

The Innovation Dilemma in the Age of Technology: An Info-Gap Perspective

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Abstract

The search for ever better outcomes should guide the decision maker in engineering design, as well as in project management, public policy, economics, national security, medicine 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 decision maker'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 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 examples of engineering design.

Selected References (see also info-gap.com)

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- 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/>