

: What are the achievements, trends and challenges for Decision Support Systems?

In late October 2001, Manuel Mora, an Associate Professor in the Department of Information Systems, Universidad Autonoma de Aguascalientes (www.uaa.mx), Mexico, asked me to answer a brief e-interview (5 questions) about the achievements, trends and challenges of Decision-making Support Systems (DMSS), including DSS, EIS and Expert Systems. In my responses I tried to look broadly at the various types of DSS, including Data-driven, Communications-driven, Knowledge-driven, Document-driven and Model-driven DSS. The following are my "off-the-cuff" responses to his questions.

1) What are the key achievements from the research and practice of DSS in the last 20 years (1981-2001)?

The key achievements seem to be associated primarily with innovative products like Expert Choice, GroupSystems, IFPS and PowerPlay. In some ways the key achievements have come more from applied research and practice than from traditional academic research. A number of Professors have migrated to the commercial realm to pursue their ideas. For example, researchers at a number of Universities made substantial contributions to the development of Group DSS and their research stimulated many studies related to the use of group technologies in organizations.

Vendors have worked to implement DSS products using graphical user interfaces and this has increased the accessibility of query and reporting tools, decision models and expert system technologies. Improved products have not however led to many new empirical studies related to how DSS impact decision behavior or decision quality.

2) What are the research issues and practical problems that have yet to be resolved in the field?

The research issues related to Decision Support still reads like a long shopping list. A few questions stand out for me including: How can changes in the user interface impact the utility, perceived usefulness and effectiveness of a specific category of decision support system? How does the metadata available to a user impact the usefulness of a data-driven DSS? How does interactive video and voice change the dynamics and results of a synchronous meeting where some participants are geographically dispersed?

As far as practical problems, they are perhaps fewer in number than 20 years ago, but more important because of the increased number of DSS users and their evolved expectations. Managing and creating large decision support databases remains a difficult task. Model management and model reuse remain difficult tasks related to building Model-driven DSS. Representing knowledge and capturing knowledge from experts in useful domains for decision support is certainly not a trivial task.

Despite extensive commentaries, anecdotes and studies, building Knowledge-driven DSS seems more like a myterious art than a routinized, well-understood development methodology. Finally, communications technologies have improved tremendously, but much needs to be done to insure that systems are available when needed, perform satisfactorily and that needed capabilities for interactive video are provided and integrated with other decision support and collaboration tools.

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3) What are the 3-5 characteristics for the next generation of DSS for all management levels?

There won't be a single next generation for decision support. Some characteristics that will appear in decision support systems include greater customization, more integration with other information systems, integration of interactive voice and video, voice driven user interfaces, and more powerful representations including 3-D graphics and more realistic, graphical business and process simulations. I'm looking forward to "Roller Coaster Tycoon" or "Roller Coaster Designer" like decision support simulations.

4) What are the core concepts that are essential for future DSS architectures?

From my perspective the core concept is accessibility, but security issues need to be addressed more systematically than they have been in recent years. Also the issue of database design and backup is a problem in terabyte sized warehouses that will only get worse. The issues associated with distributed components (.NET) and the role of application service providers (ASPs) will further complicate the design of DSS.

5) What are the main trends and challenges in the development of DSS from a practical perspective?

The main trend seems to be vendor consolidation and the main challenge remains innovation. The "older" Business Intelligence and Modeling and Analysis vendors seem to be ready for a wave of mergers and other joint activities. Innovation is still possible in this product space and the example of Web Decision portals suggests that more innovation is both possible and likely. There is certainly a need for new products in most of the decision support categories.

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