



PARDEE CENTER

Decision Support for Risk Management of Integrated Physical, Social/Behavioral and Economic Systems

Sept 8, 2020

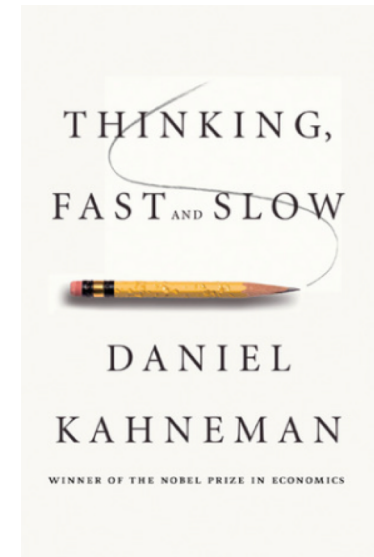
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CoPe Workshop

Decision Support Tools

Help People Make Better Decisions

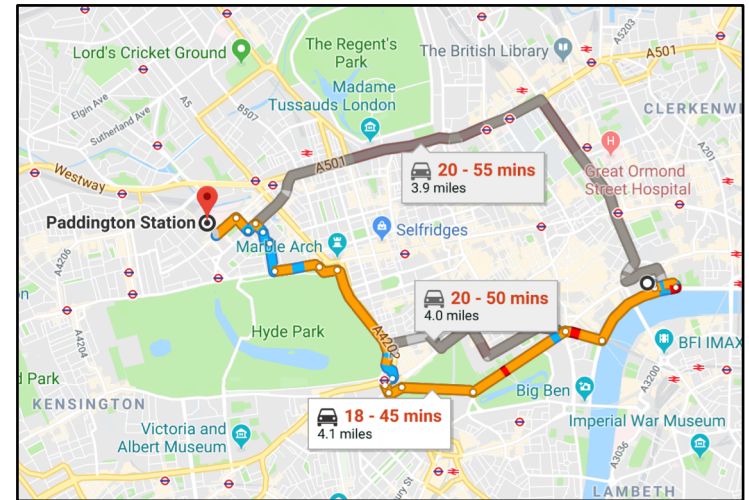
- People often make better decisions with the help of decision support tools
- The term decision support tool refers to a wide range of (often computer based) information products designed to:
 - Help counter biases in human decision making
 - Lower to effort needed to gather and process the information needed to make reasoned decisions



Some Tools Support Straight Forward Decisions

For instance, way finding apps on your smart phone are decision support tools that help you:

- Figure out where you are
- Decide how to get where you want to go
- Find the fastest route to your destination



What is a Good Decision?

- For map app, criteria is easy – did you get to your appointment on time?
- But answer is less obvious for more complex decisions,
 - Many attributes to consider
 - Counterfactuals are ambiguous
 - Consequences of decision may take a long time to unfold

What is a Good Decision?

**Seemingly reasonable decisions can turn out badly,
bad decisions can turn out well**

Good outcome \neq Good decision

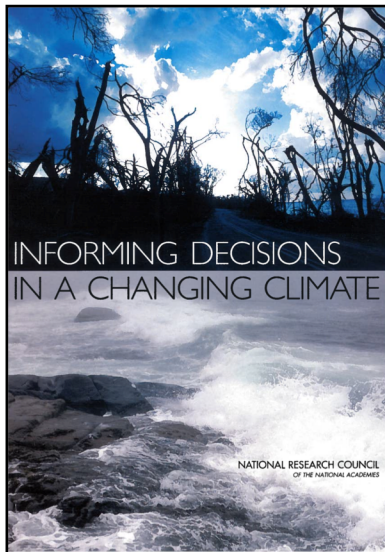
What is a Good Decision?

No universal criterion exists, but good decisions tend to emerge from processes in which people are:

- Explicit about their goals
- Contemplate the decision from a wide range of views and vantages
- Consider a range of alternative options
- Use best available science to understand the potential consequences of their actions
- Consider tradeoffs
- Follow agreed-upon rules and norms that enhance the legitimacy of the process and its outcomes

'Decision Support' Concept Helps Organize Insights from Cognitive and Organizational Literatures

Decision support represents organized efforts to produce, disseminate, and facilitate the use of data and information to improve decisions



Effective decision support improves:

- Usefulness of information:
 - Intended users regard the information as credible, legitimate, actionable, and salient
- Relationships between knowledge producers and users:
 - Producers and users engage in mutual learning and 'coproduction of knowledge' and increase mutual understanding, respect, and trust
- Decisions:
 - Decisions have qualities of a good decision and parties to the decision view it as having been improved by the support received

NRC (2009)

Effective Decision Support Rests on Three Elements

- **Products:**
 - Includes tangible deliverables such as data, maps, projections, images, tools, models, documents, brochures, web pages, etc.
- **Services:**
 - Activities, consultations, and other forms of interactions that enable decision makers to make better use of decision-relevant information
- **Systems:**
 - Individuals, organizations, communications networks, and supporting institutional structures that provide and use decision support services and produces

What Principles Lead to Good Decision Support?

