

Legal Strategy By The Numbers:

Decision Trees, Business Value, And Managing Uncertainty

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Introduction

This brief tutorial will introduce you to decision tree analysis, a simple but powerful tool for placing dollar values on different business outcomes and selecting the best course of action. Decision trees can help you to make better, more rational choices in any area of your business. However, the emphasis here will be on legal decisionmaking, which is particularly well-suited to this method of analysis.

When talking about "legal expenses", typically the focus is on amounts others receive for helping to resolve a legal issue: attorney fees, fees paid to accountants or other experts, and disbursements (including court costs, office expenses, and travel expenses). However, for any legal problem, the value of the business outcome achieved deserves much more attention than the cost of bringing it about.

You may have paid your attorneys tens of thousands of dollars in fees, but what did their efforts do for your bottom line? Did they negotiate a much better deal than you could have without their assistance? Did they help you to win \$1,000,000 in a lawsuit (or save you from having to pay \$1,000,000 to someone else)? Could they have achieved an even better outcome if you had given them more resources to work with? Or, were legal expenses wasted on unproductive work or a subpar outcome? These questions are concerned with value rather than cost, and they are the right questions to be asking.

For smaller businesses just starting out, concerns about cost tend to dominate: you purchase whatever legal services you can afford, cut corners wherever possible, and hope for the best. This is not the ideal approach, but sometimes you have no choice. However, it is important to shift your focus to value and

business outcomes as soon as you have the resources to do so.

Decision tree analysis will help you to align legal strategy with your business objectives. You cannot rely on your attorneys to do this by themselves. In fact, you may have to force them to approach your business problems in ways that feel unnatural to them.

Most attorneys view "strategy" in a very narrow way that focuses only on legal outcomes. For example, the typical trial lawyer is a bulldog. When facing a lawsuit, he or she wants to win at any cost. This may mean hiring multiple, high-priced experts when one would suffice, filing motions that have little chance of gaining you a meaningful advantage in court, or arguing against taking even a reasonable settlement offer. If you don't keep that bulldog on a very short leash, you may not achieve the best business outcome, even if you prevail in the lawsuit.

This sort of lawyerly tunnel vision is not confined to the courtroom. An attorney negotiating a deal on your behalf may insist on reinventing the wheel when a standard form contract would get the job done just as well. He or she may spend valuable time and effort fighting over minor deal points that will have little or no impact on your business objectives and may undermine the process. Excessive caution and failure to see the forest for the trees can end up harming your business interests.

Of course, you want to work with attorneys who make the effort to understand your operations and your objectives. Even so, the important business decisions will always fall to you, and it can be challenging to apply the legal advice you receive. Most entrepreneurs struggle to harmonize what their attorneys tell them with what they know instinctively about their own businesses. Decision trees will help you to approach this process with more confidence and will give you more comfort that you are making the correct choices.

How To Build A Basic Decision Tree

Decision tree analysis is not a new concept. It has been around for decades. Business schools and even some law schools teach this problem-solving technique. However, the approach outlined here will work even if your attorney has no idea what a decision tree is. I will be showing you how to take the legal advice you receive and simply drop it into your own decision trees. Remember, you are the one driving this process.

A "decision tree" is a diagram that lays out choices you have to make and their potential outcomes. Assigning dollar values to the consequences of your actions leads to logical, unbiased decisionmaking based on value.

Figure 1 shows you the example tree that I will walk you through in this section but, first, a quick overview. All decision trees are made up of "nodes" connected together by "branches". There are only three different kinds of nodes, and each one takes a different shape.

