

Decision models for information systems management

Kweku-Muata Osei-Bryson · Ojelanki Ngwenyama

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1 Introduction

In the last two decades, information systems (IS) management decision making has become more complex. Everyday, IS managers in organizations of all over the world manage billions dollars of assets and must make complex decisions that involve information security, outsourcing, disaster recovery, software, hardware and vendor selection, investment strategies, timing the implementation of complex software systems (such as enterprise resource planning (ERP)). Inadequate understanding of these decision problems, poor decision analysis, and bad judgment can result in catastrophic outcomes for companies. However, there has been limited research on decision models and frameworks that could assist information technology (IT) managers with these complex decision problems. While there are researchers working in these areas, much of their work appears in journals outside the field of IS. The primary objective of this special issue of Information Systems Frontiers is to focus on providing solutions to significant IS management problems and to provide strategic knowledge for practicing managers. A second objective of this special issue to give impetus to the

development of a line of research that would continue to focus attention on providing solutions for the many emerging complex problems that IS managers may face.

2 Information systems decision context

Information systems management decision problems such as information security, outsourcing, disaster recovery, software, hardware and vendor selection, investment strategies, timing the implementation of complex software systems (such as ERP) are extremely complex and can adversely impact the performance of the firm. The complexity of these decision problems derive from organization and environmental conditions that include (a) multiple stakeholders with different goals and risk preferences (b) multiple objectives and value trade-offs; (c) competitive environments with risk and uncertainty; and (d) inter dependencies, indefinite time horizons and strategic impacts of decision. Under these conditions decision makers often have difficulties identifying decision alternatives and must be creative and careful in their analysis, as the consequences of poor IS decision making found in the literature show (Lytinen and Robey 1999; Yeo 2002; Ngwenyama et al. 2007). When managers face complex IS problems, decision analysis frameworks and methods can be extremely useful when they assist: (1) interrogating the problem domain; (2) structuring decision problems and generating alternatives; (3) analyzing alternatives and assessing their impacts; (4) determining the preferences of decision makers; (5) evaluating and comparing decision alternatives, and, analysis of implications. However, while general theories and frameworks exists for decision analysis, the complexity and diversity of IS problems necessitate research and development of frame-

K.-M. Osei-Bryson (✉)
The Information Systems Research Institute,
Virginia Commonwealth University,
Richmond, VA 23284, USA
e-mail: KMOsei@vcu.edu

O. Ngwenyama
Institute for Research on Technology Management,
Ryerson University,
Toronto, ON, Canada
e-mail: Ojelanki@Ryerson.ca

works and models specific to the class of decision problems that IS managers face.

3 The papers

In this special issue we present eight papers that present a range of approaches and address a wide range of IS decision problems. In general the papers can be classified into two categories, frameworks for decision analysis and decision models. One of the papers presents a conceptual framework; five of the papers present structured decision analysis frameworks, and three present decision-theoretic based models. While all the papers follow the design science paradigm of research, the decision framework papers present empirical cases, and the decision-theoretic papers present demonstrations of analysis using the models.

The Samoilenko paper (*Information Systems Fitness and Risk in IS Development: Insights and Implications from Chaos and Complex Systems Theories*) outlines a framework and principles for analyzing IS fitness and risk based on chaos and complexity theory. Samoilenko approach is more in the tradition of appreciative decision making, where the focus is on ways of thinking to help the decision maker appreciate the problem situation. Aydin and Bakker (*Analyzing IT Maintenance Outsourcing Decision from a Knowledge Management Perspective*) also follow this tradition but from an empirically grounded perspective outlining a framework for decision analysis of knowledge management issues in IS outsourcing. They focus mainly on strategies for interrogating the problem domain and structuring the decision problem. Alaranta and Henningsson (*An Approach to Analyzing and Planning Post-Merger IS Integration: Insights from Two Field Studies*) outline a framework and approach for post-merger information systems integration planning. Post-merger IS integration is a complex multidimensional problem that is challenging many IS managers. Alaranta and Henningsson discuss the key decisions of the planning process and suggest strategies for approaching them. An important feature of their approach is its grounding in empirical case studies of favorable and unfavorable strategies. The Scheepers and Scheepers (*A Process-focused Decision Framework for Analyzing the Business Value Potential of IT Investments*) framework focuses on analyzing IT investments from the perspective of business value creation. These authors develop a model for exploring the business value potential of IT at the business process level; a challenging undertaking necessary for cost-benefit analysis. The last of this category is that of Barclay (*Towards An Integrated Measurement of IS Project Performance: The Project Performance Scorecard*), who presents a framework and approach for evaluating project performance based on existing theoretical models of IS

