The Value of Decision Analysis: An Update

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Session Outline

1. Update on questionnaire results
2. The Kodak experience
3. Some results on firm value
4. Discussion

1. Value of DA Survey

- Reply at: www.tifoe.com/vadahome.html
- Responses so far: 18
- Information is being kept confidential
- Please respond if you have not already done so!

1. Typical Decisions

- Capital investments, Portfolio analysis
- Strategic decisions
- Technology adoption
- Engineering or production decisions
- New product development
- Oil and Gas:
  - Bidding, Exploration, Value of information
  - Oilfield development, drilling strategy
- Pharmaceuticals:
  - R & D portfolio analysis
  - Go/No go decision for R&D, FDA Phase III

2. Objectives in using DA money-related?

- Yes!! (Still unanimous)
- Specifically to:
  - Increase revenue
  - Save costs
  - Enhance shareholder value

2b. Do you keep track of the value of DA?

- No -- 14
- Tracked informally -- 1
- Some documentation of value -- 1
- Value mgmt system just starting -- 1
- Carefully tracked by analyst -- 1

2c. Estimate the value of DA?

- Not measured or unknown. Unwilling to guess – n=10
- $10 - $15 Million
- “Many millions” per project “when applied well.”
- $100 - $500 million each year.
- $90 million per year on average, 1990-1999

3. Nonmonetary value of DA?

- Decision-making process:
  - Understand the problem/framing
  - Alternative development
  - Think strategically about alternatives using firm's objectives
  - Understand trade-offs inherent in alternatives
  - Capture expert knowledge
  - Understand uncertainties

Nonmonetary value (cont.)

- Decisions in the organization:
  - Source of support/justification
  - Audit decisions
  - Speed up decision making

Nonmonetary value (cont.)

- Communication and Commitment
  - Focus discussion on assumptions rather than outcomes
  - Common understanding
  - Reach consensus
  - Organizational alignment
  - Achieve buy-in of managers, stakeholders

4. Are there detractors of DA?

- YES
  - Too much time and/or money -- not worth it.
  - Modeling is not possible:
    - Problems too complex to be modeled
    - Probabilities are unreliable
    - Too much emphasis on $ versus other aspects
  - Modeling is bad:
    - Discourages creativity, intuition, “flashes of brilliance.”
    - “Too quantitative”
    - Poor analysis can produce overconfidence in decision

4. Detractors of DA, cont.

- NO
  - 3 out of 18 claim no detractors!
  - "... not practiced in the breadth of DA to have this happen."

5. How many decisions made with DA?

1%	4
2% - 9%	5
10% - 24%	3
25% - 50%	3

Firm A:

- 100% portfolio analyses
- DA-related tools used throughout organization

But differs across an organization:

Firm B:

- 90% of capital-expenditure decisions
- 100% of units use DA for strategic development
- 5% of technology decisions

2. The Kodak Experience

- Based on “The Value of Decision Analysis at Eastman Kodak Company, 1990-1999,” with Bob Kwit, forthcoming in Interfaces.
- Records kept by Bob Kwit on 178 projects over ten years.
- Download the paper from: www.duke.edu/~clemen/work.htm

Statistics for 178 projects

- Average duration: 78
- Average analyst hours: 81
- Study focus:
  - Decision and Risk Analysis: 47%
  - Strategy 16%
  - Modeling 11%
  - Portfolio Analysis 7%
  - Trade-offs 5%
  - Others 15%

How to measure value?

- Momentum strategy?
  - Records not kept
  - Not always obvious (e.g., what new product to develop?)
- Base on Expected NPV of alternatives?
  - Exactly what to calculate?
  - What about nonmonetary value?

Value measures used

- V1 = ENPV(Best Alt) – ENPV(Second best)
- V2 = ENPV(Best Alt) – Avg ENPV(All)
- V3 = ENPV(Best Alt) – Avg ENPV(Others)

Example:

ENPV for 4 alternatives:

1) **$20 m** 2) $15 m 3) $10 m 4) $5 m

- V1 = 5 m
- V2 = 8.5 m
- V3 = 10 m

Value results for 38 projects

- Total value for 38 projects ($ million):
  - V1 253
  - V2 487
  - V3 621

Extrapolating to 178 projects

- V1 $740 million
- V2 $976 million
- V3 $1300 million

- Conservative estimates, discarding incomplete projects, discounting others.
- Other data from client questionnaires confirm value.

