

An Introduction to the DSS Minitrack on Modeling and Decision Technologies

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Modeling and Decision Technologies provides a forum for discussing the development, implementation, application, and delivery of modeling techniques drawn from disciplines such as artificial intelligence, conceptual modeling, information engineering, management science, and operations research. We believe that the study of the various modeling processes and paradigms employed in these disciplines may eventually lead towards a unified modeling theory and the principled use of models in information systems.

This minitrack is an eclectic one which encompasses any topics which relate to model management and the practice thereof. This may include the theory, application and use of decision technologies in information systems and/or the use of models to create and evaluate information systems as well as models embedded in information systems to aid business processes.

This year's contributions manifest the breadth of topics which often characterize this Minitrack.

Hua and Kimbrough's "TEFA-2: Model Management with Structured Modeling and Embedded Languages" is really a miniature case study which chronicles the inertia still surrounding the practice of model management in contemporary organizations. The reluctance of management to embrace models and the insight they can give to decision making is a time-honored, if not laudatory, tradition. This paper presents another example in the ongoing "malaise of management science", enumerating the common excuses which are proffered in defense of ignoring model management and discussing a specific situation where lack of model management had grievous consequences. A tool for facilitating model management, TEFA-2, is described as one possible alternative.

"Model Management in Electronic Markets for Decision Technologies: A Software Agent Approach" by Bhargava, Krishnan, Roehrig, Casey, Kaplan, and

Müller, captures perfectly the essence of this Minitrack's theme. The paper is another in the impressive series of works which Bhargava and Krishnan have generated concerning electronic markets for decision models. They describe the use of the World Wide Web as a delivery vehicle for decision models and how software agents facilitate the operation of this electronic marketplace. This innovative research may very well provide another effective antidote to the "malaise of management science" which Hua and Kimbrough describe.

"Candle-Lighting Analysis, Genetic Algorithms, and CLAP-NT (version 1.0.0): Tools for Supporting What-if Analyses" by Branley, Fradin, Kimbrough, and Shafer describes some new techniques for post-evaluation of decision and policy models. A robust capability for sensitivity analysis is a necessary feature for understanding and making sense of any model. What the authors are proposing with their genetic algorithm approach could appropriately be called "model mining", a counterpart to data mining which allows analysts to explore more fully the implications and insights inherent in their respective optimization models.

There are two papers which deal with the topic of database design but which come from rather different perspectives. The first is "A Meta ERM and its Relational Translation for a Database Design System" by Choobineh which describes a meta-model for the extended entity-relationship data model. The advantage of a meta-model is it provides the foundation for a data repository which can maintain system data and automatically enforce integrity constraints. Such repositories augment significantly the rather paltry dictionary features which most relational DBMS provide. The second paper, "Defeasible Dependencies for Relational Database Design" by Potter, adopts a logic modeling approach to database design. The approach

here is to extend the notion of functional dependency graphs to include uncertainty in the dependencies, for example to represent dependencies which are usually true but have occasional exceptions. The argument presented is that defeasible reasoning captures more meaning than other uncertainty approaches, and thus enhances the kinds and amount of information which can be brought to bear upon database design.

“Earning Benefits of the Object-Oriented Paradigm in Dynamic System Simulation” by Hitz and Werthner discusses the application of object technology to dynamic system simulation models. The narrative is much in the spirit of the ground breaking work done by Bernard Zeigler and his students. The authors show how to cast this class of models into the object paradigm and then discuss the advantages of doing so, emphasizing particularly model reuse and model integration. Since object technology is a favorite implementation medium for model management researchers, this work provides a doorway to incorporating simulation models in proposed modeling environments.