Expected Value of sample (imperfect) information

Market test for National introduction of a new perfume

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BA 252

	$M, NPV
do nothing	0M.
National success	30M.
National failure	(10M.)

Estimate of national success Without Prior Knowledge:

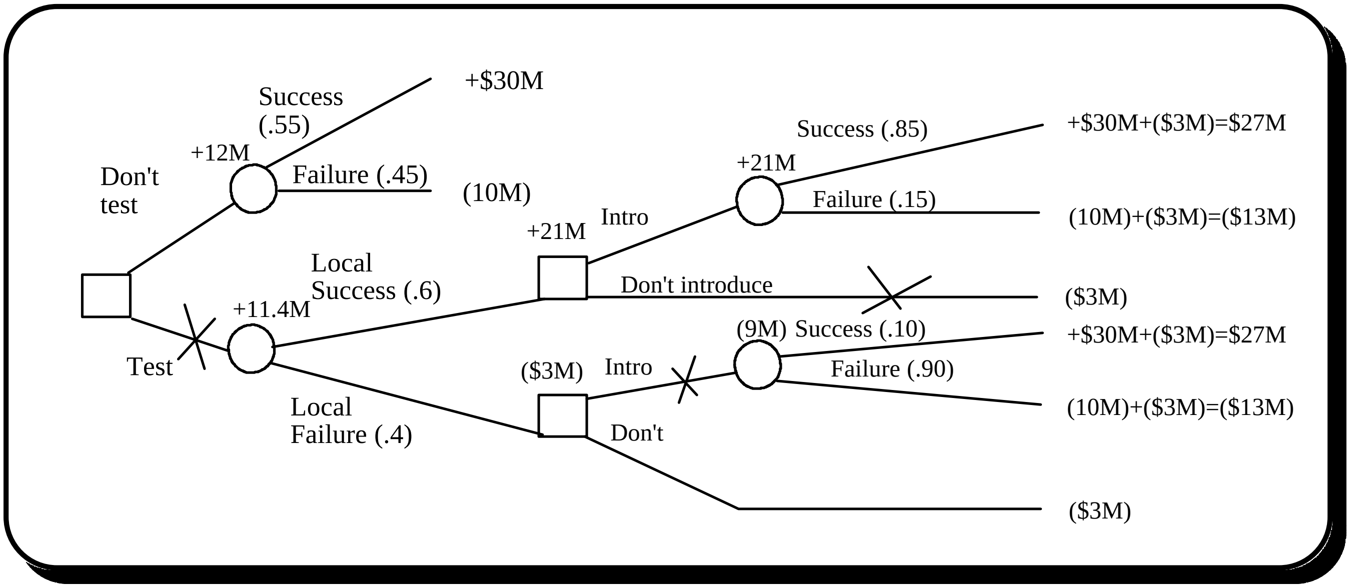
Psuccess = 0.55
Pfailure = 0.45
Cost of market test = $3M

Test outcome gives revised estimates of national rollout success:

Good test Result (P=0.6) ==> Psuccess =.85
Pfailure =.15

Bad test Result (P=0.4) ==> Psuccess =.10
Pfailure =.90

Note:
Overall $P_{success}$ = 0.6*0.85 + 0.4*0.10 =0.55
Overall $P_{failure}$ = 0.6*0.15 + 0.4*0.90 = 0.45
"Sums of the posterior probabilities must = the prior probabilities."



With Cost of the Test = $ 3 M

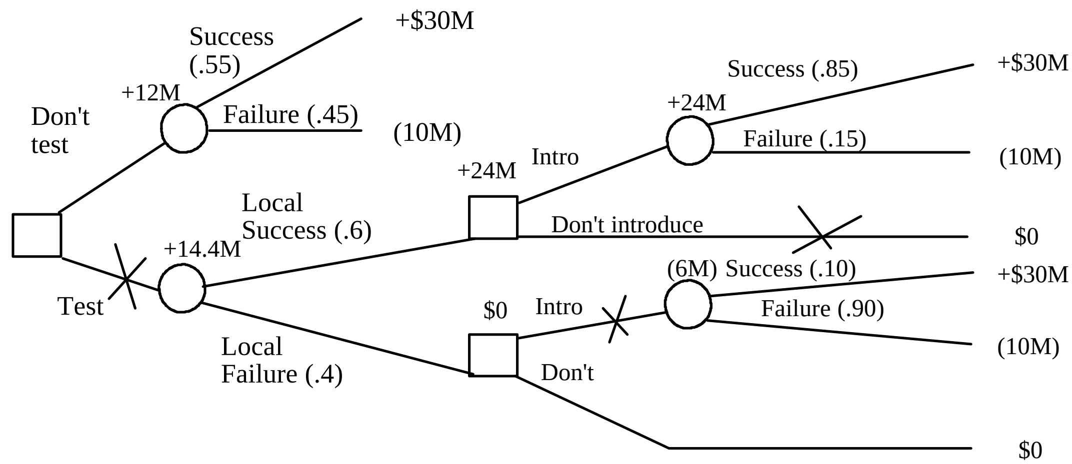
	EMV do Test =	+ 11.4 M	
less	EMV don't test =	+ 12 M	
	Difference =	- 0.6 M	(a loss!)

If we had to pay $3.0M for the test, the value of testing vs. not testing is - $0.6M. What is the value of the information from the test?

The test cost us $3M and resulted in a loss (reduction of EMV) of $0.6M. This doesn't mean the information has a negative value, it just means that we paid more for it than it was worth. Specifically, we paid $0.6M more for the information than the breakeven cost. Therefore, the breakeven cost, or value of the information is $3.0 - 0.6 = $2.4M.

Another way to look at this would be to consider how much the information would increase our EMV if it had no cost.

Change in EMV if the cost of the test were $0



With Cost of the Test = $ 0

	EMV do Test =	+ 14.4 M
less	EMV don't test =	+ 12 M
	Difference =	+ 2.4 M

The Value of the information from the test is $2.4M (Q.E.D.)

Other costs:

As an aside, other than direct costs, market testing has other costs to consider:

1. Delay- Loss of time value of money
2. Delay - missing a transient opportunity (fad or patent life)
3. Loss of surprise market advantage - Information to competitors.

A billion $/yr. product with a 36% contribution margin costs one million dollars in lost profit for every day of delay. What would it cost to get the resources to avoid that delay?

Decision Trees - Procedure:

1. Start with primary decision
2. Draw all branches (states of nature), with probabilities
3. Show secondary decisions
4. ...repeat 2 & 3 as needed ...
5. Assign values to the terminal nodes
6. Work back from the future
7. Trim branches, evaluate nodes
8. Calculate EMV's
9. Make decisions
10. Calculate EMV's for primary decision
11. Pick the biggest number (accounting)

Good Decisions aren't made.
They follow from the data.