

Editorial plan for decision support systems

Peter G.W. KEEN

Sloan School of Management, M.I.T., Cambridge, MA, U.S.A.



Peter G.W. Keen, Associate Professor of Management Science, Sloan School of Management, MIT, teaches and conducts research in the areas of decision support systems and implementation. In addition, he is addressing the software bottleneck problem by attempting to recognize and measure dimensions of effectiveness of people such as systems analysts, programmers, and project managers. Before rejoining the faculty of the

Sloan School, he held faculty positions at Stanford and Wharton. His industrial experience includes management and technical positions in Esso Petroleum and a computer service bureau. He has consulted widely and is co-author of *Decision Support Systems: An Organizational Perspective* (with Michael S. Scott Morton).

The term 'Decision Support Systems' seems likely to be one of the vogue words of the next few years within the Management Informations Systems field. Like most rallying cries, it is rather vague. At one extreme of practicality and simplicity it means interactive computer systems for hands-on use by managers. From that perspective, the issues for research — and hence publication — are ones of design, software development, case illustrations and methodologies for evaluation of DSS. We can expect practitioners to move far ahead of academics and it may be their experience and creativity that will make Decision Support Systems a meaningful concept and not just another fad within field notorious for its readiness to make huge claims for ill-thought out techniques.

This practical work will be important and should, if done well, quickly build up a critical mass. The audience for *Human Systems Management* will be influenced by it and contribute to it. Obviously, though, this journal is in no way intended as an outlet for it. *Human Systems Management* must complement and extend the practical work; it is in fact the only journal that can give those interested in Decision Support — the end for which a DSS is the means — a forum for exploring the conceptual issues that are implicit in the rallying cry but as yet not formalized.

Decision Support is one of the few attempts to fuse MIS and OR/MS. It challenges the rationalist themes that dominate the applied computer field. It emphasizes descriptive studies of decision processes and its theoretical base will be as much cognitive psychology as computer science. It accepts the primacy of judgement and assumes that 'interesting' problems, ones that merit a technology for Decision Support, invariably involve ambiguity, multidimensionality and dilemmas of choice. Up to now, these issues have been explored at a superficial and fairly simplistic level. The impetus for Decision Support Systems has come from individuals and institutions concerned with building real decision aids for real situations. The limited conceptual work has been biased towards MIS (rather than OR/MS) and towards

application needs (rather than application potentials).

The implicit concerns for Decision Support listed above are the explicit and central topics of *Human Systems Management*. At the other extreme of definition from the practical one of DSS as interactive systems for managers is a concept of systems for coping with complexity, that will complement and mesh with elusive decision processes, support intuition, include values as well as logic, and help individuals deal with fuzziness, ambiguity, lack of structure and, above all, multiplicity and multidimensionality. From this perspective Decision Support Systems are the vehicle that translates many of the concepts developed in *Human Systems Management* into a tool for problem-solving. In turn, *Human Systems Management* is the forum for enriching the conceptual base and, by extension, potential range of techniques and methodologies for developing those tools.

The Editorial Plan for selecting and commissioning papers on Decision Support Systems for *Human Systems Management* stresses the joint aims of *translation* of concepts into techniques and *enrichment* of techniques through new concepts. Given that the techniques are reasonably well-established (although there are few Decision Support Systems as yet that exploit methodologies for building models for multi-criteria decision making) the emphasis will be on enrichment. The central question is *how can we build tools that improve decision making in areas where existing techniques or unaided judgement are clearly only partially effective?* The challenge is not to automate decision processes or improve their efficiency but in essence to make computer-based methodologies applicable to the most complex problems without distorting them by trying to impose a false structure or reduce multidimensionality to some unitary criterion. If we can define a conceptual base for handling the full complexity of human problem-solving, the techniques will follow, however slowly. The real limits on a science of Decision Support are the richness of our understanding of decision making, not of computer systems.

The following is a list of obvious questions we cannot yet fully answer, but which are even now implicit in existing work on Decision Support Systems. They need answers. *Human Systems Management* will be the outlet for such answers:

(1) After thirty years of research in economics, psychology, management science, organizational behavior, and other disciplines, what have we really learnt about human decision processes and what do

the results imply for the design criteria of DSS?

(2) How can we build DSS to deal with values and qualitative issues? Do any of the theoretical models in particular disciplines provide a clear base for doing so?

(3) How should we study decision processes in order to build DSS?

(4) What *is* effective decision making in unstructured situations? What does it mean to 'improve' decision processes?

(5) What is the potential role of computer systems within complex decision making? Where should we begin to apply DSS to situations involving intuitive and qualitative problem-solving? What is a meaningful strategy for Decision Support in such contexts?

(6) What do we need to know in order to develop a science of Decision Support? How much of that knowledge is available? How do we start looking for the rest?

Of course, such questions are open-ended and imprecise. It is easiest to answer parts of them, to avoid facing up to the need for a coherent, comprehensive paradigm for Decision Support and instead to tackle the implementation 'problem', the design of multi-attribute models, the methodology for representing cognitive maps, etc, etc. These are indeed legitimate tactics, but they do not address the strategic and long-term issues. *Human Systems Management* is probably the only journal read by and written by workers in the DSS field that will discuss those issues. Vague and vogueish fantasies of human-machine symbiosis are not what we need here, but there is plenty of room for brave leaps of imagination; flights of fancy will be brought back to earth by the practicalities of Decision Support: *how* do we develop tools — *what* tools?

Our invitation to those concerned with Decision Support Systems is to sharpen the vision implicit in the definition of DSS as a practical tool to support rather than replace managerial judgement in ill-structured tasks. The questions listed above are a starting point. Whether an author chooses to address them or any others, *Human Systems Management* actively solicits responses that meet the 'high standards' defined in its statement of editorial procedures:

Intellectual quality, contribution, and validity of aims: for Decision Support Systems, this requires a clear concept of what we mean by Decision Support and a genuine multidisciplinary synthesis of fields and themes from disciplines that have focussed on decision processes.

Significance of issues and potential for action: these will be hard to balance for DSS – if a paper deals only with immediate and practicable action, it will be unlikely to address significant concerns. We already know how to build practical systems for certain classes of user and problem. We want to *extend* the range of potential action; not coincidentally, this implies dealing with decision situations that we only partially understand and for which standard technologies are inadequate.

Transdisciplinary scope: Decision Support is inevitably multidisciplinary. The challenge is to avoid fragmented and piecemeal borrowing from, say, psychology and the economics of information, and instead to define a paradigm that can, however gradually, point towards a theory and a science.

Substantiveness of contribution: substantiveness in the context of Decision Support means adding to our *general* capabilities. It is very unlikely that we can learn much about Decision Support from a description of a specific Decision Support System, unless the

author can relate that experience to the broader concerns. Every successful innovative DSS raises the question ‘So what?’ - if the system is the end in itself, it is not a substantive contribution to Decision Support. This may seem overdogmatic, but obviously *Human System Management* is not a forum for revealing technical virtuosity. The most likely impediment to progress in Decision Support is too much concern with Decision Support Systems for their own sake.

Boldness of thought: while we must avoid utopian fantasy and cheap predictions, we must get beyond software design and specific applications. The *end* is Decision Support and the *means* whatever technology is at hand.

Innovativeness: almost by definition, any ‘significant’ contribution to Decision Support will be innovative and an innovative contribution that meets the other measures of standard will be significant.

Our aims for both Decision Support and *Human Systems Management* are ambitious. The themes of both merit ambition.