Viewpoints

REPLY TO COMMENT BY C. B. CHAPMAN

THE POINTS made by C. B. Chapman seem to me to be mostly valid. The difference between us need be no more than one of emphasis. Certainly the costs of coming to a decision can be important, particularly if the decision is one of a whole sequence dealt with by an ongoing decision system. Whether it is at all easy to include the decision costs in a formal manner is another matter. Dr. Chapman may agree with my conclusions from the following example whereas Professor Eilon may not.

At some point in his deliberations a decision-maker finds he is seeking an optimal value (or perhaps a set of optima under various conditions). His aide, the operational research worker, points out that the cost of finding the optimum is high. The decision-maker takes this new piece of information into consideration and as part of his own decision says "All right. I will be satisfied with something within 5 per cent of optimum." The OR man may then be able to develop a less costly technique. For example, if branch-and-bound is to be used, he may modify it to accept an improvement over a current solution only if it is better by the necessary margin. Whether we now say that the decision-maker is an optimizer or satisficer is, I suggest, a ticklish point which we should not worry too much about.

Chapman's last comment that we must be clear about what we mean for otherwise we are simply playing with words is perhaps a little harsh. Maybe it is by playing with words (or symbols) in this way that we come to a mutual understanding.

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ROBUSTNESS AND OPTIMALITY AS CRITERIA FOR DECISIONS

ROSENHEAD *et al.*[1] propose the use of "robustness" as a supplementary criterion for the choice of an initial decision which forms part of a sequence of decisions to be taken some time in the future, but which are not initially predetermined. An appropriate framework appears to be as follows, in accordance with the usual formats for decision-making under uncertainty (inclusive of risk and certainty). The presentation has been slightly changed to allow a more general statement of the position but, it is hoped, without misrepresenting the authors' intentions.

The realizable future environments form a set E with a general member e. The possible sequences of decisions form a set S with a general member s. Associated with each e, s, we have a measure of performance $m(s, e)$. Associated with each sequence s, there is an initial decision, say $d(s)$. Associated with

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