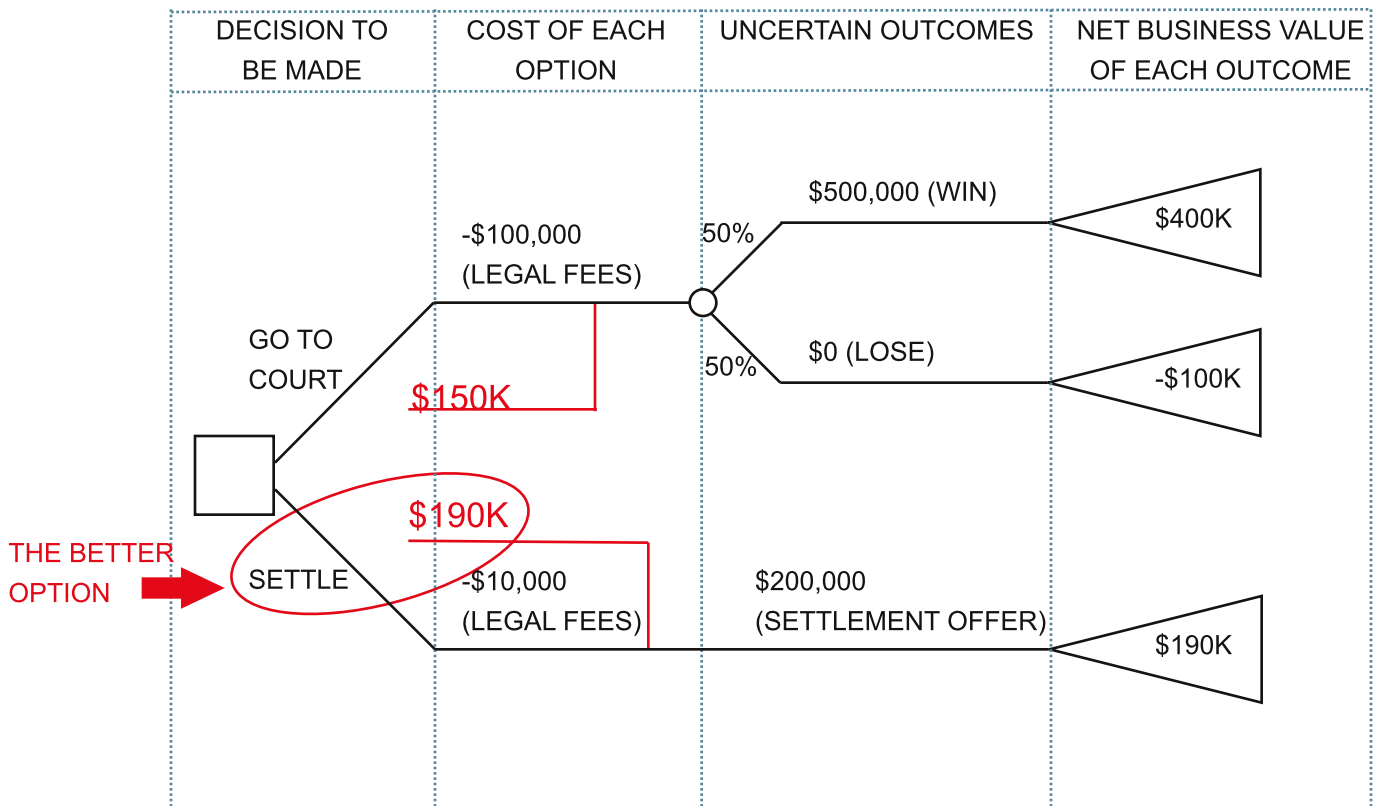


Figure 1: A Complete Decision Tree

"Decision nodes" are squares. Figure 1 contains a single decision node, all the way to the left. A decision node represents a choice that you have the power to make. You may be choosing between two options or among many options. Each option is represented by a "branch", a line that extends outward to the right of the decision node. As you can see, the decision node in Figure 1 has two branches because you only have two options.

The second type of node is a "chance node". Chance nodes are circles. There is only one chance node in Figure 1. As the name suggests, chance nodes represent outcomes that are beyond your control. As with decision nodes, there may be two or more possible outcomes to a chance node, each represented by its own branch. However, instead of choosing between those outcomes, you will assign a probability to each one.

The last type of node is the triangular "outcome node". An outcome node is an endpoint. A single branch leads into it from the left side and no branches extend out from the right side. The outcome branch is where you add up the dollar value of all costs and benefits associated with a particular outcome. You will have an outcome node for each potential consequence of your decision. In Figure 1, there are three outcome nodes.

The power of the decision tree is in its structure. The tree in Figure 1 is a very simple one, but a tree can have dozens of nodes. Even very complex trees are easy to solve because you work out each node separately, using basic arithmetic. There are even computer programs that automate the entire process, and I have included a list of the best ones at the end of this tutorial.

The decision tree in Figure 1 lays out a choice that arises frequently in lawsuits: whether or not to settle. In this example, the other side has offered to settle the dispute by paying your company \$200,000. Your other option is to reject the settlement offer and go to trial instead. However, the outcome of the trial is uncertain. Your attorney estimates that you have a 50% chance of winning more than twice as much money in court, but you also have a 50% chance of losing and walking away with nothing. Also, going to trial will cost you 10 times more in attorney fees than settling right now would.

