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Editors

Decision Support

An Examination of the DSS Discipline

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Preface

The origin of this volume came while planning the 2009 International Conference on Decision Support Systems. The theme of that 2-day conference was "Assessing Today and Envisioning Tomorrow." We wanted to summarize where the field had been and generate ideas regarding where it was going. The meeting brought together representatives from both academia and industry, and covered topics ranging from the earliest group decision support systems to new methods of managing emergency medical respons e to the future of telepresence.

The notion of looking both backward and forward to put the field of Decision Support Systems into perspective also seemed a great subject for a volume of the Annals of Information Systems series. This volume reflects some of the best papers from that event.

The first paper, "GDSS: Past, Present, and Future," is a summary of a panel discussion led by Paul Gray (Claremont Graduate University), and joined by Bob Johansen (the Institute for the Future), Jay Nunamaker (University of Arizona), Jeff Rodnman (Polycom, Inc.), and Gerald R. Wagner (University of Nebraska). The paper starts with Gray's interesting history of group decision-making systems, starting with Churchill's War Room during World War II and ending with the University of Arizona's GDSS facilities. The next section includes a discussion by Johansen regarding how GDSS systems can facilitate leadership by supporting foresight, insight, and action. Nunamaker's section addresses the escalating need for support of global teams, citing continued outsourcing, an increasingly competitive environment, and pressure to reduce costs related to travel. He also discusses the challenges of working in global teams and provides recommendations for how to make them more effective. In the fourth section, Wagner takes an entrepreneurial perspective, discussing the development and commercialization of several DSS and GDSS systems in which he was involved, including the Interactive Financial Planning System (IFPS), Vision Quest, WebIQ, and the follow-on to IFPS called Planners Lab. Finally, Rodman gives an overview and history of telepresence, and presents his vision for the future in this space.

The second paper is titled "Reflections on the Past and Future of Decision Support Systems: Perspective of Eleven Pioneers." This paper reports the reflections of a number of people who have been active in the DSS field since its

inception, including a timeline and a description of major events. Dan J. Power (University of Northern Iowa), Frada Burstein (Monash University), and Ramesh Sharda (Oklahoma State University), all well-established and respected researchers in the DSS field in their own rights, document the commentary provided in these interviews. Interestingly, these pioneers of the field were generally more interested in talking about the future than they were about reminiscing about the past.

Sean Eom's (Southeast Missouri State University) paper, titled "The Intellectual Structure of Decision Support Systems Research (1991–2004)," uses author co-citation analysis to determine the major areas of study in the field. The paper is interesting for both its methodology and its findings. Eom constructed his data set from most frequently cited 1% of papers, and his analysis revealed six major areas: group support systems, model management, foundations, DSS evaluation, user interfaces, and multiple criteria DSS and negotiation support systems.

The fourth paper focuses on a topic that has received increasing emphasis in the last few years. In "Ethical Decision Making and Implications for Decision Support" John R. Drake (Eastern Michigan University), Dianne J. Hall (Auburn University), and Teresa Lang (Columbus State University) examine decision making processes in ethical contexts. They adapt Jones' issue contingent model of ethical decision making and fold in theories by Rest and Kohlberg to develop DSS design implications. Their approach provides a blueprint to build systems that could be the basis for measurable progress in the area of decision support in situations involving ethical concerns.

The fifth paper illustrates the global nature of our field. James Pick (University of Redlands) investigates web and mobile spatial decision support in "Web and Mobile Decision Support as Innovations: Comparison of United States and Hong Kong, China." Fourteen business and government organizations are studied in this paper, with most of them being assessed as having achieved a middle stage of adoption/diffusion of this technology. None of the organizations were found to be in an advanced stage. The research provides an interesting, multinational look at a rapidly emerging technology that is not always accepted without resistance.

Chapter 6, titled "Knowledge Management Capability in Education," was written by Jeremy Hodges (Embry-Riddle Aeronautical University) and Ronald Freeze (Emporia State University). Hodges and Freeze present a case study where a Knowledge Management Capability Assessment (KMCA) instrument was validated within a Department of Defense educational organization. This extends their previous work, where the instrument was developed and testing in the manufacturing industry. The application to this new setting yields several interesting insights, including that basic knowledge capabilities are consistent across industries.

