Firefly Algorithm, Bacteria Foraging Optimization Algorithm, Genetic Algorithm and conventional Ziegler Nichols technique. The work verified the supremacy of F-2DOF-PID controller over other controllers such as Fuzzy-PID, Two Degree of Freedom-PID, and PID with GOA framework. The work additionally accounted three-area system to verify the effect of nonlinearities and robustness of proposed controller.

In the third paper, the authors, Neha Verma and Vinay Sharma stated that there is a corresponding and complementary relationship among the three manufacturing techniques/processes Lean, Green and Six-Sigma in premise of industry 4.0. The work can assist the managers for big data analysis of industrial wastes/by products and its corresponding influences over industries. The said work focused its attention on 'greening' through life cycle assessment to fill this gap and to assess the environmental impacts of the generated waste.

In that fourth paper, the author, Dr. Sri Yogi Kottala made an effort on compiling the relevant research articles on sustainable practices. The review based on sustainability in manufacturing, supply chain aspects using the dimensions of sustainability i.e. economic, environment social aspects and sustainable supply chain management performance evaluation is discussed. The work summarized the relevant researchers work published and suggested some research directions as well as propositions for researchers especially with reference to Indian context.

In the fifth paper, the authors, Ranjan Kumar Behera, Kshira Sagar Sahoo, Debadatt Naik, Santanu Kumar Rath, Bibhudatta Sahoo have utilized various Machine Learning (ML) techniques for predicting the future possible links based on the features extracted from the topological structure. The work implemented various supervised ML algorithms like K-NN, MLP, Bagging, SVM, and Decision Tree for predicting the future possible links. The work identified new links which is likely to appear in the future but currently not exist in the network. The proposed work is validated through various performance metrics.

In the sixth paper, the author, Dr. Siva Shankar Ramasamy provided potential evidence to influence, ICT towards the agricultural sector. In said work, it is demonstrated that Indian agriculture is gradually languishing due to the lack of technological inputs and advancement. It is verified to gather and process information by networking and ICT and accordingly, E-governance is suggested as one of the ways to reach all farmers to promote availability of resources through Information and Communication Technology.

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