

Strategic Planning under Severe Uncertainty: An Info-Gap Perspective

Yakov Ben-Haim

Yitzhak Moda'i Chair in Technology and Economics
Technion – Israel Institute of Technology
yakov@technion.ac.il, info-gap.com

Risks & Uncertainties in Systems Engineering

16 January 2018

Gordon Center

Butler Auditorium, Technion

Abstract

The search for ever better outcomes should guide the strategic planner in engineering design, public policy, international relations, economics, medical decisions and many other areas of human endeavor. However, uncertainty, ignorance, and surprise may jeopardize the achievement of optimal outcomes.

The concept of an innovation dilemma assists in understanding and resolving the planner's challenge. An innovative and highly promising new policy is less familiar than a more standard approach whose implications are more familiar. The innovation, while purportedly better than the standard approach, may be much worse due to uncertainty about the innovation. The resolution (never unambiguous) of the dilemma results from analysis of robustness to surprise (related to resilience, redundancy, flexibility, etc.) and is based on info-gap decision theory.

Info-gap theory provides decision-support tools for managing the challenges of planning and decision under severe uncertainty. We discuss the method of robustly satisfying critical requirements as a tool for protecting against pernicious uncertainty. We also describe the method of opportune windfalling as a tool for exploiting propitious uncertainty.

These ideas will be illustrated by considering one example: policy formulation for timely recovery from catastrophe.

Selected References (see also info-gap.com)

- Yakov Ben-Haim, 2006, *Info-Gap Decision Theory: Decisions Under Severe Uncertainty*, 2nd edition, Academic Press.
- Yakov Ben-Haim, 2010, *Info-Gap Economics: An Operational Introduction*, Palgrave-Macmillan.
- Michael Smithson and Yakov Ben-Haim, 2015, Reasoned Decision Making Without Math? Adaptability and Robustness in Response to Surprise, *Risk Analysis*, vol.35, #10, pp.1911-1918. Link to pre-print at: <http://info-gap.technion.ac.il/foundations-and-philosophy/>
- Yakov Ben-Haim, Craig D. Osteen and L. Joe Moffitt, 2013, Policy Dilemma of Innovation: An Info-Gap Approach, *Ecological Economics*, 85: 130-138. Link to pre-print at: <http://info-gap.technion.ac.il/ecological-and-environmental-economics/>
- Barry Schwartz, Yakov Ben-Haim, and Cliff Dacso, 2011, What Makes a Good Decision? Robust Satisficing as a Normative Standard of Rational Behaviour, *The Journal for the Theory of Social Behaviour*, 41(2): 209-227. Link to pre-print at: <http://info-gap.technion.ac.il/foundations-and-philosophy/>