success and the Balanced Scorecard. She focuses on defining dimensions of project measurement that are of interest to different stakeholders and a process for eliciting preferences.

The three decision-theoretic papers also vary in topics that they cover. Like Barclay, Plaza (*Team Performance and Information System Implementation Application of the Progress Curve to the Earned Value Method in an Information System Project*) is concerned with IS project performance but comes to the issue from a different perspective. Plaza is interested in predicting implementation times (and cost) for large scale IS projects and proposes a decision model based on the earned value method and the learning curve. Rao and Osei-Bryson (*An Approach for Incorporating Quality-Based Cost-Benefit Analysis in Data Warehouse Design*) focus on an aspect of data warehouse design where the major concern is the determination of the data that are to be produced and stored in the data warehouse. They present a cost-benefit model that incorporates quality issues in data warehouse design. Finally Turetken (*Is Your Back-Up IT Infrastructure in a Safe Location?*) presents a multi-criteria decision model for location of the IT infrastructure for business continuity planning.

4 Contribution of this issue

This issue of ISF makes a contribution to theory and practice of IS management from the following perspectives: (1) The papers present frameworks and models that have immediate application to various classes of IS decision problems. (2) The papers present possibilities for further research into decision models for the problems that the authors have addressed. However, this research can evolve along different lines: (a) the development of decision support systems for the addressed problems; (b) other approaches or techniques that might be applicable for extending the breadth and depth of the current approaches; (c) alternative approaches can be proposed for the set of problems and comparative analysis can be conducted.

We wish to express our appreciation to all the authors who submitted papers. We also wish to express our gratitude to all the reviewers who diligently reviewed the papers in order to ensure that there was appropriate quality and fit.

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Kweku-Muata Osei-Bryson is Professor of Information Systems at Virginia Commonwealth University. He has also worked as an Information Systems practitioner in industry and government. He holds a Ph.D. in Applied Mathematics (Management Science & Information Systems) from the University of Maryland at College Park. His research areas include: Data Mining, Database Systems, Knowledge Management, IS Security, e-Commerce, Decision Support Systems, IT & Productivity, IS Outsourcing. He has published papers in various journals including: *Journal of Database Management*, *Information Systems Frontiers*, *European Journal of Information Systems*, *Information & Management*, *Information Systems Journal*, *Journal of the Association for Information Systems*, *Expert Systems with Applications*. He serves as an Associate Editor of the *INFORMS Journal on Computing*, on the Editorial Board of the *Computers &*

Operations Research journal and the International Advisory Board of the *Journal of the Operational Research Society*.

Ojelanki Ngwenyama, MS, (Roosevelt), MBA (Syracuse), Ph.D. (Computer Science, SUNYBinghamton), is Professor of Information Technology Management and Director of the Institute for Research on Technology Management and Organizational Learning at Ryerson University, Canada. Prior to joining Ryerson in 2004, Ojelanki was Professor of Information Systems at Virginia Commonwealth University. He is currently Visiting Research Professor at Aalborg University in Denmark, and University of Jyväskylä in Finland. Ojelanki's current research focuses on ICT and productivity, IT management, software process improvement, non-traditional research methods in information systems and ICT and development. He was an Associate Editor for *MISQ* (2004-2001) and is a member of the Editorial Advisory Board of the *Scandinavian Journal of Information System*. He has also served on the editorial boards of the *Journal of Information Technology and People* and *Journal of the Association of Information Systems* and ICIS.