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Guest editorial

Production research in China

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China is the world's largest emerging economy. In recent years, China has moved to an increasingly market-oriented economy that opens to international trade and investment. At the same time, the popularity of China as a manufacturing base, assembling goods for sale worldwide is growing. In addition to global manufacturers who have built their own plants in China, many manufacturing companies are outsourcing production to Chinese subcontractors and branding the products with their own logos. In today's China, production research is becoming more and more important; advanced production research becomes an important enabler to make its manufacturing industry competitive. Although China has different financial, legal, and physical infrastructure, production researchers in China have successfully proven that production research can help to manage global manufacturing competition.

This special issue, 'Production Research in China', aims at reflecting the contributions made by production researchers in China. The issue focuses on the status of production research theory and applications in China in recent years. In the past most production researchers in China published their research results in academic journals in the Chinese language and few Western readers read them. This special issue is intended to provide academic and industry readers in English-speaking

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countries with valuable information on production research in China. In particular, the purpose of editing the special issue is twofold. The first is to introduce the manufacturing research conducted in mainland, Taiwan, Hong Kong and Macao. The second is to provide information regarding production research institutions in China to help Western researchers to locate them.

This special issue is composed of sixteen papers in five clusters. They are:

- Manufacturing process modeling and decision making.
- Genetic algorithm applications in production research.
- Production planning and control.
- Manufacturing strategy.
- Information technology applications in manufacturing.

The topics reflect the recent research trends in China. A number of papers in this issue have special sections discussing the future research trends in particular areas.

In the cluster of 'manufacturing process modeling and decision making', the first paper by Bai and Kwong proposes a fuzzy linear programming technique to process modelling and optimization of epoxy dispensing for microchip encapsulation. Epoxy dispensing is one of the popular processes to perform microchip encapsulation for chip-on-board packages. The second paper by Wong, Chuah and Venuvinod examines the basic issues involved in automated dimensional inspection planning that works within an environment of a generic CAPP support system, and a new algorithmic approach is developed. The third paper by Xu, Li, Li and Tang proposes a polychromatic sets approach for the conceptual design of machine tools. Polychromatic sets theory is a relatively new theory which was originally developed by Russian scientist V. Pavlov only a few years ago.

In the cluster of 'genetic algorithm applications in production research', the fourth paper by Mak, Lau and Wang proposes a genetic scheduling method for virtual cellular manufacturing system. The method has been applied to designing the manufacturing system in a Chinese company which manufactures component parts for internal combustion engines. Then, the fifth paper by Chan, Wong and Chan develops a GA-based grouping and scheduling model to study the impact of machining flexibility on production issues such as job lateness and machine utilization.

In the cluster of 'production planning and control', the sixth paper by Hsu and Su presents an activity-based costing collaborative production planning system to help production planners to estimate the manufacturing profit of semiconductor backend turnkey operational services at the early stage of order release to production line in a collaborative context. The seventh paper by Pearn, Shu and Hsu develops a multi-process performance analysis chart based on process capability indices to analyse the manufacturing performance for multiple processes with a real-world application example.

In the cluster of 'manufacturing strategy', the eighth paper by Wu, Li, Chu and Sculli addresses the outsourcing issue from the point of view of the protection of core competencies during outsourcing. It is known that outsourcing is a strategically important activity that enables an enterprise to achieve both short and long term benefits. The ninth paper by Li develops a strategic operations model that links intermediate infrastructural production decisions and market performance given process choice as a structural constraint for manufacturing firms. The tenth paper by Huang and Liu develops a lean control approach which has been successfully

applied to reduce waste and improve customer service in numerous business enterprises in mainland owned by companies in Taiwan Province. The eleventh paper by Li, Li, Liu and Wang studies the impact of environmental complexity on the choice of management control systems and the effects of management control systems on product development and process decisions.

In the cluster of 'information technology applications in manufacturing: current status and future direction', the twelfth paper by Xu, Zhang, Li and Zhan addresses the digital management as one of Chinese government's top-priority projects to promote the competitiveness of its manufacturing industry. The thirteenth paper by Zhou, Chaudhry, Zhu and Li discusses a financial management system for a cool strip millwork in CIMS environment. The fourteenth paper by Fan, Huang, Wang, and Zhang addresses the architecture and operational mechanisms of networked manufacturing integrated platform. The fifteenth paper by Dan, Li, Zhang, Guo and Zhou discusses a network-integrated manufacturing system from the point of view of manufacturing strategy. Finally, the sixteenth paper by Zhou and Li provides an overview of Chinese manufacturing research institutions, their on-going research projects, and future research topics and directions. Many sources quoted in the paper are originally prepared in Chinese and therefore may provide very useful information to English-speaking readers.

Even in a focused issue, some important research and significant applications may be left out. There may be some advanced theories and working applications in China that have not been included in this special issue due to short preparation time and the limited number of papers that can be published in a single issue. In spite of this, this special issue provides *IJPR* readers with valuable information on the production research in China.

Finally the guest editors are grateful to many individual reviewers who worked with us so diligently. Without their time and efforts, this issue would not have been possible.