# Editorial

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*Development, International Journal of Operational Research, and Production Planning and Control.* He is also the Editor of the *International Journal of Electronic Customer Relationship Management.*

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# 1  Introduction

In the digital age, Information Technology (IT) acts as a central infrastructure in modern businesses. Without IT, enterprises may lose competitive advantages in processing and winning orders, production planning and control, marketing, decision making, resources planning and control, product or process innovation and many other strategic and operational activities. With IT, and provided it is used effectively, the users will have the potential to create a competitive advantage.

People play an important role in ensuring successful implementation and utilisation of IT in any type of enterprises, including those in public and private sectors. However, there is a gap between IT development and the people's ability to learn and adapt to new and evolved IT. Unlike larger and high-technology small firms, many Small- and Medium-Sized Enterprises (SMEs) may not have the resources and skills to adapt and use advanced IT. This scenario raises a significant dilemma – where the speed of IT development is so rapid, which makes it very difficult for non-specialists in IT, for example, managers, to be able to utilise such a development effectively let alone gaining any competitive advantages.

This special issue of *International Journal of Information Technology and Management (IJITM)* on 'Interactions between people and information technology in the digital age', aims to provide a collection of recent research in this aspect. Conceptual, empirical, experimental and case-based papers were welcomed. The objectives of this special issue are:

1    to identify innovative methods and models to address the gaps between IT development and IT take-up, and

2    to identify new quantitative and qualitative approaches for analysing the interactions between people and IT, for example, using agent-based modelling.

Following the normal *IJITM* review guidelines, we received many quality contributions to this special issue. A total of 15 papers were accepted for publication and these papers have been divided into two parts of this special issue. Part I contains seven papers. Part II contains eight papers ranging from contributions from researchers and practitioners focusing on areas related to e-commerce, development of advanced information systems, information system integration, evaluation of IT performance and new methods for use in the digital age. A mix of theory building and empirical study papers that have strong relevance to the practical world are available. We provide a brief overview of the papers, which appear in Part II of this special issue.

Pool, Parnell, Spillan, Carraher and Lester in their paper, 'Are SMEs meeting the challenge of integrating e-commerce into their businesses? A review of the development, challenges and opportunities', argues that while e-commerce technology has spread rapidly throughout large firms in the developed world, growth among SMEs has not been

as pervasive. This paper discusses the current state of e-commerce development in SMEs, outlines challenges faced by many SMEs and proposes several options for e-commerce integration. Specific opportunities in the areas of customer service and relationship management, supply chain management and e-commerce support are discussed.

The paper, 'Developing e-commerce business models for enabling silicon intellectual property transactions', by Huang and Shyu suggests that Integrated Circuit (IC) design productivity has failed to keep pace with Moore's Law in the past ten years; thus, a 'design productivity gap' between the increase in IC design complexity and productivity increase has emerged. As the IC industry migrates to the System-On-Chip (SOC) era, the nature of Silicon Intellectual Property (SIP) that can narrow the 'design productivity gap' has made SIP critical for the design and implementation of a complex SOC. There are two major categories of SIP problems, technical and business; both are based on current SIP transaction business processes. Their research aims to develop e-commerce business models to resolve complex technical and business issues inside SIP transactions and thus enable business more fully online. The benefits of the proposed e-commerce business models and efficiency improvements to SOC designs regarding the leveraging of the proposed models are discussed.

Ho, Lau, Lee, Ip and Ho in their paper, 'Design and development of an agent-based information system for process improvement', highlights that to meet changing needs of customers and survive in the increasingly globalised and competitive environment, it is necessary for companies to equip themselves with intelligent tools, thereby enabling managerial levels to better use the tactical decision levers at their disposal. However, the implementation of an intelligent system is always a challenge for SMEs. Therefore, a new and simple approach with 'process rethinking' ability is proposed to generate ongoing process improvements over time. A roadmap of the development of an agent-based information system is proposed. A case example is provided to show how the system can assist non-specialists to make right decisions for continual process improvement.

The paper, 'Decision support system for integrated planning and scheduling', by Kungwalsong and Kachitvichyanukul presents a decision support system for integrating tactical and operational decisions in a manufacturing system operated in a job shop environment. The system consists of a planning module, a scheduling module, a support database and graphical user interface. The key features are the inclusion of bills of materials and processes in the scheduling module and the option to freeze part of a previous schedule to allow for multiple pass scheduling exercises.

Wu in his paper, 'Detecting information technology impact on firm performance using DEA and decision tree', proposes a generic model developed using Data Envelopment Analysis (DEA) and decision trees to detect the impact of IT on firm performance. The model consists of two modules: Module 1 applies a two-stage DEA and classifies the IT-affected Decision-Making Units (DMUs) into efficient and inefficient clusters based on the resulting efficiency scores; Module 2 utilises firm performance related data to train decision tree model and apply the trained decision tree model to new firms. The results yield a favourable classification accuracy rate.

The paper, 'Computer integration using the Mckinsey 7S model as an underlying framework: a case study in the foundry', by Gandhi, Selladurai and Santhi suggests that computer applications are highly dependent on how effectively computer is integrated within the firms. Their research shows that industries can integrate computer in a more efficient way by using McKinsey's 7S framework as a guideline. A case study of

computer integration using McKinsey's 7S model in the foundry is presented and explorative usage of simulation software in the foundry is also analysed.

Chiao, Chi and Agarwal in their paper, 'Strategic quality competitiveness management', claims that quality products cannot be done for the short-term business profit activities, and cannot be only passively depended on the sampling result of customers' questionnaire responses. It can be done through the long-term reliable procedures for the joint committed agreement between producers and customers. The Six Sigma practices were adopted, by which the competitive conditions of the products can be formulated, planned and managed. Using these practices, it was suggested that the Bayesian sequential procedures, the well-defined review, verification and validation tasks, the level of the product competitiveness and the degree of customers' satisfaction can be measured.

The paper, 'A new stepwise project management method', by Lu develops a stepwise Project Management (PM) method to resolve PM issues. The template of a new stepwise PM method is derived from a Project Management Inc. (PMI) 19-Step PM method. The 19 steps were divided into five groups by PMI:

1   scope/requirements

2   work breakdown structure

3   predecessor networks

4   assigning people to tasks and

5   tracking results.

Viewing this from the perspective of management, there exist four basic management functions: planning, organising, leading and controlling. Having rearranged the PMI five groups into four groups of the basic management functions and further reduced the unnecessary steps, a stepwise PM method that is rearranged under the management functions is created.