Editorial

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Biographical notes: John P.T. Mo is currently a Professor and the Discipline Head of Manufacturing and Materials Engineering at RMIT University. Prior to joining RMIT in 2006, he was a Senior Principal Research Scientist in CSIRO and led several teams including Manufacturing Systems, InfoManufacturing and Infrastructure Network Systems. In his 11 years in CSIRO, his team of 15 professional research staff researched risks analysis algorithms, electricity market simulation, wireless communication, fault detection and production scheduling. He was the project leader for many large scale government projects including productivity improvement in furnishing industry and consumer goods supply chain integration. He obtained his PhD degree from Loughborough University.

Napat Harnpornchai is an Assistant Professor in Knowledge Management at the College of Arts, Media and Technology, Chiang Mai University. He is a Professional Engineer with more than 20 years of experience. He has been involved in structural analysis and design of system components for Don Muang Toll-way project. He has experience in risk and reliability assessment of buildings, infrastructure and seismic assessment using reliability methods. He earned his doctorate degree at the Universitaet Innsbruck and has expertise in engineering project appraisal and impact assessment.

Shuang Cang is a Senior Lecturer at Bournemouth University. After graduating from her PhD study, she worked for a UK software company, UK Government research laboratory and the agency of the government department as Senior Statistician/Senior Analyst, where she applied data mining techniques to solve real and complex problems. She also worked in several UK universities including Exeter University and the University of Wales (Aberystwyth) before joining Bournemouth University. Her research areas are data mining, artificial intelligence, pattern recognition and multivariate statistics. Her tourism-related research interests include tourist impact study, tourism segmentation and tourism demand forecasting.

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Hongnian Yu has held academic positions at the Universities of Yanshan, Sussex, Liverpool John Moores, Exeter, Bradford, Staffordshire and Bournemouth. He has extensive research experience in modelling and control of robots and mechatronics devices, networked control systems, mobile computing, scheduling and simulations of large discrete event dynamic systems. He has published over 200 journal and conference research papers and held several research grants from EPSRC, the Royal Society, and the EU, AWM, as well as from the industry. He has been an EPSRC college member since 2006. He was awarded the F.C. William Premium for his paper on adaptive and robust control of robot manipulators by the IEE Council in 1997. He has graduated ten PhD students and over 30 Master students and has examined over 20 PhD students as both internal and external examiners. Currently, he is supervising eight doctoral students and five Master by research students.

Information and communication technologies (ICT) cover vast areas of technologies such as mobile and wireless technology, telecommunication, software development, security, intelligent systems, etc. ICT has huge impact on everyone's daily life, including industry, researchers, public services, infrastructure and community in general. ICT can be applied to many fields. One of the emerging applications in recent years is ICT in logistics.

Logistics is a process which interfaces and interacts between companies, vendors, customers, carriers, etc. Within the company itself, internal logistics is also crucial in ensuring the flow of materials, goods, staff and support. Logistics is the enabling mechanism for the movement of products from the vendors through to the delivery at the customer's door, including moving through manufacturing facilities, supplies, packaging, warehouses, third-parties, distributors, retailers and more. The purpose of this special issue is to collect the state-of-art researches of ICT in logistics from the perspectives of theoretical development and real-life applications. This issue will cover the research areas such as the lack of available information and visibility in logistics, ICT impact to logistics, information gabs between stakeholders, the current and future challenges that need to be addressed in business and technical applications.

Many manuscripts have been proposed to this special issue, all of them are of high quality. All papers have been carefully reviewed and revised to reflect the breadth and depth of recent researches of ICT in logistics. It has taken a while for the guest editors to finally decide the selection from the submitted papers. Due to volume restriction, five papers are published in this issue.

Since logistics plays an important role in both industry and daily life, and involves many parties in the supply chain, the system needs substantial agility. In fact, agility is a key performance indicator to an effective supply chain. Carvalho et al. (2012) examined 38 cases and established links between supply chain disturbances and corresponding strategies of resilience to counter them. Lemieux et al. (2012) proposed a formal analysis framework to identify key action levers related to supply chain agility, scope of improvement initiatives and targeted objectives. Jie et al. (2012) further developed a method to judge the extent of agility in the supply chain management of the Australian beef wholesale and retail sector. The paper by Mavengere (this issue) examines the roles of IT in strategic agility of the supply chain. Agility is enhanced by the application of ICT to logistics. Improvement of agile systems should be based on quality management principles (Dibia et al., 2012). Mavengere's paper investigated different aspects of IT strategies, in terms of sensitivity and responses. It requires the collective capabilities of

the whole supply chain. The drive to ICT applications in logistics is through strategic development to achieve sustainable system improvement.