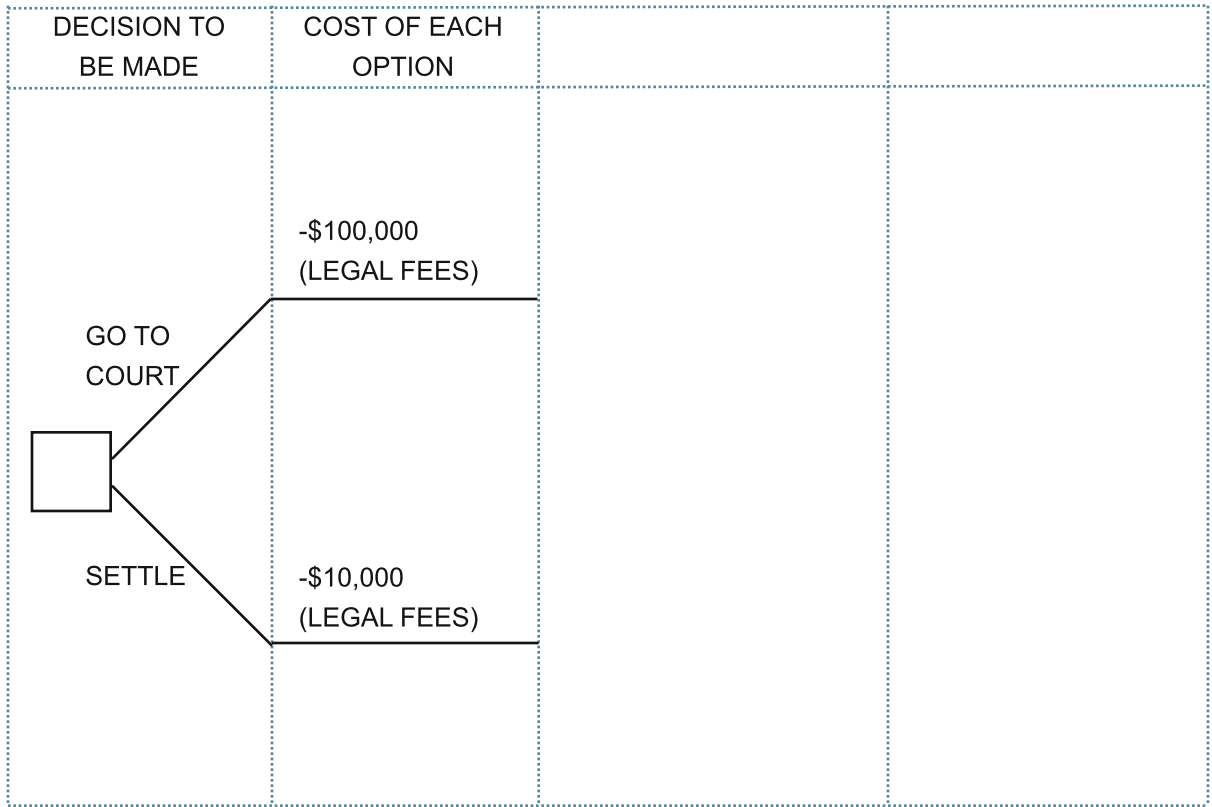


Figure 2: The Decision To Be Made

Now, we will break down the tree into smaller parts and work through them. Figure 2 shows just the decision node for a choice between two options that you have the power to make: settle or go to trial. We start by drawing a box. Then we draw two branches outward to the right, one for each choice you have. It helps to label the branches.

Each of the choices before you may have costs associated with it. We write those amounts on the appropriate lines. In this case, the costs come in the form of legal expenses. It costs much less to settle a case early because you do not have to pay your attorneys for the many months of work that go into preparing for a trial.

But how do you know whether it will cost \$50,000, \$100,000, or \$200,000 to go to trial? You cannot predict the future. These numbers will always be estimates. The key is to make them good estimates.

This is where your attorney comes in. If you have read my ebook already, then you know that I am a fan of legal budgets. At the beginning of any legal project, you should require your attorney to create a budget that estimates costs for each stage of the work.

That budget document will give you cost estimates that you can drop into your decision tree. And, if it is not clear to you from the budget how much settling now will save you over going to trial, then fire off a quick email to your attorney asking that very question. Finally, if you know your attorney well enough and think he or she has a tendency to overestimate or underestimate fees, you can adjust the estimate accordingly. This is a flexible framework, not an exact science.

