Making Decisions

Objectives for Today

• Review models of decision-making
• Decision-making framework

Problem-Solving Framework

A. Problem definition
B. Problem solving
  1. Causal Analysis (Why?)
  2. Decision Making (What?)
  3. Action Planning (How?)

VALUES

Decision Making Framework

1. What is the decision to be made?
2. On what criteria will I base my decision?
3. What alternative courses of action exist?
4. What is the expected effect of each alternative on each criterion?
5. Which alternative is best?
6. How can alternative be put into action?

Decisions in a world of ambiguity

• “right” decision based on:
  – time
  – information
  – context of problem
  – understanding cause and effect
• Must resist impulsively selecting the most appealing or “feel good” decision

Decision making models

1. Rational Comprehensive Model
   (also called the Classical Model)
2. Administrative model

Classical Model
(Rational Comprehensive)

• List all alternatives and consequences of the different alternatives
  – assumes all information is available
• Rank each alternative
  – assumes managers possess time and mental capabilities to process information
• Select alternative(s) that lead to desired future state
  – assumes managers know desired future state

Limitations of the Classical Model

• Ambiguous Information
• Incomplete information
• Uncertainty and risk
• Time constraints
• Costs
• Cognitive limitations
  – or what book refers to as . . . .

Limitations of the Classical Model

• Incomplete information
  – assumes all information is available
  – uncertainty and risk
  – Probabilistic nature of causality
• Cognitive limitations
  – assumes managers possess mental capabilities to process information
• Resource limitations
  – Assumes managers have time for complete analysis
  – Assumes managers have money for complete analysis
• The Future State problem
  – assumes managers know desired future state
**Bounded Rationality**

- Decision making capabilities bounded by managers' cognitive limitations
- Need to make the optimum decision based on given constraints (which vary from project to project)

**Administrative Model**

- The alternative to the Classical Model
- Same idea, but acknowledges constraints
- Acknowledges *Bounded Rationality*:
  - risk and uncertainty
  - incomplete information
  - time and resource constraints
  - cognitive constraints
- Carry out Rational Comprehensive model to best of your ability, given constraints

**Risk versus Uncertainty**

- Risk:
  - Can assign probability to failure or success based on experience and/or research
  - Can predict success of a product or process, completion of a project
- Uncertainty:
  - Probabilities cannot be given for outcomes, future is unknown, little past experience
  - Managers operating blindly

**“Satisficing”**

- Adequacy not optimization is the target
- Focus on minimum targets not maximization
  - Faced with bounded rationality, ambiguous information, time and cost constraints, managers explore limited number of options and choose the “best” one rather than perhaps the “optimum”

**Cognitive Biases**

- Prior (pet) hypothesis bias
- “Representativeness” bias
  - Make improper generalizations from small sample (perhaps even a single incidence)
  - Inappropriate extrapolation or inference
- Illusion of control
- Escalating commitment
- Rules of Thumb
- Group Think
- Isolation

**Cognitive Biases**

- Prior (pet) hypothesis bias
- “Representativeness” bias
- Illusion of control
- Escalating commitment
- Manager overestimates ability to control events
- Underestimates power of others
- Escalating commitment

**Cognitive Biases**

- Prior (pet) hypothesis bias
- “Representativeness” bias
- Illusion of control
- Escalating commitment
- Committed considerable resources, can’t stop now
- Gambling psychology: “too much invested to quit”
Cognitive Biases: “Rules of Thumb”
- Avoid using rules of thumb for non-programmed (no SOPs) problem solving
- Rules of thumb characterized by:
  – the usual
  – feels right
  – always done it that way
  – yes/no or either/or questions
- Introduces systematic errors
- Eliminates possibilities of alternatives

Cognitive Bias: “Group Think”
- Rally around the bosses idea
  – “yes men”, “the brain the swivel chair”
- “Yes” managers embracing reactivity rather than long-term approaches and analysis
- Consequence: alternatives are not examined

Cognitive Bias: Isolation
- Need diverse team to combat cognitive biases
  – need theoretical knowledge
  – need practical knowledge
  – big picture person (put into context)
  – conscience of the organization (values, mission)
  – Management team
- Outside organizations
  – Regulators, stakeholders, public

Do you have a cognitive bias in problem solving?

Cognitive Bias ≠ Cognitive Limitation

Standard errors in judgment that influence how people make decisions. Often linked to assumptions about the alternatives that are available and possible in problem solving.

A limitation in abilities of an individual, group or organization to process data and information to determine causality and make decisions. One of the constraints included in the Bounded Rationality approach to decision making.

Recommended Approach
Decision Making Framework
1. What is the decision to be made?
2. Criteria by which to base decision?
3. Alternative courses of action?
4. Expected effect of each alternative on each criterion?
5. Which alternative is best?
6. How to implement alternative?

