Data-Driven Decision-Making Task 2

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A. What is the best course of action for MPC drug line development when considering the probability of success and payoffs based on competitive research conducted by DMA? When answering this question alternatives that are considered are implementing a new drug line, exploiting a current drug line, or continuing the current drug line. In this consideration, the probability, payoff, demand, and profits will be evaluated in both favorable and unfavorable markets.

B. The relevant data values required for this decision tree analysis, including the following:

- Probabilities of the new drug line 71% favorable and 29% unfavorable, exploiting the existing drug line 63% favorable and 37% unfavorable and continuing the current drug line 81% favorable and 19% unfavorable.
- Payoffs for the new drug line are $2734.83 favorable and $759.15 unfavorable, exploiting the existing drug line $2628 favorable and $867.36 unfavorable and continuing the current drug line $613.20 favorable and $202.44 unfavorable.
- Profits for the new drug line .63 per unit, exploiting the existing drug line at .48 per unit and continuing the current drug line at .84 per unit.
- Demand for the new drug line is high at 4341 and low at 1205, exploiting the existing drug line with a high of 5475 and low of 1807 and continuing the current drug line wth a high demand of 730 and low demand at 241.

C. The data was analyzed using a decision tree analysis by doing the following:

1. See the attached decision tree analysis.

2. The decision tree analysis is the appropriate analysis technique because we are making a decision under risk, there are several states of nature that may occur and each has a probability of occurring. Utilizing the decision tree analysis technique affords us the opportunity to select the path that produces the highest value. The risk associated with the decision is profit or loss based on the decision for the company. The states of nature we are considering are the three possible decisions which include a new drug line, exploiting an existing drug line, or continuing a current drug line. We factor in the probability, price, and demand of each to predict the risk associated with each decision.

D.

1. The role of probability in the new drug line branch states there's a 71% likelihood of a favorable market and a 29% chance of an unfavorable market. The probability states there's a 63% likelihood of a favorable market in exploiting the existing drug line and a 37% chance of an unfavorable market. The continuance of the current drug line has an 81% chance of a favorable market and a 19% chance of an unfavorable market. The role of demand is to consider how the chosen drug line will perform on its best and worst days or the highest and lowest sales volume expected in a given period of time. The probabilities role is to consider the likelihood of these different performance expectations in demand.
2. The expected value of the new drug line payoff is $2161.83, the expected value of exploiting an existing drug line is $1976.56 and the expected value of continuing the current drug line is $535.16. The expected value is determined by multiplying the high demand by the profit, then multiplying the low demand by the profit which results in high

and low payoff amounts. Then the high payoff amount is multiplied by the high probability to get the favorable market, the low payoff is multiplied by the low probability to get the unfavorable market, we then add these values together which results in the expected value. We complete this calculation for each branch of the decision tree to determine which decision will allow us to obtain our stated goal.

3.

- The data elements are limited because they are estimates
- The decision tree analysis is limited because they are expected results and are not guaranteed and can shift based on changes in nature

E. The recommended course of action is to utilize the new drug line and then exploit the existing drug line and then continue the current drug line. The current drug line has a high probability but low demand, the new drug line has a high probability and high demand.