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## Editorial

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**Biographical notes:** Heechang Shin is an Assistant Professor of Information Systems at Iona College in New York. He completed his PhD in Information Technology from Rutgers University. His research interests are on the topics of information privacy and security and data mining: information security and privacy issues raised by data mining techniques, efficient enforcement of privacy and security via secured indexing of access controls, use of data mining for enhancing security and privacy. His other research interests include mobile commerce and sales management.

Haibing Lu joined the Department of Operations Management and Information Systems in Fall 2011 from Rutgers University in New Jersey, where he was a Teaching Assistant as he completed his Doctoral studies. His research interests include works in the information systems security and data mining, particularly exploring privacy and security issues in data-oriented applications. He has co-authored papers appearing in the *Journal of Computer Security* and *IEEE, Transaction on Dependable and Security Computing*, and has presented his work at many international conferences. He completed his BS and MS in Mathematics from Xi'an Jiaotong University (China), and his PhD in Management of Information Technology from Rutgers University (New Jersey) in 2011.

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Many organisations are working with unmanageably large data sets, called big data, and the importance of using data analytics that can cope with this scale of data is considerable. Organisations' ability to identify patterns and to gain analytical results to achieve competitive advantages creates great opportunities for business innovation, as organisations are capable of harvesting relevant data and using it to make the best decisions to achieve business innovations.

This special issue of the *International Journal of Technology, Policy and Management* explores innovative, high-quality research results in the aspects of big data

analytics and its impact on business innovation. This special issue covers the topic in four domains - education, public sector such as non-profit organisations and governments, security management, and management strategy. Each domain finds that big data analytics can lead to business innovations. The selected papers discuss technical, managerial, and empirical solutions. The brief summaries of the selected papers are as follows.

Big data can play an important role in education where digital learning technologies collect vast amount of data on a student's learning process in addition to outcomes such as test scores and grades where traditional methodologies can only focus on (Francisco, 2015). The data can be used to develop innovative methodologies to improve students' learning. Koh and Choi perform an interesting research on a pedagogic methodology through big data analytics in their paper. Their methodology facilitates students to examine their goals and motivations, to improve learning styles, and to be an active learner according to them.

The volume of data available for the analysis within a public sector is enormous - the Australian Department of Human Services alone deals with 23.4 million active Medicare records (Howarth, 2014). Governments and public sectors are becoming more and more interested in the data analytics such as predictive analytics (Howarth, 2014). Simulation is one of the predictive analytics which helps to make decisions by testing hypothetical scenarios. Effectiveness of simulation can be significantly improved as data size increases. Thus, a simulation based on big data will improve the accuracy of prediction results. Fang and Li use a simulation model to illustrate the effect of interest rate pegs and demand shocks on the economy in their paper. Their analytical results conclude that under the interest rate peg periods, the GDP and domestic consumption actually increase on the demand shocks. Interest rate peg helps a house-hold to build up the expectation that real interest rate will fall upon demand shocks, which will stimulate the domestic consumption according to Fang and Li.

Shin and Chen examine how a non-profit organisation (NPO) uses the Internet technologies to build public relations and to increase charitable giving by analysing the contents of their websites. NPOs have been suffering with competitive pressures and cutbacks in government funding. Shin and Chen study NPOs' online strategies to promote fundraising in order to address such issues. Their study suggests that certain fundraising and communication practices, such as campaign summary, CEO's message, volunteer opportunities, information sharing (or request), annual report, and social media use, are positively associated with the level of fundraising.

Role based access control (RBAC) is a security measure that protects important resources by making sure that only authorised users can gain access to resources. Although its use is quite popular in the industry, RBAC is not efficient when a new user is added to an existing system since a security administrator must make a decision about the user's role in the system manually. Any assignment error may cause security breaches since an access may be granted to an unauthorised user. Also, this manual assignment would cost lots of system administrators' time. Badar et al. present an interesting solution to this problem. A classification method, a data mining technique, is used to determine a user's role automatically by analysing existing security policies in the system. Their experimental study shows that their approach performs quite well in both real datasets and synthetic datasets according to Badar et al.

Altschuller et al. perform an empirical study on how to employ new technologies to benefit an organisation in today's heavily IT-enabled business environments. The IT

environments have both positive and negative impacts on the audit process: (1) on the positive side, computer systems have increased auditors' ability to analyse financial activity, but (2) on the negative side, auditors have a hard time to understand the highly distributed and complicated systems, which may cause their mistakes according to Altschuller et al. According to Altschuller et al., IT innovators are those companies that bring new complex technologies into their corporate strategic goals by using its IT control programs as part of this process, resulting in more positive side of the IT environment. Altschuller et al. study whether IT innovators are associated with better performance in audits. Their empirical study suggests that IT innovators are less likely to be cited by their auditors for internal control weaknesses.

### References

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