Why use a framework?
- Slow down!
- Time to explore alternatives
- Time to take in relevant information
- Ability to discriminate among alternatives
- Opportunity to include others (staff, experts, public) in decision making
- Inclusion (ownership) sets the stage for responsibility and accountability

Who to involve
- Need diverse team to combat cognitive biases
  – need theoretical knowledge
  – need practical knowledge
  – big picture person (put into context)
  – conscience of the organization (values, mission)
  – Management team
- Outside organization
  – stakeholders, public

YOU CAN BUY THESE

Prior (pet) hypothesis bias
Representativeness bias
Illusion of control
Escalating commitment
Rules of Thumb
Group Think
Isolation

Training
Knowledge
Hardware/software
Talent/ability

Training
Knowledge
Hardware/software
Talent/ability

Training
Knowledge
Hardware/software
Talent/ability
1. Decision to be made
- Decision as a choice:
  - immediate objective
  - long-term goal
- Expressed in terms of outcome of decision
- What are we seeking to accomplish?

Warren's Orchard Decision
- Problem situation:
- Decision:
- Immediate objective:
- Long-term goal:

River Basin Decision
(for NW Forest Products)
- Problem Situation:
- Decision:
- Immediate objective:
- long-term goal:

2. Decision making criteria
- What are we trying to achieve with this decision?
- Control criteria - control outcome
- Criteria should not be too constraining
- Criteria should incorporate values
- List criteria through brainstorming (don’t evaluate yet)
  - Criticism stifles creativity
- Rank criteria by importance

Warren's Criteria
- Maintain present level of production
- Consumer acceptance/marketable
- Cost effectiveness
- Minimum health risk to consumer
- Reliable control of scab
- Environmental safety
- Don’t be too specific

NFP’s Criteria
- Reduce erosion
- Minimize cost
- Provide access to harvest
- Comply with standards on road and turbidity
- Maintain fire access
- Make crew/equipment available
- Enhance or maintain image

3. Alternative Courses of Action
- Given the criteria, what can you do?
- Quality of decision limited by quality of alternatives
- What is expected effect of each alternative on each criterion?
  - Need to research (literature, experts)
  - Rely on your experience and that of others
  - Need cause and effect

Warren’s Alternatives
- Status quo – No action
- Organics/IPM
- Nova
- Resistant strains
- Treatment of leaf litter to kill fungus

NFP’s Alternatives
- Temporary culvert, meet standards in 5 years
- Meet standards now
- Grade now, abandon, rebuild in 20 years
- Grade, grass, abandon, rebuild in 20 years
4. Evaluate Alternatives
- Develop a decision matrix
- Weigh and rank each alternative based on each ranked decision making criterion
- Warren’s alternatives
  1. Status quo
  2. Resistant varieties
  3. Integrated pest management
  4. Organics
  5. Treatment of leaf litter to kill fungus

5. Rank Alternatives
- Determine how you will weight (score) the different criteria
  - Guided by “informed preference”, not “the dispassionate mathematical solution”
- Do not use a decision rule to substitute for critical thinking (avoid “weighted average trap”)
- Choose the best alternative for each criterion
- Rank the alternatives

6. First Steps to Action
- Is there an opportunity to design new alternatives?
- Decision has been made → move to ACTION
- Assign responsibilities
- Move to “Action Planning”

Designing Organizational Structure
- Organizing
  - The process by which managers establish the structure of working relationships among employees to achieve goals
- Organizational Structure
  - Formal system of task and reporting relationships that coordinates and motivates organizational members so that they work together to achieve organizational goals
- Organizational design
  - The process by which managers make specific choices that result in a particular kind of organizational structure.

Coordinating Functions and Divisions
- Authority
  - The power to hold people accountable for their actions and to make decisions concerning the use of organizational resources
- Hierarchy of Authority
  - An organization’s chain of command, specifying the relative authority of each manager
- Span of Control
  - The number of subordinates that report directly to a manager

Principle of the Minimum Chain of Command
Top managers should always construct a hierarchy with the fewest levels of authority necessary to efficiently and effectively use organizational resources to meet goals

Decision Making
In taller structures it is more difficult to incorporate input from various levels of the hierarchy – sometimes certain levels become isolated – operative in vacuum
Factors Affecting Organizational Structure

1. Environment
• Dynamic:
  - with frequent change, require flexibility
  - often need to decentralize authority and empower lower level employees
• Stable:
  - managers can make decisions within defined hierarchy of authority - SOPs
• The trend: dynamic marketplace and competition requires flexibility

2. Strategy
• Management strategies?
  - Corporate: vertical/horizontal integration
  - Business: lower cost, differentiation of product
  - Department: efficiency, quality, innovation
• vertical or horizontal diversification call for flexible
• differentiation (of product) calls for flexible
• low-cost usually calls for more formal

3. Technology
Technology: skills, knowledge, tools, machines and computers used for design, production and distribution of goods and services
• with routine technology, can have more formal structure
• as technology increases, need flexibility

More on technology:
Assessing the degree of technology
• Task variety - number of new or unexpected problems an employee encounters
• Task analyzability - degree to which programmed solutions are available
  - When high, programmed solutions available
• High Tech situation - high task variety, low task analyzability
• Routine technology - low task variety, high task analyzability

4. Human Resources
• Flexible/decentralized:
  - Highly skilled people
  - task identity - responsible for outcomes
  - task significance - meaningful work
  - feedback loop - knowing how outcomes turn out as well as affect others
• Structured:
  - low skilled employees require, and actually thrive, with a structured organization