SELF-LEARNING MANAGEMENT SERIES

DECISION MAKING ESSENTIALS

YOU ALWAYS WANTED TO KNOW

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Decision Making Essentials

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Discussion Questions 1

1. **Read the short story The Machine That Won the War by Isaac Asimov. Approach this from a systems perspective. What went wrong? How could each issue have been corrected?**

   Answer:

   There are many acceptable answers to this question. One simple systems approach is to review the input to the decision analysis, the decision analysis process itself, and the output of the process. Clearly, all three facets of the decision analysis were faulty in this story. The data could have been scrubbed before it was entered into Multivac. This is a common procedure, especially when dealing with Big Data. Any decision-analyst needs to insure the integrity of the data and put it into a usable format. The program could have been thoroughly tested before its use to ensure reliability, and the output could have been subjected to sensitivity analysis. The moral of the story is not to blindly trust a decision analysis methodology unless all of its elements have been adequately tested.

2. **In 1884, four sailors were afloat in a lifeboat at sea. They rapidly ran out of provisions. One of the sailors killed the youngest member of the four and the remaining three resorted to cannibalism to survive. The three were eventually rescued. Evaluate their decision.**

   Answer:

   Again, many answers are possible here. A Utilitarian could attempt to justify this decision by appealing to the principle of the "greatest good for the greatest number." A Kantian would not, as murder violates a categorial imperative. Most people are not pure Utilitarian or Kantian, but follow situational ethics. The facts of the situation do have an impact on the ethical decision in most cases.

3. **One problem often encountered in decision making is a lack of information. Can you have too much data when making a decision?**

   Answer:

   More data than less on the whole is good for decision analysis. However, the analyst must be careful not to overwhelm the decision-maker with data. Data visualization techniques are always helpful in describing data rather than presenting the decision-maker with just the raw data. Secondly, too much data can overwhelm the decision-maker because of limited cognitive processing capability.

Discussion Questions 2

1. **Some of the characteristics of Systems 1 and 2 were discussed in this chapter. What are some of the other characteristics of this system?**

   Answer:

   System 1 is: automatic, invents causations, generates inclinations and overconfidence, and performs skilled activities among other things. These are just a few of System 1's activities. System 2 is the "heavy duty" analytical part of the mind. You would use System 2 to answer a calculus or statistics problem for example.

2. **What are some of the organizational structures your organization has in place to prevent someone's System 1 processing from "hijacking" a major decision?**

   Answer:

   There are many possible answers to this question. The key point is any organization needs to have an approval process for decisions to assure the biases and inclinations of any one decision-maker does not hijack the decision. Internal controls also protect against simple error in the decision analysis as well.

3. **Can you think of a decision you made recently influenced by affect? If it was a monetary decision, was it impacted by your "discretionary income"?**

   Answer:

   Affect influences decisions by the feeling of like or dislike and not by objective analysis. This is an example of why an organization needs a structured decision-making process.

4. **How influenced are you by prospect theory? Without any additional facts, would you agree to the flip of a coin where you received $150 for heads and lost $100 if it was tails? Suppose you only had $100. Would you accept this bet?**

   Answer:

   Very few people would accept this bet. It is known as the Samuelson Problem, named after its originator Paul Samuelson, winner of the Nobel Prize in Economics. However, if this bet were run many times most people would take the bet. People intuitively understand anything can happen on just one flip of a coin. They also expect the mean value will assert itself over time.

5. **How susceptible are you to the endowment effect? If there was volatility in the stock market, would you "ride" out a downturn in the hopes of future recovery or profit, or would you leave the market at the first chance if you knew volatility lay ahead?**

   Answer:

   The endowment effect describes the reluctance of people to give you an asset they own or to suffer a loss. Research shows most people are susceptible to this, so many would ride out the decline in the stock market in hope of not sustaining a loss.

Discussion Questions 3

1. **Are you a patient decision-maker?**

2. **Do you wait to obtain necessary data before making a critical decision?**

Explanation for 1 & 2:

The discussion questions in this chapter are reflection questions. Patience in decision-making is a virtue provided the organization is not suffering a loss by delaying the decision. The expected value of perfect information is a critical concept in such situations. The decision-makers must ask themselves is there a potential benefit for waiting for more information? If so, how big is this benefit and what is the probability we can obtain this information in a timely manner?

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Discussion Questions 4

1. **Describe a groupthink situation you were involved in. How did the decision turn out? What were the causes of the groupthink? How could it have been avoided?**

   Answer:

   Almost all readers have experienced groupthink. The facilitator should ask the participants to describe the situation, why it happened, and what could have been done to prevent it.

2. **Have you ever participated in a brainstorming session? What was the topic? Did the session generate enough ideas? Did the suggestions flow smoothly or were they evaluated as they were made? Did hierarchy and rank interfere with the discussions?**

   Answer:

   Many participants will not have been involved in a brainstorming event. Perhaps the facilitator could arrange such a short event to demonstrate the process of brainstorming. One topic could be the characteristics of a perfect vacation spot. The problem of the perfect vacation spot will come up in a later problem.

