DECISION ANALYSIS

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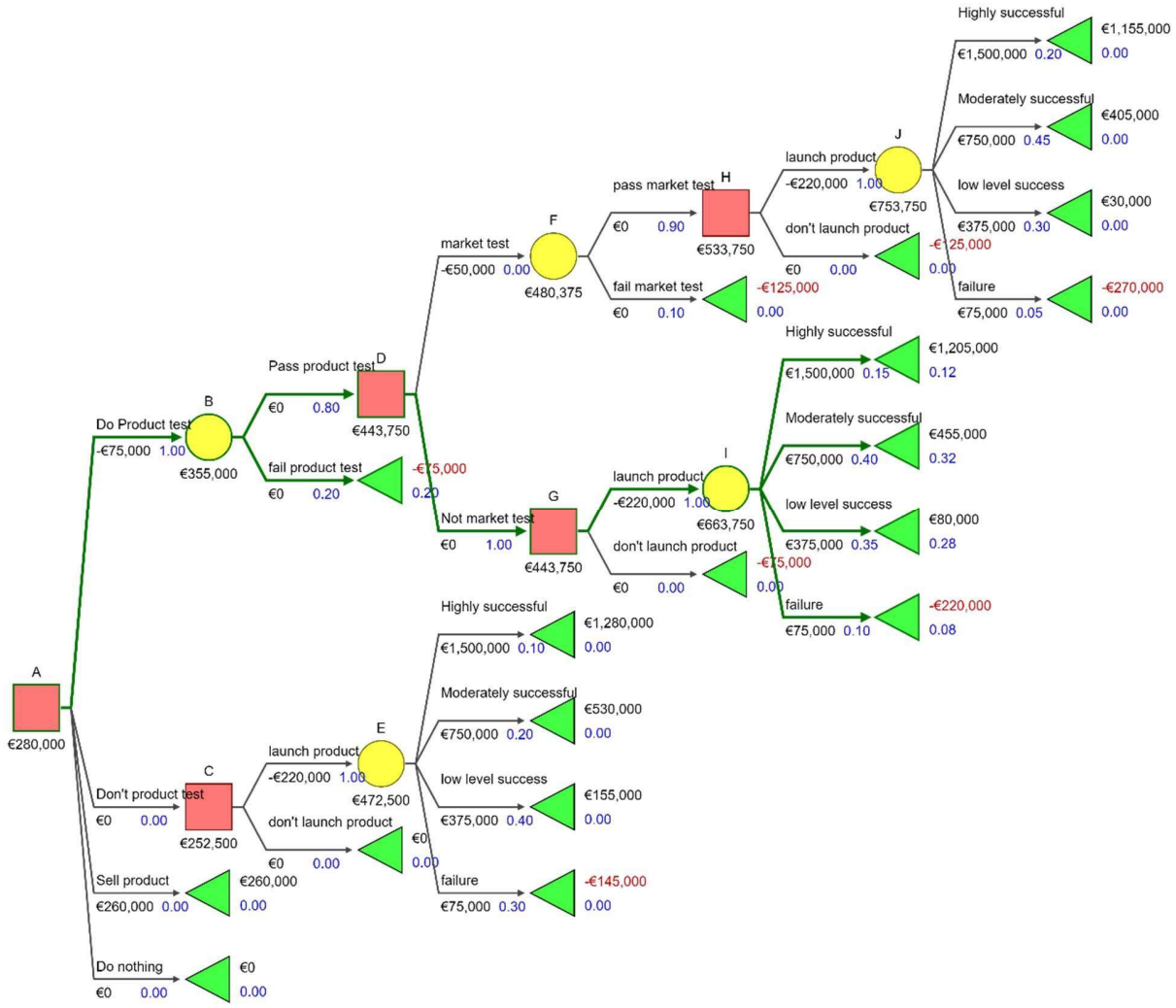
New product development problem

A. Construct a decision tree, calculate expected value at each node, and write a very brief report advising the company on its best course of action.



- The above shows the decision tree for the new product development problem
- For the expected value at each node:

