

3 1 J U L Y

WHAT KIND OF SCIENCE SHOULD INFORMATION SCIENCE BE?Silvio Ceccato

Assuming information becomes communication when the two parts perform the same operations, that is when they develop the same thought, a science concerned with information is to be directed, first of all, towards the individualization, analysis and description of these operations, in addition to the studies on the physical aspects of the messages being transmitted.

A second step may consist of examining how the operations of the two parts are made public, that is, of examining the ways of communication, in particular preparing an operational grammar.

During a third stage our attention will be focussed on whatever can facilitate or hinder the repetition of the operation of the person who informs by the person being informed. The main topics of this research are: attitudes and values which may be shared or not between the two parts; and the matching up of thought with sensations, emotions, etc.

Decision theory and logico-linguistics:
possible foundations for a 'shallow'
and a 'deep' science of information

W. S. Cooper

Like a swimming pool, information science has a shallow and a deep end. The shallow end deals with the grosser statistics of information usage, and attempts to supply rational solutions to the problem of how to design literature search systems of maximal utility. The deep end deals as well with the fine structure of particular coding systems, ie languages; and this deeper penetration is what is needed in the design of

question-answering systems, fact retrieval systems, and other advanced types of information systems which must 'understand' to some extent the information they manipulate. In the received taxonomy, the shallow and deep ends of information science correspond (more or less) to theoretical bases for designing 'reference retrieval' and 'data retrieval' systems respectively.

If the swimming-pool characterization of information science is accepted, a case can be made that the 'shallow' part of the science is largely an application and elaboration of decision theory. To maximize the collective utility to its users of a literature search system, one must first define 'utility'; one must next find ways of predicting the probabilities of certain future events; and finally one must somehow put the utility and probability predictions together and come up with design decisions. Classical decision theory stands available as the currently received logic for how to do these kinds of things. The 'deep' regions of information science involve utility and probability considerations too, but now these emerge as just two of the elements of a far more extensive theory which is partly linguistic, partly logical, in character. Logical considerations are becoming more prominent in the work of some descriptive linguists, and it is reasonable to expect that the study of logical inferences among linguistic expressions will eventually be seen as central to 'deep' information science. It has been demonstrated many times over that systems of deductive and inductive inference are indispensable to the design of most advanced information systems, and if the inferences are to take place in rich languages, the essentially logico-linguistic nature of the underlying theory becomes clear.

M. Kochen

'What kind of science is information science?' My brief answer to that question is that it is meta-science, or the science of science. It should not be forced into the existing typology of science, though it draws heavily on both the