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Discussion Questions 5

1. **One common form of scenario planning many organizations do is disaster recovery planning. Does your organization have a disaster recovery plan? If so, what are the elements of that plan and what does it encompass? How often is it updated?**

   Answer:

   The participants' answers will vary widely based on their experience. A brainstorming session would be a good way to conduct a discussion on this topic. The basic elements of a good disaster recovery plan are widely available on the internet. The instructor should research this before the discussion in order to guide the participants.

2. **You are an airline executive taking part in a scenario planning exercise. Describe some of the scenarios you want to consider.**

   Answer:

   The airline industry faces a tremendous number of scenarios. These include:

   a. Wide fluctuation in the price and availability of fuel. Suppose the price of a barrel of oil doubles? Suppose a Gulf War cuts off supply? What would the response of the airline be?

   b. Complete interruption in service. The recent pandemic is an example of this.

   c. Labor unrest.

d. Changes in regulation

e. Potential government ownership.

These are just a few that come to mind. There are many others.

Discussion Questions 6

1. **What is your personal style of decision making? What heuristic do you use most often?**

2. **Describe one successful decision you had to make recently using a heuristic method. Describe the heuristic method you used. Can you draw a decision tree to describe your decision process?**

3. **Describe one unsuccessful decision you made recently using a heuristic rule. Describe the heuristic method you used. Why was the decision unsuccessful? Did you apply an incorrect heuristic? Did you properly identify all of the decision attributes before you began the analysis?**

Explanation for 1, 2 & 3:

The discussion questions in this chapter are reflection questions for the participants. The facilitator can assist the participants by analyzing the heuristic used and whether it was applied correctly. One area for the facilitator to focus on is making sure all relevant decision attributes have been considered. The facilitator can also suggest other heuristics the participants could have considered in their individual situations.

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Discussion Questions 7

The following problems were drawn from the research of Kahneman and Tversky:

1. **A lily pad is growing in a local pond. It doubles every day. At the end of ten days the pond is completely covered. How many days did it take to cover one-half of the pond?**

   Answer:

   Nine days. When it doubles on the tenth day the pond will be completely covered. We instinctively want to answer five. This demonstrates how System 1 reacts to such questions.

2. **Linda is 31 years old, single, outspoken and very bright. She majored in philosophy in college. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations. Which of the following is more likely?**
   a. **Linda is a bank teller**
   b. **Linda is a bank teller and is active in the feminist movement.**

   Answer:

   Most participants will choose b. However, this is a logical contradiction. Bank tellers active in the feminist movement are a subset of the the population of bank tellers. There must be more bank tellers than there are bank tellers active in the feminist movement. Therefore, the most likely choice is a.

3. **Two cab companies operate in a city, the Green and Blue Cabs. 85% of the cabs are green and 15% are Blue. A cab is involved in an accident. A witness identified the cab as Blue. The judge hearing the case concluded the witness could correctly identified each of the colors 80% of the time and failed the other 20%. What is the probability a Blue Cab was involved in the accident rather than a Green Cab?**

   Answer:

   Applying Bayes Rule, there is a 41% the cab in the accident was a Blue Cab. Notice this doesn't satisfy the more likely than not or preponderance of evidence rule in a trial unless there is other corroborating evidence. What seemed like an 80% winner is now a 41% loser. This problem is taken from Daniel Kahneman's book Thinking Fast and Slow, if the facilitator wishes to have an extended discussion in class. A detailed computation can be easily found on the internet.

4. **3% of college students are computer science majors. You meet a student who you believe is four times more likely to be a computer science major than other students. What is the probability he is a computer science major?**

   Answer:

   11%. This question is a shortened version of a similar question posed by Kahneman in the same book. Again, the computation is widely available. The critical point is the base rate of 3% was adjusted upwards based on new information.

Test Your Knowledge

1. **What is the probability of drawing two jacks from a standard deck of cards if the first card drawn is replaced after the first draw?**

   Answer:

   $P(J_1 \text{ and } J_2)=P(J_1) \times P(J_2)$
   $= (4/52) \times (4/52)=.0056 \text{ or } .56\%$

2. **What is the probability of drawing two jacks from a standard deck of cards if the first card drawn is a jack and is NOT replaced after the first draw?**

   Answer:

   $P(J_1 \text{ and } J_2)=P(J_1) \times P(J_2|J_1)$
   $= (4/52) \times (3/51)=.0045 \text{ or } .45\%$

3. **What is the probability of drawing two jacks from a standard deck of cards if the first card drawn is a NOT a jack and is NOT replaced after the first draw?**

   Answer:

   $P(J_1 \text{ and } J_2)=P(J_1) \times P(J_2|J_1)$
   $= (4/52) \times (4/51)=.006 \text{ or } .60\%$

4. **What is the probability of having two girls as children?**

   Answer:

   $P(G_1 \text{ and } G_2)=P(G_G) \times P(G_2)$
   $= 50\% \times 50\%=.25 \text{ or } 25\%$

5. **What is the probability of having two girls given the first child was a girl?**

   Answer:

   $P(G_1 \text{ and } G_2)=P(G_G) \times P(G_2)$
   $= 100\% \times 50=.50 \text{ or } 50\%$

6. **What is the probability of rolling a six on two dice?**

   Answer:

   $P(6_1 \text{ and } 6_2) = (1/6) \times (1/6) = (1/36)$ or approximately 2.8%

7. **Revise the probability tree for drawing two diamonds from a deck of cards if there is no replacement.**

   Answer:

   $P(D_1 \text{ and } D_2)=(¼) \times (13/51)=(13/204)=6.37\%$

   This assumes the dice are not loaded!

