
Editorial

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Biographical notes: Yufeng Zhang is a Lecturer in Operations Management at Birmingham University. His early industrial career included responsibilities for project management, key account management and new business development in the manufacturing and engineering sectors. He continues to work very closely with industry, and have researched and published in the areas of engineering management, network operations, international manufacturing, and technology management.

Saeema Ahmed-Kristensen is a Professor in the Department of Management Engineering, Technical University of Denmark. She conducted her PhD at the University of Cambridge, where she was also an Engineering fellow of New Hall. She leads the Design Engineering and Innovation group, and her research interests focus upon engineering design to develop tools and methods to improve design synthesis, support global product development and provide decision support throughout a product's lifecycle. She has over 80 reviewed publications and works in close collaboration with industry. A multi-disciplinary approach including computer science, engineering and psychology is adopted.

Mike Gregory is Head of the Manufacturing and Management Division of the Engineering Department and Director of the Institute for Manufacturing at the University of Cambridge. He has served in various Government and

Institutional capacities concerned with Engineering and Manufacturing including Advisor to the House of Commons Select Committee Enquiry into Engineering and membership of the former Ministerial Advisory Group on Manufacturing. He is a Fellow of the Royal Academy of Engineering.

Patterns of engineering and manufacturing are changing as major developments in technology and international capability take effect.

Changes to Engineering have included widespread adoption of computer-based design and analysis methods which have dramatically reduced the time and resources necessary to design and engineer even complex products. These developments run across technologies and sectors and are increasingly underpinned by ready access to data and steadily increasing processing power allowing many options to be evaluated before new products move to production.

In production, changes have included much closer connections between design and production technologies so that production technologies can be better characterised and design envelopes accurately determined. Operational changes including lean production and highly connected operational control systems have substantially improved the reliability and responsiveness of factories and production systems.

Service business models have also found much greater favour with manufacturing businesses which recognise the potential for additional value capture and for improved value co-creation relationships with customers. Indeed design and engineering functions are increasingly exploring and designing for service to ensure that appropriate capabilities are built into the earliest stages of a product concept.

Perhaps the most profound recent change however is the globalisation of engineering, manufacturing and service activities as well as their growing interdependence. Globalisation of production is not a new phenomenon but the rapidly increasing capability of emerging countries – most significantly China – has changed the balance of advantage in manufacturing locations and led to globalisation of design and development. There is some evidence that the move of physical production to China has slowed and there are some examples of production returning. Nevertheless the global manufacturing and engineering landscape is irrevocably changed and seems likely to continue to evolve with the emergence of India and Brazil.

Academic work in manufacturing has tended to focus on the design, engineering, production and service activities themselves but it is now wholly inadequate to consider the design and operation of these activities independent of their international context. The traditional engineering management approaches were largely product centred stemming from a rather stable environment but there has been an increasing need to address the complex and dynamic trends of improving integrated products and services operations towards more sustainable products, processes, and industrial systems.

This special issue is devoted to new explorations of ‘High Value Engineering and Service’ by articulating the emerging trends and novel forms of international engineering operations. It recognises that some significant academic contributions have already been made to the study of global production networks but much less attention has been paid to design, engineering and service networks. The research presented here offers new insights into the design and operation of such networks and their links to other parts of industrial ‘ecosystems’. Ecosystem concepts, though still in their infancy offer the promise of much greater connectedness with implications for more rapid and efficient

conception and delivery of new products and services, greater opportunities for the personalisation of products and services and in due course greater participation in the delivery of products and services as new generations of designers and engineers grow up with access to capabilities unimaginable just a few decades ago.

We hope that as well as showcasing some important new research this Special Issue might serve as a focus for a growing community of designers, engineers, producers and service providers all working together to develop the next generation of flexible, responsive and efficient 'high-value' industrial systems.

It was the Chief Editor's continuing support and encouragement that made this Special Issue possible. We are impressed by the thoughtful services, flexibility and patience of the Journal Office team. We must not let this opportunity slip away without properly acknowledging the contribution of the many authors who responded to this call in a timely manner though we are not able to include all the interesting work and high quality manuscripts to maintain a focus on high value engineering, advanced manufacturing and innovation.

We are in debt to those who made a substantial contribution to the special issue, including Anja Maier, David Bennett, David Probert, Don Fleet, Guangjie Ren, Kulwant Pawar, Lihong Zhang, Ming Dong, Mukesh Kumar, Paul Forrester, Rob Phaal, Victoria Hanna, Yongyi Shou, etc. We could have never completed this Special Issue without their insightful comments, useful suggestions, and generosity. We are also grateful to the Seventh Framework Programme of the European Union Marie Curie Actions on Europe-China High Value Engineering Networks (EC-HVEN), which allowed the editors to concentrate on this work and finally complete this Special Issue dedicated to new explorations of international engineering operations.