Agile logistics aims to improve the processes of product, people and information movements and interactions by providing excellent service to industries throughout the entire supply chain. However, one of the difficulties for managing agile logistics is performance measurement. The main problem with performance measurement is data collection. Some performance metrics have to be assessed from indirect parameters and are difficult to collect, but it is even more important to guarantee accuracy of collected data. Performance measurement issues have been explored by Neely et al. (2003). They found that a potential problem to be avoided when designing performance measures was the movement toward dysfunctional performance caused by the use of dysfunctional measures. The paper by Teimoury et al. (this issue) investigates performance measurement in logistics and suggests an agent based system that automates the acquisition of performance data and assessing the measured values. This is achieved through the identification, classification and codification of performance measurement rules.

Radio frequency identification (RFID) technology is one of the major developments of ICT applied to tracking goods, assets and people movement in recent years. Mishra et al. (2012) assessed RFID usage for mining services. They investigated how RFID technology could be used for inventory management of dangerous consumables in the mines and for safe retrieval of blast debris in the event of a misfire. They found that RFID was affected severely by the presence of rocks or metals in the environment. They applied a hybrid solution that incorporated both near-field and far-field capabilities to improve reliability of determining the explosive materials at predefined locations. Lu et al. (2007) proposed a continuous, all-location, real-time solution for tracking and positioning construction vehicles using global positioning system (GPS) technology and supplementing with RFID when the GPS signals were unavailable or unreliable. Similarly, Kim et al. (2010) applied RFID in the shipment yard of an automotive manufacturing plant to keep track of the vehicles' location until the vehicles were shipped. They developed a multi-agent computational architecture to process and coordinate real-time changes in vehicle locations so that improvements in terms of the operational time, shipment yard utilisation, and labour consumption could be achieved.

These researches show that RFID can be applied to different environments but the system's functionality is restricted to detection of presence within a locality. The paper by Choosri et al. (this issue) on passive RFID vehicle tracking not only solves the data streaming and location issue but also develops the technique for determining the direction of the vehicle. Research indicated that determination of the direction of RFID required continuous monitoring of RFID signals when the vehicle approached the reading station (Mo et al., 2009). Application of this concept in an industrial environment as presented by Choosri's paper shows advancement of application of this ICT capability in logistics.

RFID technology can also be used on assets. Martinez-Sala et al. (2009) investigated automation of data flows in the fresh products supply chain when developing new value-added services. A key feature of the system design is to identify a 'returnable packaging and transport unit'. Tracking of a permanent item in the supply chain allows data flows throughout the entire supply chain. Yeh et al. (2011) made use of the point-of-sale to generate actual transaction data that filled the information gap at the retail outlets. They proposed the 'intelligent service-integrated platform', which employed the software agent as the framework to construct the integrated information system

mechanism. By combining the characteristics of RFID with intelligent ICT, significant improvements can be made if an innovative solution is applied. The paper by Aggarwal and Lim (this issue) integrates the technology to the management of returnable transport equipment using RFID. The paper provides a framework for analysing the effect of RFID combined with effective modelling techniques, which can improve the opportunity for optimising the RFID system design.

Literature review on RFID applications shows that most applications are in the tracking of items outside the manufacturing environment. There are very few research reported using RFID within the factory boundary. The main difficulty is that complex event queries in the production systems should be filtered and correlated to events so that the event data can be linked to high-level manufacturing requirements that are handled by external applications. However, researches in time event management had been limited and were largely ignored by most event processing systems (Li et al., 2011). Irrespective of the difficulty, Chen and Tu (2009) proposed a multi-agent system framework and RFID technology to monitor and control dynamic production flows of the manufacturing processes. The multi-agent system could enable implementation of just in time and just in sequence manufacturing controls. This proposal was demonstrated by a prototype system installed in a bicycle manufacturing company. Likewise, the paper by Curran et al. (this issue) provides a more comprehensive case study from a specially developed system in the production line of a printing factory. This provides an insight into the initialisation of RFID information set for a particular item.

Despite the difficulty of selecting representative and forward looking submissions, this special issue presents some of the ICT applications that have significant effect on the improvement of ICT in logistics. They range from the practical system prototyping research on vehicle tracking by RFID to highly conceptual development of ICT strategy in supply chains. The guest editors are to be congratulated to have put together a balanced view in this special issue.

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