
Editorial

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Biographical notes: Kannan Govindan is a distinguished Professor at China Institute of FTZ Supply Chain, head of Intelligent Supply Chain Center and Professor and Head of Center for Sustainable Supply Chain Engineering at the Department of Technology and Innovation, University of Southern Denmark. He has been recognised as a Highly Cited Researcher within 'Engineering' for the three years from Thomson-Reuters. He has published more than 285 journal articles (H-index 100). Many of his papers were selected as the ESI top 1% highly cited papers or 0.1% hot papers or identified and highlighted as the key scientific article. He is serving as executive editor, associate editor, senior editor, area editor and guest editor in many international journals of repute. He serves as an editorial board member of several international journals. His research interests include digital and sustainable supply chain, Industry 4.0 on supply chain, sustainable development goals, reverse logistics and digitalised sustainable circular economy.

Rakesh Kumar Phanden holds a PhD from the NIT Kurukshetra, India and PDF from Cranfield University. He has chaired many technical sessions and organised various conferences. He is a sponsor of the RSP Scholarship Program. He has published two books, edited four special issues and served as an editorial board member for many journals. He has 17 years of teaching experience. He has contributed more than 50 research papers. His areas

of interest include digital manufacturing, CPPS, energy-aware modelling, production scheduling, IPPS and LSS. He has received International Travel Grant from the DST to visit the USA and Canada. He has guided many UGs and PGs and supervised two PhDs.

Basant Singh Sikarwar holds a PDF from the ISU, USA, PhD from IIT Kanpur and MTech from IIT Roorkee. He is the HoD of Mechanical Engineering at the Amity University Noida. He is having 18 years of working experience in teaching. He is working as a PI in many research projects funded from the Government of India, SERB, DST, MSME, DAE, IPR Ahmedabad and from Advance Valve (P) Ltd. Noida, Amber (P) Ltd. Rajpur and Tex (P) Ltd., Gurugram. He has published more than 50 research articles. He worked as an editor of proceedings of many conferences. He worked as a guest editor in various journals. He supervised four PhD candidates.

Vijay Kumar Manupati is working at the NIT Warangal. He holds a PhD from the IIT Kharagpur. His current research interests include intelligent manufacturing systems, cyber-physical systems, sustainable supply chain and healthcare systems. He has published more than 86 publications which include prestigious journals. He is acting as an international reviewer for more than 30 peer-reviewed journals. He received an Early Career Research Grant from the DST. He is a member of the IISE, Institute of Engineers India, life member of International Association of Engineers, USA and also acting as technical committee member of various international conferences.

In the present scenario, industries are facing two challenges simultaneous:

- 1 growing demand of capital and consumer goods
- 2 guaranteeing the social, the environmental and the economically sustainable development of the human being.

These challenges can be overcome by the establishment of the fourth industrial revolution (i.e., Industry 4.0). It provides many opportunities for the realisation of sustainable manufacturing. Therefore, the aim of this special issue was to publish articles presenting the research outcomes, exploring and identifying the research agendas, gaps and opportunities using Industry 4.0 technologies (such as autonomous robots, simulation, horizontal and vertical systems integration, industrial IoT, cybersecurity, cloud computing, additive manufacturing, augmented reality, big data and analytics) to achieve sustainable manufacturing initiative such as economic gains by improving productivity, flexibility, and resource efficiency, environmental gains by reduction of overproduction, waste and energy consumption, social commitments by improving servitisation and stakeholders' engagement, job opportunities, improving the quality of working environment and reducing routine job work.

This special issue published the outcomes of I4.0 and sustainable manufacturing. The articles are contributing to the existing body of knowledge and provide new insights and perspectives on I4.0 and sustainable manufacturing. The authors were invited those were conducting research on a variety of I4.0 technologies in various settings through theoretical and empirical research investigations.

This special issue consists of seven research articles which are much extended version of the papers presented in the 2nd International Conference on "Future Learning Aspects of Mechanical Engineering" (FLAME 2020). Also, the papers submitted by other

renowned authors working on the I4.0 and sustainable manufacturing issues were considered to submit and rigorous review process of *IJAOM* was followed to reach a final decision.

The first paper presents a framework to implement sustainable supply chain management, in second paper, the exploratory study on design principles and key technologies of Industry 4.0 have been discussed in detail. Third paper presents an empirical study of the merit-order effects in the Texas energy market via quantile regression, fourth paper proposed a training methodology based on virtual reality to promote the learning-by-doing approach. Fifth paper presents an innovative framework for lean and green complex manufacturing systems using value stream mapping and the sixth paper present the structural model for barriers associated with the CSR using ISM to help in creating the brand image of the manufacturing industry. In the last paper, authors presented fuzzy inference system in predictive maintenance architecture for broadcasting chain.

Conference FLAME 2020, from which this special issue has been derived, was organised by the Department of Mechanical Engineering at Amity School of Engineering and Technology, Amity University Uttar Pradesh, India, during 5–7 August 2020. Owing to pandemic COVID-19, this conference was held virtually. The primary mission of this conference was to lay a platform that brings together academicians, scientists, and researchers across the globe to share their scientific ideas and vision in the areas of thermal, design, industrial, production, and interdisciplinary areas of mechanical engineering. FLAME 2020 played a key role to setup a bridge between academia and industry. The conference hosted almost 600 participants to exchange scientific ideas. During three days of the conference, researchers from academics and industries presented the most recent cutting-edge discoveries, went through various scientific brainstorming sessions, and exchanged ideas on practical socio-economic problems. Major emphasis was focused on the recent developments and innovations in various fields of mechanical engineering through plenary and keynote lectures. FLAME 2020 has attracted renowned academicians/researchers, noted industry representatives and the delegates from countries like the USA, Sweden, Austria, Russia, Korea, Indonesia, China, Japan, France and India.

We would like to express our sincere thanks to all the authors for contributing their valuable articles in this special issue. Finally, we would like to acknowledge the conference organising committee and reviewers from *IJAOM*, without their expert advice and diligent reviews this special issue would not have been possible.