SmithKline Beecham

- Based on Sharpe and Keelin, “How SmithKline Beecham Makes Better Resource-Allocation Decisions,” HBR, March-April 1998
- Developed DDP process for making R&D portfolio allocation decisions
- By creating better alternatives for its development pipeline, SB increased shareholder value by $2.6 billion
- Matheson reports that it took SDG three years to build up SB’s capabilities to do this.

3. Some results on firm value

- Based on presentation by Jim Matheson, "The link between organizational intelligence and business results," INFORMS November, 1999

- See *The Smart Organization* by Jim and David Matheson, HBS Press, 1998

What is “organizational intelligence”?

Defined in *Smart Organization* according to 9 principles:

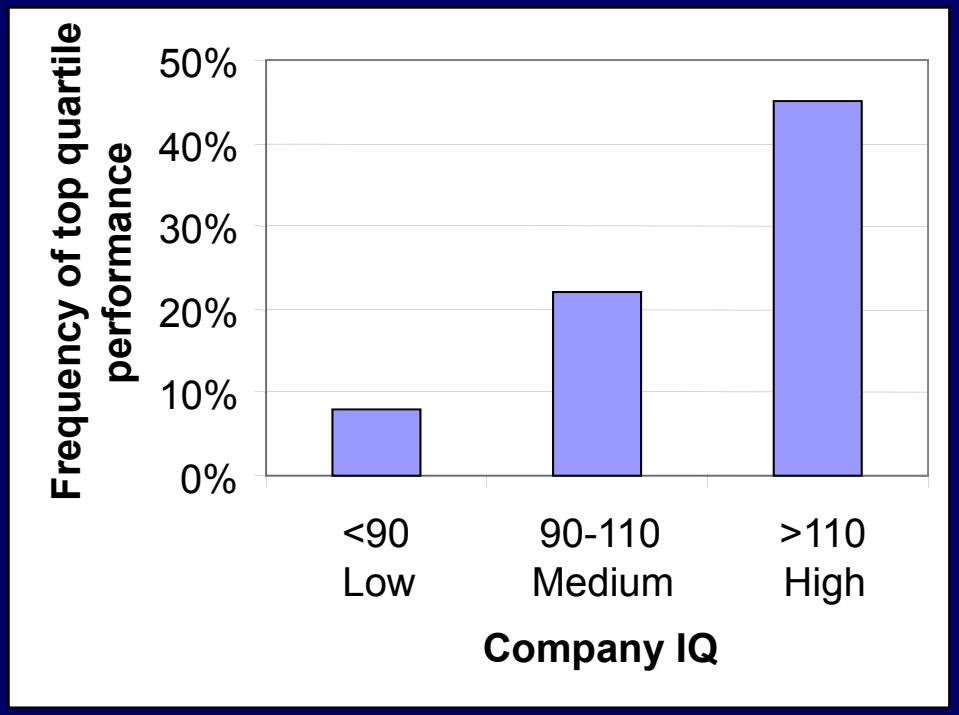
- Achieve purpose
  - Continual learning
  - Value creation culture
  - Creating alternatives
- Understand environment
  - Systems thinking
  - Embracing uncertainty
  - Outside-in strategic perspective
- Mobilize resources
  - Open information flow
  - Disciplined decision making
  - Alignment and empowerment

Data

- Questionnaire in *Smart Organization* lets organizations measure their "organizational IQ"
- In addition, ask firms to rate own
  - Market share/position
  - Profitability
  - Growth over last five years
- Aggregate performance measure:
  - 15% Mkt Share, 35% Profitability, 50% Growth Rate

Results

- "Smarter" companies perform better!



- Also, high "IQ" strongly correlated with profitable growth.

Questions for Discussion

- What evidence would show:
  - That well-done DA is worth the time and $
  - That good DA modeling can deliver insights, even in complex problems. That it can be useful to quantify subjective uncertainty.
  - That DA is not bad! It can enhance creativity, supplement intuition, and support the decision maker

Summary

- Value is large and positive!
  - $1 billion at Kodak over 10 years
  - Evidence from Matheson and Matheson shows good decision process positively associated with firm value
- Getting the evidence is not easy!
  - Respond to questionnaire
  - Keep records
  - Report your experience, share your stories.