EV(J) – 0.20(€1,500,000) + 0.45(€750,000) + 0.30(€375,000) + 0.05(€75,000) = €753,750

EV(I) - 0.15(€1,500,000) + 0.40(€750,000) + 0.35(€375,000) + 0.10(€75,000) = €663,750

EV(H) – {EV(J) + (-€220,000)} = €533,750

EV(G) - {EV(I) + (-€220,000)} = €443,750

EV(F) - 0.90{EV(H) + 0.10(0) = 0.90(€533,750) + 0.10(€0) = €480,375

EV(E) - 0.10(€1,500,000) + 0.20(€750,000) + 0.40(€375,000) + 0.30(€75,000) = €472,500

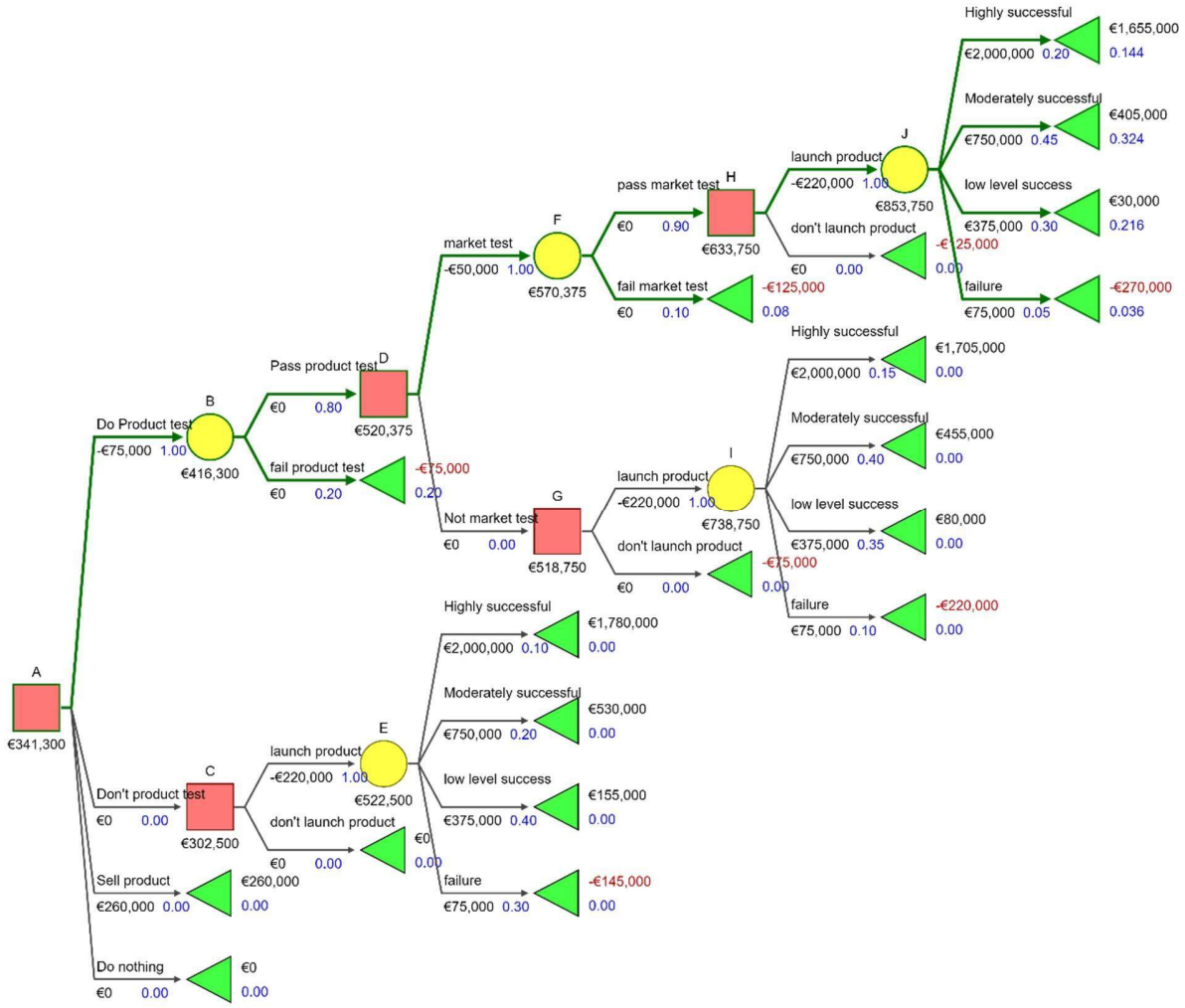
EV(D) – 0.00 {EV(F) + (-€50,000)} + 1.00{EV(G)} = €443,750

EV(C) - {EV(E) + (-€220,000)} = €252,500

EV(B) - 0.80{EV(D) + 0.20(0) = 0.80(€443,750) + 0.20(€0) = €355,000
EV(A) - 0.00(€0) + 0.00(€260,000) + 0.00{EV(C)} + 1.00{EV(B) + (-€75,000)} = €280,000

Report
With reference to the analysis done on the decision tree above, the best course of action for the company is to conduct the product test and launch the product without market test, the expected profit will be €280,000, and it will save cost of €50,000 for the company.

B. What would be the 'best' decision if the profit from the highly successful product were estimated to be €2,000,000 rather than €1,500,000?



The best decision for the company if the profit from highly successful product were estimated to be €2,000,000 will be to do the product test, conduct market test and then launch the product. The profit will be €341,300 and the expected profit for highly successful product will grow to be about 83% of the estimated €2,000,000 profit.

C. Discuss your solution to part B by listing all the possible outcomes (along with their values and probabilities) that could happen if the company is to follow the recommendation suggested by your solution.

If the company is to follow the recommended suggestion:

Highly successful product will have a value of €1,655,000 at a probability of 0.144

Moderately successful product will have a value of €405,000 at a probability of 0.324

Low level successful product will have a value of €30,000 at a probability of 0.216

The failed product will have a negative value of -€270,000 at a probability of 0.036

D. Refer to the settings specified under part B once again and imagine that you were the decision maker of this company. What would you really decide to do? Would you follow the recommendation obtained by the decision tree model? Why yes or why not

If I were to be the decision maker, I will not follow the recommendation obtained by the decision tree model because I have low risk appetite and would want to minimize many losses as possible, given that the product test alone before launch fails, I'll be at a loss of €220,000 and If I conduct the product and market test there's a loss of €220,000 if it fails. I will go for the lowest loss possible and not conduct any test before launching the new product. There is an expected value of €522,500 which is fair and in the worst-case scenario, if there is a loss it will only be €145,000 which is the lowest cost for loss on the tree. As a decision maker, I will not conduct any test and launch the product, it will save cost and minimize my losses.