1. Build from users' needs/co-produce knowledge

- Identify needs collaboratively in two-way communication between information providers and users

2. Emphasize decision processes over information products

- Design information systems and products to support decision support processes

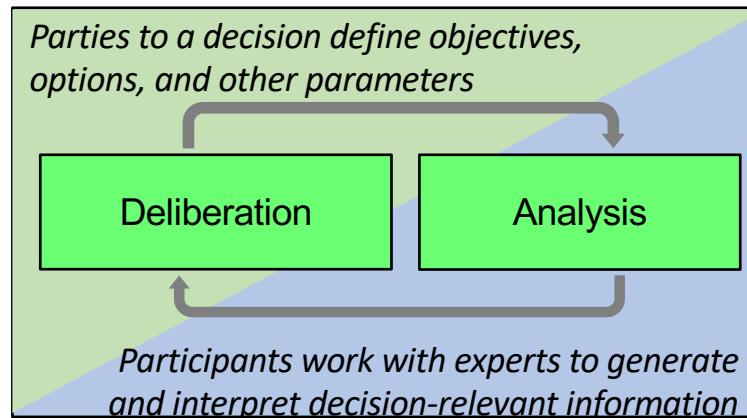
3. Design decision support for learning

NRC (2009) p. 40-41

Decision Support for Complex Coastal Systems May Support “Deliberation with Analysis”

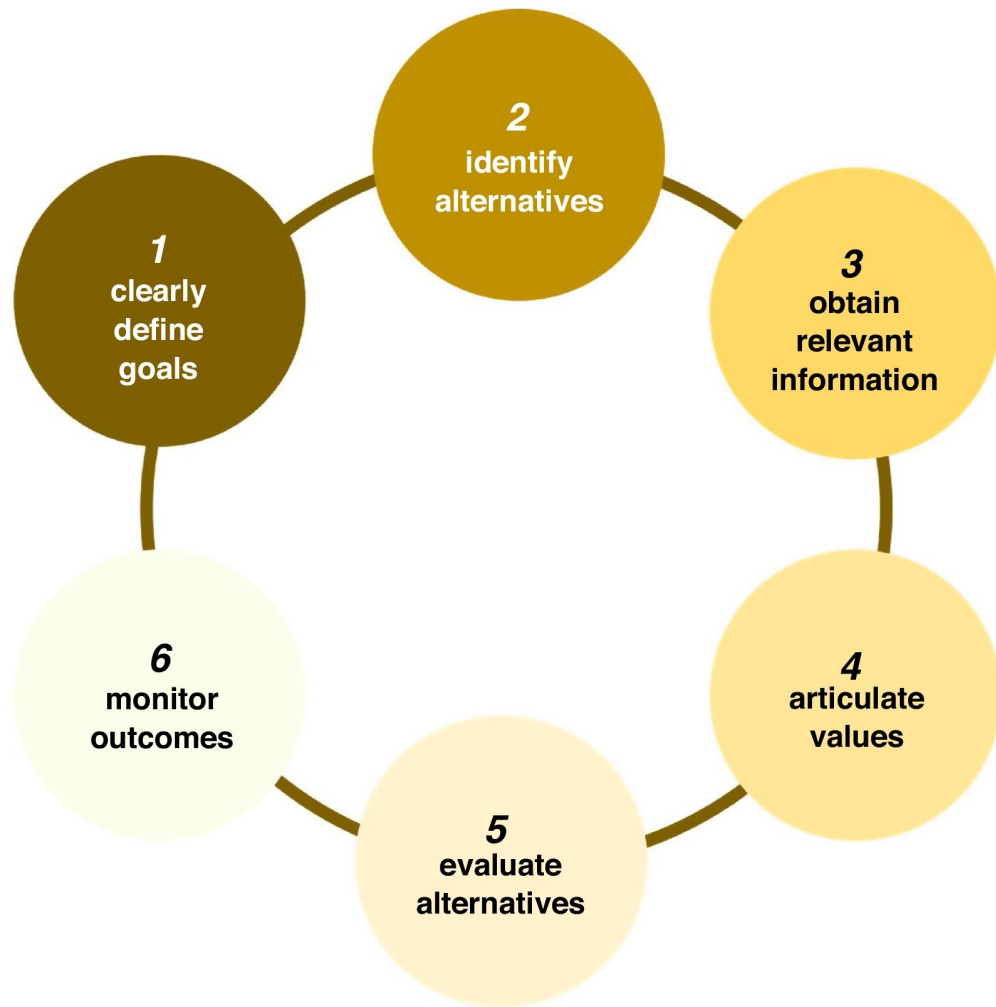
With “deliberation with analysis”

- Stakeholder deliberate over problem framing
- Analysts produce decision relevant information products



“Deliberation with analysis most appropriate when the values of pluralistic participants may evolve in response to interactions with each other and the analytic products

Your Checklist for Effective Decision Support



Current Opinion in Environmental Sustainability

Tools connected to:

- a clear decision process
- Trusting and ongoing relationship with tool developers

Adapted from: Wong-Parodi, G., K. J. Mach, K. Jagannathan and K. D. Sjostrom (2020). "Insights for developing effective decision support tools for environmental sustainability." Current Opinion in Environmental Sustainability 42: 52-59

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