# Editorial

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**Biographical notes:** Tin-Chih Toly Chen received his PhD in Industrial Engineering from the National Tsin Hua University. He is currently a Distinguished Professor in the Department of Industrial Engineering and Systems Management at Feng Chia University. His research interests include fuzzy and neural computing, competitiveness analysis, cloud and virtual manufacturing, operations research, semiconductor manufacturing, and ambient intelligence.

Zdeněk Mikoláš is the CEO of GM-TREND and Professor and Head of the Department of Entrepreneurship and Management at University of Entrepreneurship and Law of Prague, Czech Republic. He has long been devoted to the issue of economics and business management, entrepreneurship, and business environment.

Yi-Chi Wang is an Associate Professor in the Department of Industrial Engineering and Systems Management at Feng Chia University. He received his PhD in Industrial Engineering from Mississippi State University in 2003. He was the Co-founder of the Society of Lean Enterprise Systems of Taiwan (SLEST). His recent research interests include lean thinking and implementation, production planning and scheduling of flexible manufacturing systems, machine tools assembly, supply chain system simulation, and optimisation of metal cutting conditions.

The competitiveness of a firm, subsector, or country depends on its ability to sell or supply goods or services in a given market. Competitiveness engineering is a systematic procedure including a series of activities that assess and enhance competitiveness. Michael Porter described five forces that influence the competitiveness of an enterprise: the threat of substitute products, threat of established rivals, threat of new entrants, bargaining power of suppliers, and bargaining power of customers. However, these invisible forces mostly come from outside the company, and assessing their impact is difficult. Nevertheless, non-imitable and non-substitutable organisational capabilities and resources have been noted as key sources of interfirm performance differences.

There have been relevant studies in this field, but most of them have focused on the factors affecting competitiveness (such as cost, quality, customer satisfaction, and technical competence) and methods for improving competitiveness (such as balanced scorecard, blue ocean strategy, lean production, green supply chain, and learning organisation). Although competitiveness has been represented as a critical issue, there has been no inquiry regarding what quantitatively constitutes a high or low level of competitiveness.

In today's era of global markets, virtual organisations – including e-businesses, virtual enterprises, financial networks, service networks, and supply/demand chains – are alliances that have been proven to be highly efficient. In addition, the following topics have also appeared in this field:

1 Green competitiveness: Applying strategies for achieving productivity and overall socioeconomic development while maintaining the goal of sustainable development.

2 Sustainable competitiveness: Migration of companies to regions with lower wage levels to maintain a competitive edge.

3 Competitiveness versus productivity: Because competitiveness can lead to wasteful spending, in the context of factories, productivity is crucial.

This critical issue is intended to provide the details for developing advanced methodologies and their applications in assessing and enhancing competitiveness for virtual organisations. This issue features a balance between state-of-the-art research and typical applications. It also provides a forum for researchers and practitioners to review and disseminate high-quality research on advanced methodologies and their applications in the context of competitiveness assessment and enhancement for virtual organisations, as well as to identify critical issues regarding further developments. After a strict review, four articles were included in this study.

To evaluate the environmentally sustainable service competitiveness of a coffee shop, T-A. Chiang and S-T. Wang applied the service blueprint technique to analyse the service process, work time of the direct facilities, and work time of the supporting facilities to estimate the amount of greenhouse gas emission. Subsequently, the holistic performance of the coffee shop was evaluated using the data envelopment analysis (DEA) method.

As global retailers expand their businesses to regions with diverse cultures and consumer preferences, they require advanced e-services linked to in-store digital innovations to remain competitive and sustainable. C.V. Trappey, A.J.C. Trappey, and E. Mulaomerovic studied how cultural dimensions influence consumer attitudes, including uncertainty avoidance and collectivistic cultural dimensions, toward five types of retail innovations. The results showed that Taiwanese consumers prefer innovations with a low level of self-service, whereas Swedish consumers prefer a high level.

In the third paper, M. Qi, S. Carbó-Valverde, and F. Rodríguez-Fernández analysed the diffusion patterns of non-cash payments in China. Based on both exponential and Gompertz curves, point-of-sale (POS) terminals have shown a higher diffusion rate than that of automatic teller machines (ATMs). In addition, the diffusion rate of ATMs was found to be mainly driven by their adoption by rivals, whereas market concentration boosted the diffusion of POS terminals.

In the final paper, S. Lee, J-Y. Hong, and E. Suh established a new framework for assessing the performance of communities of practice (CoPs). They applied the DEA method to analyse knowledge-sharing activities in CoPs, and then classified CoPs into five types on the basis of trends in their efficiency changes.

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