Innovation Dilemmas:
An Info-Gap Perspective
With Application to Distribution Networks

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Abstract

The search for ever better outcomes should guide the decision maker in engineering design, public policy, 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 designer's challenge. An innovative and highly promising new design 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 design and planning under deep uncertainty. We discuss the method of robustly satisfying critical requirements as a tool for protecting against pernicious uncertainty.

We then consider several preliminary applications to distribution networks subject to deep uncertainty and innovation dilemmas.

Books:

- Yakov Ben-Haim, 2018, *Dilemmas of* Wonderland*: Decisions in the Age of Innovation,* Oxford University Press.
- Yakov Ben-Haim, 2010, *Info-Gap Economics: An Operational Introduction,* Palgrave-Macmillan.
- Yakov Ben-Haim, 2006, *Info-Gap Decision Theory: Decisions Under Severe Uncertainty,* 2nd edition, Academic Press.

Additional sources: info-gap.com