Discussion Questions 8

1. **Using the SMART methodology, analyze four potential vacation spots with four different decision factors: Cost, scenery, gambling locations, and tourist sights.**

   Hint: The gambling location may be treated as either a binary decision (yes or no, or 0 and 1) or it may be ranked as any other quantitative factor. Begin your analysis by drawing the value tree.

2. **You have been offered two jobs, with the third option remaining where you are. A fourth option is attempting to negotiate an increase in salary at your current job. Perform a SMART analysis on this situation.**

   Hint: How do you factor risk into this decision? Afterall, your employer may simply fire you if you reveal you have been speaking with other potential employers!

   Explanation for 1 & 2:

   Discussion questions 1 and 2 call for the utilization of the SMART methodology to a set decision attributes developed by the participants. Participants should share their methodologies with others.

3. **Using the year 2000 as a base year, how successful were the Oakland Athletics in implementing their strategy?**

Hint: Your answer should encompass data for 20 years and be expressed as a cost-benefit analysis. For example, a Major League baseball team plays 162 game per year. There is a winner or loser in every game. Therefore, the average number of victories for every team across the league is 82 games. One meaningful way to express the data is: The average player payroll for the Oakland Athletics has been x% of the average Major League baseball team salary, but they have won "y" number of games per year. After completing the analysis, evaluate the decision to use "Moneyball" tactics.

Answer:

Discussion question 3 requires some research by the participants. In the twenty years since sabermetrics has been used by the Oakland Athletics, they have on average won more than half their games with a payroll below the major league baseball average. These statistics will change from year to year, but in the first twenty years of this century, the Athletics have won an average 86.45 games pers season, or 5.45 greater than the mean of 81. This is an astounding accomplishment as Oakland has not been higher than 25th (out of thirty) in team salaries in the past five years, for example. They regularly rank in the bottom sixth of the league in paying salaries. In short, they have been able to achieve an acceptable win-loss record at bargain basement prices.

Discussion Questions 9

1. **Go back to the previous chapter. Using the even swaps and EBA process, review your selection of vacation spots. Did your answer change?**

   Answer:

   The first question is a continuation of the Chapter 8 vacation destination, but this time using the even swaps and elimination by aspects methods.

2. **Do you satisfice when you make decisions? If so, under what conditions do you satisfice?**

   Answer:

   Question 2 asks the participants to reflect on how they make decisions. The facilitator needs to challenge the participants about their use of satisficing and its appropriateness in each circumstance.

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Discussion Questions 10

1. **Using the same example in this chapter, increase the low, most likely, and high estimate of the fixed costs by $100,000. Compute the new breakeven analysis and the high-low sensitivity analysis. Does this change the decision?**

   Answer:

   Simple inspection reveals the increase in fixed cost will have a drastic impact on the profitability of the product. The low and most likely outcomes will now be a net profit of only $50,000 and $62,500 respectively. Assuming the 25% margin holds, the breakeven sales number will be $800,000.

2. **Download one of the free Monte Carlo simulation software available on the internet. Change the parameters of the example in this chapter as follows:**
   a. **Change the distribution of sales to a uniform distribution.**
   b. **Increase the low, most likely and high estimate of the fixed costs by $100,000**

   Do these changes impact the decision? If so, why?

   Answer:

   The outcome of the simulation will depend on how many times the simulation is run. However, what can be said is the profitability will undoubtedly decrease because of the increased overhead.

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Discussion Questions 11

1. **Do threats have a place in negotiations? If so, when and how should they be utilized?**

   Answer:

   Threats do have a place in negotiations, but should be used sparingly. Threats must be credible for them to succeed. Threats may be used to signal a negotiator has no more room to maneuver.

2. **Why are presentation skills and data visualization techniques exceptionally important when dealing with Big Data?**

   Answer:

   Decision-makers can be easily overwhelmed by large volumes of data. Data visualization helps communicate the mass of data to the decision-maker in a digestible form. A presenter should always work to minimize the cognitive processing time and effort of the decision-maker.

3. **Describe the difference between a maximin and a minimax strategy. Provide an illustration of each.**

   Answer:

   They are actually equivalent strategies.

4. **The Prisoners' Dilemma seems like it is a simplistic example of game theory. Is it? Describe some other situations where the Prisoners' Dilemma applies.**

   Answer:

   The Prisoner's Dilemma has a wide range of applications. Two famous ones are in war gaming or in making decisions in an arms' race.

5. **When might you employ a mixed strategy?**

   Answer:

   Mixed strategies are best employed when you feel you are slipping into a decision pattern the opposing players in the game can detect. By randomizing your responses you force your opponent to also randomize their strategy.