Editorial

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Biographical notes: Rakesh Kumar Phanden is PhD from the NIT Kurukshetra (India) and post-doctorate from the Cranfield University, UK. He has organised various international conferences namely ICNDME 2014, FLAME 2018, FLAME 2020, FLUTE 2021. He has published three books and edited three SIs for Scopus indexed journals. He is serving as an editorial board member for many journals. He has 17 years of teaching and research experience. He has contributed more than 50 research articles. His current areas of interest include digital manufacturing, production scheduling, IPPS, and Lean Six Sigma. He has guided many BTech and MTech dissertations and supervised a PhD thesis on Lean Six Sigma.

Basant Singh Sikarwar is a Post-doctorate from Iowa State University USA, PhD from IIT Kanpur, India and MTech from IIT Roorkee India. He is heading the Department of Mechanical Engineering at Amity School of Engineering and Technology, Amity University Uttar Pradesh, Noida, India. He has 18 years of working experience. He is working as PI in three research projects funded from Govt. of India, costing INR49 lakhs from SERB, DST India, INR65 lakhs from MSME, DST, INR35 lakh from Department of Atomic Energy through IPR, Ahmedabad and INR50 lakhs from Advance Valve Pvt. Ltd., Noida, Amber Pvt. Ltd. Rajpur and Tex Pvt. Ltd., Gurugram, India. He has published more than 50 research articles. He has supervised three PhDs and six are in process.

Dinesh Khanduja completed his graduation in 1986, postgraduation in 1989 and PhD in 2003 from the NIT Kurukshetra. He has 35 years of teaching and research experience. He has published more than 250 articles and book chapters in international journals and conferences. He has guided many BTech and MTech projects and supervised 18 PhD theses. His research interests include Six Sigma, entrepreneurship development, business incubation, TQM and materials. He has published a book titled *Wrap the Scrap with DMAIC*, in 2015. He is recognised with a Highly Commended Paper Award by *The TQM Journal* (Emerald) for the paper, 'A case study: application of Six Sigma methodology in a small and medium sized manufacturing enterprise', in 2013. He has delivered more than 20 special lectures in workshops/short-term courses and conferences on Six Sigma and process excellence.

Purushothaman Damodaran's expertise is in large-scale optimisation, logistics, simulation, scheduling, lean and Six Sigma. He has developed several mixed-integer linear formulations and novel algorithms to solve decision problems arising in many real-life applications such as feature upgrades for notebook computer manufacturers, cell placement problem in VLSI physical design; scheduling batch processing machines in electronics manufacturing; order acceptance, lot sizing and detailed scheduling in make-to-order enterprises, crew scheduling for cruise lines, railroad scheduling, warehousing and distribution. Much of his research in electronics manufacturing is geared towards eliminating lead from assembly, process improvements and application of lean and Six Sigma principles.

Six Sigma was introduced in 1986 at Motorola, New York. It has been globally accepted for process improvement in healthcare, manufacturing, education, services and many more industries across the world. In today's scenario, these industries are facing challenges to deliver good-quality products and services at competitive prices. Lean methods reduce waste and non-value adding activity and enhance the effectiveness of resources used. Six Sigma tools help in decision making based on data which finally reduces the variability in the process. Both tools are used in combination for operational excellence. The movement towards performance excellence as the operating model of industries is growing at an accelerating pace. This special issue published the outcomes of lean and Six Sigma approaches for process excellence of industries located in India only.

The articles are contributing to the existing body of knowledge and provide new insights and perspectives on the application of lean and Six Sigma methods to organisations of all sizes, in the manufacturing, service and healthcare sectors within India. The authors were invited those were conducting research on a variety of methods for lean and Six Sigma in various settings through theoretical and empirical research investigations.

This special issue (V 13, N 1, 2 and 3) consists of 18 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 lean and Six Sigma were considered to submit and rigorous review process of *IJSSCA* was followed to reach a final decision.

The first paper studies Lean Six Sigma (LSS) imperatives for casting quality improvement of automotive components; in second article, the integration between LSS and Industry 4.0 technologies has been discussed in detail. Third paper presents an approach to improve in performance by desirability coupled with LSS on titanium matrix

composite; fourth paper studies grey relational analysis (GRA) of green LSS critical success factors. Fifth paper presents a case study on implementation of LSS in an Indian manufacturing organisation and the sixth paper explored and investigated the green LSS critical barriers for sustainable performance. Paper seventh integrate Six Sigma and lean for superior sustainability of dairy production. In the eight paper, authors analysed the interactions among lean barriers in new product development. Ninth paper discussed the value stream mapping (VSM) to improve the productivity was presented for a link frame mechanical press manufacturing industry. In the next paper, a case study is presented to reduce the cost of poor quality (COPQ) and to improve the process output using Six Sigma DMAIC. In the 11th paper, a framework is presented to achieve lean in complex production. In 12th article, the authors presented Six Sigma methods for process excellence in wiper motor manufacturing industry. In the next article, the COPQ is explored in auto sector using Six Sigma. In the 14th paper, a framework is presented to implement lean in an agile manufacturing for rolling industry in India. In next paper, authors applied Six Sigma approach to enhance PVC pipe extrusion process. Papers 16 and 17 present the satisfaction of employees in Delhi Metro Rail Corporation (India) and choice of hospitals for customers in an India hospital, respectively. In the last paper, authors presented the comprehensive method for modelling leanness enablers and measuring leanness index in MSME's using integrated AHP-ISM-MICMAC and multi-grade fuzzy approach.

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 socioeconomic 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 *IJSSCA*, without their expert advice and diligent reviews this special issue would not have been possible.