Editorial

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Social Systems Science is at a new stage in the midst of inevitable and rapid global change. Behaviours of individuals and groups are seen as multiple interdependencies, and these interdependencies should be viewed as actions taken inside a system. Consequently, the traditional assessment methods of the social sciences, based on assumptions of independent observations, are not effective in analysing social behaviour as a social system. In recent years, system approaches which avoid such assumptions have received significant attention in addressing and resolving issues in social processes. This special issue focuses on systematic assessment methods for analysing various issues faced in social systems.

The objective of this special issue is to provide an outlet for publishing original assessment research highlighting current issues related to the wide range of social systems science. We have received an overwhelming number of submissions of research papers. All submissions were subjected to a double blind review process. Due to page limitations for this special issue, we selected only eight papers which cover a broad range of topics on assessment methods in *Social Systems Science*.

In their article 'Technology leverage and a sustainable society: a call for technology forecasting that anticipates innovation' Hazy et al. argue that, economic value to society is created when input resources are converted into valued outputs and that this occurs though the application of technology. To support this argument, they introduce the concept of technology leverage. Further, they note that the same input resource can be converted into different output values depending upon the technology employed in the conversion process and the state of technical innovation at the time the conversion occurs. Importantly, this difference has significant ramifications for current day resource allocation decisions. In addition to more conventional conservation arguments, technology leverage also recognises that the future value of retaining resources, especially non-renewable resources, may be evaluated using real option valuation techniques.

The paper 'Optimal emission-dependent production policy with stochastic demand' by Zhang, Nie and Du, develop a production optimisation model to explore the influence of emission dependence on the production-related decision-making in a 'cap and trade' system. The authors take into account multiple sources of emission permits, including emission quotas allocated by the government, permits purchased via emission trading,

and emission savings via purification, and explain how the emission-dependent manufacturer balances a trade-off between trade and purification to enable effective production. This paper is among the first works addressing emission at the operational level. Their research yields several valuable managerial insights and implications.

In the paper entitled 'Inter-institutional relationships and emergency management' Phillips suggests that a systems approach to inter-agency and inter-sector coordination can reduce the incidence and impact of 'public disasters' such as the 2007 financial meltdown and the 1989 Exxon Valdez oil spill. Phillips advocates, and begins to outline, an interdisciplinary field of research and investigation he calls 'high-performance inter-organizational interactions (HPII)'. He also emphasises the role of the revolving door as an obstacle to HPII. We note that Arianna Huffington, jointly addressing the mortgage meltdown and the Massey mine explosion (huffingtonpost.com, April 12), echoes Phillips' phrase, "The fox was guarding the henhouse."

In the paper 'Developing country efficiency assessment by means of a comprehensive model based on data envelopment analysis' by Abdelfattah, Ablanedo-Rosas and Gemoets present a data envelopment analysis (DEA) approach to evaluate the efficiency of developing countries based on the millennium development goals, an initiative by the United Nations to promote poverty reduction, education, maternal health, gender equality, and to combat child mortality and diseases. A total of 54 countries and 13 performance measures are considered in this comprehensive assessment. The selected DEA model is an output-only approach that considers country performance measures. The super-efficiency scores are computed to assign ranks to efficient countries. The authors demonstrate the applicability of DEA as an assessment method in social sciences.

In various scientific fields, such as computer science, management science, information systems and engineering, a wide range of maturity assessment models have been developed by practitioners and academics for the purpose of measuring and prescribing certain maturity parameters of technical and social systems. However, a systematisation and generalisation of the procedure for designing theoretically sound and widely accepted maturity assessment models is still lacking. Based upon the design science research paradigm, the paper 'Maturity assessment models: a design science research approach' by Mettler generalises the most important decision parameters from a developer, as well as from a user, perspective.

In their paper entitled 'Service quality improvement strategies and tools for university libraries' by Snider, Xia, and Xia study the quality issues faced by university library systems, and provide suggestions in strategic development as well as practical tools to improve the service quality of the library systems. As public academic service systems, university libraries face the task of providing high quality service to patrons under tight budget constraints. In this research, the authors assert that achieving a high level of quality while maintaining a modest level of cost is feasible. Statistical understanding, a bottom-up approach, well-built training modules, educated employees, and active management can work together to improve the service quality of university libraries for all of their patrons.

The application of DEA in mutual fund evaluations is not new in the literature. However, how to properly modify a DEA model in mutual fund evaluation is critical. In the paper entitled 'Mutual funds return and risk decomposition evaluation based on quadratic-constrained DEA models' by Zhao, Lai, and Wang propose two quadratic-constrained DEA models for the evaluation of mutual funds, from a perspective

of evaluation based on endogenous benchmarks. In comparison to previous studies, they decompose the two vital factors for mutual fund performance, i.e., risk and return, in these quadratic-constrained DEA models, one of which is a partly controllable quadratic-constrained programming, in order to construct mutual funds' endogenous benchmarks and to provide insight and management suggestions. The approach is illustrated using a sample of 64 actual mutual funds in the China market. It identifies the fundamental reasons for inefficiency and the ways to improve performance. The most important conclusion is that the ranking of mutual funds in China depends mostly on the system risk control.

In the article 'Interpreting interactions of ordinal or continuous variables in moderated regression using the zero slope comparison: tutorial, new extensions, and cancer symptom applications' Francoeur utilises the zero slope comparison (ZSC) method to interpret interactions between two ordinal or continuous variables in moderated multiple regression (MMR). Novel extensions of the method are then derived to interpret curvilinear interactions between two variables and simple interactions among three variables. The purpose of the paper is to encourage social systems researchers to consider, estimate, and interpret simple and curvilinear interactions that are based on ordinal or continuous variables. The author illustrates the original ZSC and his extensions to the procedure to interpret cancer symptom interactions, but he emphasises that the procedure is by no means limited to biological systems such as cancer symptoms within an individual.

We do hope this special issue can serve as a fine reference for researchers and practitioners on assessment methods in social systems science. Comments, criticisms and suggestions are welcomed by the editors of this special issue.

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