What Would You Say You Do Here?

An Introduction to the Literature(s) on the Use of Analysis to Advise Decision-Makers

There is a diverse literature on the use of analysis to advise decision-makers that many at CNA have not formally studied. The purpose of this occasional paper is to introduce this literature (or, more precisely, these literatures) and highlight a few ideas with special relevance to work at CNA. The review is neither comprehensive nor definitive. It is a primer designed to introduce analysts to a few important ideas and invite them to explore further. The primer includes extensive citations.

CNA projects come in a variety of forms. Although some parts of this paper may have broad application, the focus is on a particular kind of CNA study. These studies begin when a sponsor comes to CNA looking for help with a decision or problem—i.e., for help deciding which of several courses of action is "best." Our task is to help them clearly define the problem and identify options for solving it. We then gather and analyze data about the problem and make recommendations based on that analysis.

An archipelago of literatures

The primer begins with a short overview of five interrelated fields that focus on the use of analysis to advise decision-makers:

- **Operations research** (OR) emerged during World War II. It is an interdisciplinary field whose practitioners typically strive to provide a "quantitative basis for decisions." Most OR techniques use math, statistics, formal models, or some combination thereof to find the optimal allocation of resources given a defined objective and a set of constraints. As such, most academic programs in OR require students to learn enough math to reliably identify and solve optimization problems.

- **Systems analysis** was born of the view that the mathematical techniques of operations research are unhelpful for a large class of decision problems facing policymakers. For well-structured problems in which the objectives are clear and quantifiable, operations research is ideal; but for problems in which the objectives are vague and useful measures hard to find, something more flexible is required. Compared to operations research, systems analysis embraces a wider range of analytical tools and emphasizes reasoned inquiry more generally (although quantification is still preferred).

- **Decision analysis** emerged in the 1960s and is best understood as an applied branch of decision theory. Conceptually, decision theory is closely related to game theory: whereas game theory is the study of interaction between multiple rational actors, decision theory is the study of one rational actor against an "indifferent environment" (or "against nature"). Distinctive features of decision analysis are the inclusion of the subjective values, uncertainties, and risk tolerance of the decision-maker, and the "decision tree"—a method of organizing relevant information that facilitates formal analysis.

- **Policy analysis** is widely considered the successor discipline to systems analysis. Early advocates of policy analysis argued that systems analysis, despite its origins, had become too preoccupied with quantification and neglected the role of values and politics in public decision-making. Policy analysis is sometimes characterized as "evidence-based advice giving" and typically involves the systematic comparison of alternative approaches to policy problems.[1]

- **Program evaluation** developed alongside policy analysis in the United States in the 1960s and 1970s. A crude but common heuristic for differentiating them is that policy analysis is forward-looking ("What should we do next?") whereas program evaluation is backward-looking ("Is this program working?"), but this distinction is often hard to draw in practice because the impetus for evaluation is often to decide what to do next. The two fields share many methods and analytical techniques, but have developed distinct textbooks, conferences, and intellectual histories.

Some important ideas[2]

The second half of the paper highlights a few ideas from the fields discussed above that analysts may find useful. The presentation is structured as an idealized analytical workflow: define the problem, identify the alternatives, evaluate the alternatives, and make a recommendation. An important theme is that subjective judgment is an inextricable part of sponsor-focused analysis.

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[1] Rachel Meltzer and Alex Schwartz, *Policy Analysis as Problem Solving: A Flexible and Evidence-Based Framework* (Routledge, 2019), p. 1.

[2] This section was drafted with the help of Morse Code, CNA's in-house large language model. The author carefully reviewed and edited the model's output before including it in this document.

Define the problem

Sponsors rarely arrive at CNA with well-defined problems; instead, they usually arrive with "problem situations" characterized by ambiguity and conflicting objectives. A critical part of CNA's mission is helping sponsors clarify and define their problems for effective analysis. This process is often the most challenging step in the analytical process because stakeholders with different goals and values often interpret the same facts differently. Problems derive from a mismatch between the current and *desired* state of the world. They are subjective evaluations of objective situations.

Analysts must balance impartiality and normative analysis to identify the "right" problem, which often involves reformulating the issue to make it analytically tractable while aligning with the sponsor's goals. This iterative process requires judgment, persuasion, and familiarity with the sponsor's context. A good problem statement must describe an issue that can be feasibly addressed through analysis and action, and often emerges only after the analyst has explored potential solutions.

Identify the alternatives

Identifying the right set of alternatives requires careful consideration because: (1) analysts will rarely have the resources to study all possible alternatives, (2) limiting the set of alternatives also limits the range of possible findings, and (3) if the best option is excluded from the analysis, the study will miss the mark. Sponsors frequently want analysts to study a specific list of alternatives, but analysts must critically assess such lists because they are often derived from a suboptimal definition of the problem and limited by cognitive biases. People tend to overlook changes that involve removing elements (subtractive changes) and evaluate risks differently based on presentation, for example, making the initial set of alternatives unlikely to be sufficiently diverse.

Evaluate the alternatives

Evaluating alternatives usually involves forecasting their consequences and measuring those consequences against specific criteria. The difficulty of this step varies depending on the nature and diversity of the alternatives. Narrowly circumscribed alternatives can often be evaluated using formal models and simple criteria. As alternatives become more diverse, modeling becomes harder and the relative importance of subjective judgment increases. In other words, it is easier to compare ships of the same class than to compare ships of different classes, and easier to compare ships of different classes than to compare ships to economic sanctions. Just as using the wrong set of alternatives can bias a study, so too can using inappropriate or incomplete criteria.

Make a recommendation

Making a recommendation may seem straightforward—simply suggest the option likely to produce the best outcome based on analysis. But only in rare cases will an alternative be the best across all criteria. Instead, the best option will usually vary across criteria, meaning recommendations can only be made conditionally. In such situations, the study's primary contribution is not identifying a single "best" alternative but clarifying the trade-offs between options and the issues at stake for the decision-maker. Critically, unless the sponsor has established a clear hierarchy of objectives, choosing the best alternative would require the analyst to impose their own values—a role they should avoid.

For further reading

Heather M. K. Wolters, Ria Reynolds, and Zack Gold. 2025. *Evaluation Guidebook: A Resource for Program Administrators and Researchers to Plan and Conduct Evaluations*. DIM-2025-U-041879-Final.

Brian McCue. 2004. *The Art of Military Experimentation*. CRM D0010079.A3 1Rev.

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