

Soft intelligence for hard decisions

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An approach to decision making based on soft metrics could allow problems to be solved where no definitive "yes-no" answer is possible in fields as diverse as healthcare, defense, economics, engineering, public utilities and science. Writing in the *International Journal of Intelligent Defence Support Systems* Mihaela Quirk of Los Alamos National Laboratory explains how.

Progress in science and technology demands logical correctness, but problems with a definitive "yes" or "no" answer are rare. Decision makers are often faced with vast quantities of information, whether epidemiological statistics on the incidence of disease, data on failure tolerances in a fleet of passenger aircraft, or conflict decisions in the defense arena.

How can the need for logical rigor be reconciled in the face of such fuzzy information? The answer may lie in the burgeoning field of soft metrics in which shades of gray and judgments that adopt a "lesser of two evils" stance can be applied to provide a justifiable answer that is not necessarily yes or no.

"Modern decision making challenges the human capacity to reason in an environment of uncertainty, imprecision, and incompleteness of information," Quirk explains. Moreover, information and attention are in one sense inversely proportional - the more information the less attention can be given to each "atom" of information.

Quirk explains that soft metrics are attributes of decision criteria that

cannot be expressed numerically but nevertheless could be the core of a computational engine that is perception-based and can work with natural language rather than number crunching. For the intelligence community involved in national defense and strategy, a disproportionate number of the decisions being made represent a matter of life.

As such, the soft metrics approach could offer them a new approach to intelligence data analysis, [risk assessment](#), [conflict resolution](#) and strategy building that circumvents the logical need for a yes-no answer.

Quirk cites the successful ranking of power substations in Washington DC so that protective resources can be allocated optimally as an example of how soft metrics might be used in decision analysis, ranking, and computing in NL. This ranking exercise addresses possible power outages and their mitigation, emergency responses, and homeland security issues.

The soft metrics approach takes non-numerical information and expert opinion and creates a set of inference rules of the type "If (...) then (...)", which can be programmed into a computer. The whole approach side-steps political and economic considerations in assessing the information in hand.

More information: "Soft metrics: What are they and what use are they" Int. J. Intelligent Defence Support Systems, 2009, 2, 335-349

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