Our seventh paper is written by a trio of researchers from Ben-Gurion University. Meira Levy (also from Deutsch Telekom Laboratories), Nava Pliskin, and Gilad Ravid collaborated to write "Knowledge Warehouse for Decision Support in Critical Business Processes: Conceptual Modeling and Requirements Elicitation." This paper is particularly timely, since it considers the dynamic and often unpredictable characteristics of today's business environment. The authors combine a knowledge warehouse conceptual model with information that decision makers in critical

business processes own. Their goal is to enable rational decision transparency. Their design science approach opens the door to new research in DSS in an important way.

The eighth paper in this volume, titled "Agent-based Modeling and Simulation as a Tool for Decision Support for Managing Patient Falls in a Dynamic Hospital Setting," describes the use of agent-based modeling to address a contemporary issue in patient care. Gokul Bhandari, Ziad Kobti, Anne W. Snowdon, Ashish Nakhwal, Shamual Rahaman, and Carol A. Kolga (University of Windsor) created a simulation for patient falls in a Leamington District Memorial Hospital in Ontario, Canada. They found the optimal nurse shift configuration for reaching patients in the least amount of time. This is a particularly timely topic, as information technology is being seen as a necessity in addressing rising healthcare costs.

In Chapter 9, titled "Context-aware Mobile Medical Emergency Management Decision Support System for Safe Transportation," Frada Burstein (Monash University), Pari Delir Haghighi (Monash University), and Arkady Zaslavsky (Lulea University of Technology) take a different approach to the application of decision support to the heathcare industry. They address a specific, practical problem: emergency medical response for large events. They present a design for new system to manage incident response that uses data from hospitals and information about road and traffic conditions to determine the best route for each patient case. With today's pervasiveness of mobile computing technology, one can see how this system could be deployed in a variety of environments.

One of the goals of our conference was to include teaching aspects of DSS as well as research-oriented topics. In the tenth paper, "General Motors Bailout Problem: A Teaching Case Using the Planners Lab^{TM} Software," two of the "pioneers" of DSS interviewed in Chapter 2 work with two younger researchers to demonstrate how to teach DSS concepts using state-of-the-art decision support software. Jim Courtney (Louisiana Tech University), Krisitin Brewer (Louisiana Tech University), Randy Kuhn (University of Louisville), and Gerald R. Wagner (Bellevue University) combine to illustrate how a model of a complicated business situation can be built using software that supports "rehearsing the future." This case study can be easily adapted for a class covering DSS concepts. The software is also publically available.

This volume concludes with "Assessing Today: Determining the Decision Value of Decision Support Systems" by Gloria Phillips-Wren (Loyola University Maryland), Manuel Mora (University of Aguascalientes), and Guisseppi Forgionne (University of Maryland Baltimore County). These researchers are well-known for taking a systems approach to analyses. They continue that tradition by extending previous studies and linking the type of support provided to the decision maker with the specific DSS design characteristics needed to deliver those services. They implement their framework using an analytic hierarchy process and demonstrate the ability of their design to support further DSS research.

These papers represent a snapshot of the Decision Support Systems field. It can be informative and enlightening to occasionally pause and consider how a field is evolving and in what direction it is headed. One thing that is striking about the papers in this volume is how they reflect many of the contemporary forces shaping our world: mobile technology and ubiquitous computing, globalization, health care,

ethics, and the recent financial crisis. We find today that DSS has become so ubiquitous that it often appears under a different name or embedded in some other focus area. Many of the subjects of the articles in this volume, such as data warehousing, business intelligence, knowledge management, and agent-based modeling, continue to develop approaches and ideas that have their foundations in earlier DSS studies. Without doubt, support for decision processes will continue to be important, if not critical, as decision making environments become more complex, dynamic, and ambiguous. We hope you find these papers informative and inspiring, and we look forward to seeing what emerges in the decision support arena over the next couple of decades.

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