

: What is advanced or next generation Decision Support?

The "bleeding edge" of technology development and DSS is often a costly swamp. Yet it can be very profitable to gain a "first mover" advantage in applying innovative technology developments for decision support. So the various answers to this question should be of interest to vendors, large organizations that seek a long-term competitive advantage and academic researchers who are interested in studying emergent decision support technologies.

This simple question asks what is possible and what is probable in the development of the decision support systems of the near future. In a previous Ask Dan! (03/16/2003) I discussed Moore's Law and suggested that improvements in microprocessor technologies enabled the design and development of more sophisticated DSS. Other enabling technologies that have and will impact what is possible include storage and display technologies; networking and communication technologies are also very important. The leading edge of enabling technologies seems to foreshadow what will become more widespread decision support capabilities by about 5 to 8 years.

Organizations have developed many computerized systems to support various decision making and planning processes and tasks. Some of the systems have focused on management and operations control, others have focused on financial management, logistics and planning. In general DSS have been built to assist in complex decision tasks that involve expertise and large amounts of information or that can otherwise benefit from using prescriptive decision models.

The next step in building more sophisticated DSS exploits some new technologies, but more importantly we will need to refocus on creating a synergy between users and a specific DSS that is helping a person perform a decision task. We have not yet built HAL of 2001: A Space Odyssey and that type of decision support is not possible in the near future. The Fifth Generation Project was not a success (cf., Feigenbaum and McCorduck, 1983). So where is the current leading edge and what technologies are on the horizon that can be exploited to build more advanced DSS? Grid computing and parallelism in next generation Intel chips seem particularly interesting from a DSS perspective. Speech generation and recognition developments can be exploited in ways other than a "human-like" HAL; stereographic displays and wearable computing are maturing technologies. Global positioning technology is getting smaller and radio frequency and wireless devices are becoming more powerful. The realm of XBox/Nintendo games and multiagent development tools is pointing toward more detailed "realistic" simulations. The NSF Next Generation Software Program is funding leading edge research on dynamic data-driven decision support. Finally, the Real World Computing Project funded by Europe-Japan is winding down and we will see any fruits of that investment (see Joseph, 2001).

How will DSS designers, innovators and developers take advantage of grid computing, parallelism, new displays, etc. My colleagues Peter Keen (peterkeen.com) and Jerry Wagner have written a manifesto about the need for advanced decision support and what it means. In general, I am in agreement with their analysis, and I am working with them in the International Academy for Advanced Decision Support (<http://www.iaads.unomaha.edu/>). Jerry is the Director of IAADS. Let me quote from their manifesto:

"What has been missing is the exploitation of visual simulation models, animation, multimedia, business war gaming, and many other tools for helping managers envision the future, share insights, and get a sense of the dynamics of business systems. In other words, if you can't see it, you can't get it."

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"Mobile computing has been limited to laptops. All this has greatly constrained decision support payoff where it often counts most: reaching and executing a decision in real time across distributed locations and actors.

"No computer application can, in itself, make people creative. Yet, by providing tools that are easy to use, fast to apply, visually communicative, flexible, adaptive, and mobile, decision support can liberate people from many constraints. These constraints consist of access to information, complexity and cost of analysis, difficulty in communication, and leveraging their time and energy more effectively."

Based upon the above analysis, what is advanced or next generation decision support? The following four statements capture what seems possible in the near future. Advanced decision support is:

1. A customizable, high resolution, graphics-intensive user interface;
2. Dynamic, "real-time", data-driven analysis capabilities;
3. More powerful and easier to construct visual simulation models that decision makers can interact with to "envision" the future; and
4. Wearable, wireless devices with distributed analysis and collaborative capabilities that can support individuals and teams.

The transformation in decision support associated with Internet technologies is ongoing. The potential expansion of decision support to mobile devices is only beginning; grid computing and improved communications will create new decision support opportunities. We can expect much better, more targeted, more secure decision support systems in the years ahead. I am sure the IAADS group will be discussing these issues at the upcoming "Decision Support Thought Leaders Summit" October 16-17, 2003 in Omaha, Nebraska.

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