Now let's move on to Figure 3. A court case is never a sure thing. If the parties knew ahead of time who would win, they probably wouldn't be in court in the first place. At the right end of the "Go To Court" decision branch, we draw a circle rather than a square. This is a chance node. As with the decision node, we

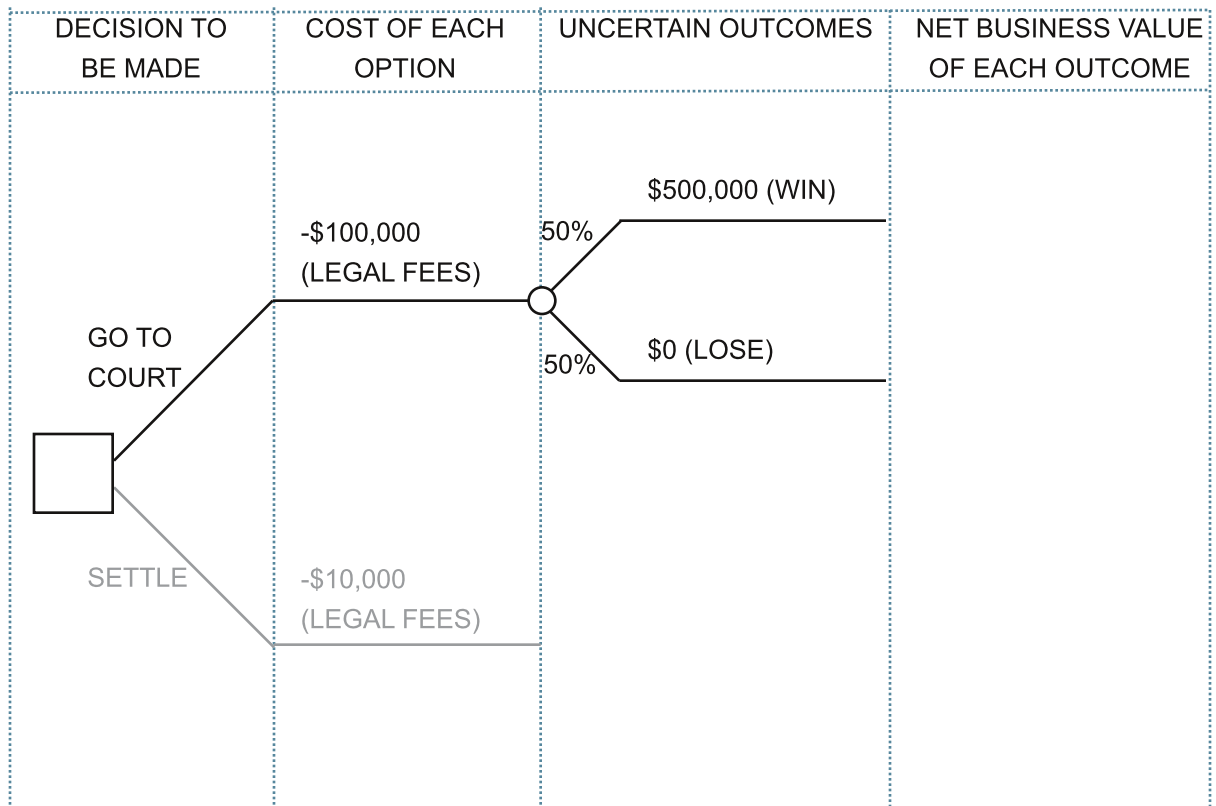


Figure 3: Factoring In The Unknown

now draw a line outward from the circle for each of the two possible outcomes: win or lose. However, if you really wanted to refine things, you could have half a dozen possible outcomes here.

Next, we assign a dollar value to each of the possible outcomes. In this example, if you win, you will recover an estimated \$500,000. This is another data point that you should be able to get from your attorney or by looking at the court documents that have been filed in the case. If you are suing the other side for \$500,000, then that is probably the most you can recover. Your attorney may have a more nuanced view. He or she may say there is also a chance you will recover only \$100,000 or \$250,000 rather than the full \$500,000. If so, you can draw a few more lines outward and to the right of the circle. As for what happens if you lose, you don't need an attorney to tell you that you will recover nothing.

There is one more step for this stage of the analysis. You have to assign a probability to each of these outcomes. In this example, I kept things simple: you have a 50/50 shot at winning in court. We write these percentages on the appropriate chance branches.

In practice, this is another place to use your attorney's expertise and input. Find out how confident he or she is about your prospects. If you have a really strong case, then maybe your attorney will say that you have a 75% chance of winning. However, if you think that your attorney is overly optimistic (or if you are a very conservative person), then maybe you will want to shave off a few percentage points and write down "65%" instead. Again, for this example, we will stick with the 50/50 estimate.

Now that we have estimated the costs of going to court, the likelihood of winning, and the value of winning and losing the case, we can calculate the "expected value" for choosing to continue the lawsuit rather than settling it.

First, we need to factor in the \$100,000 cost of going to trial. This cost is the same if you win or lose at trial, so we subtract

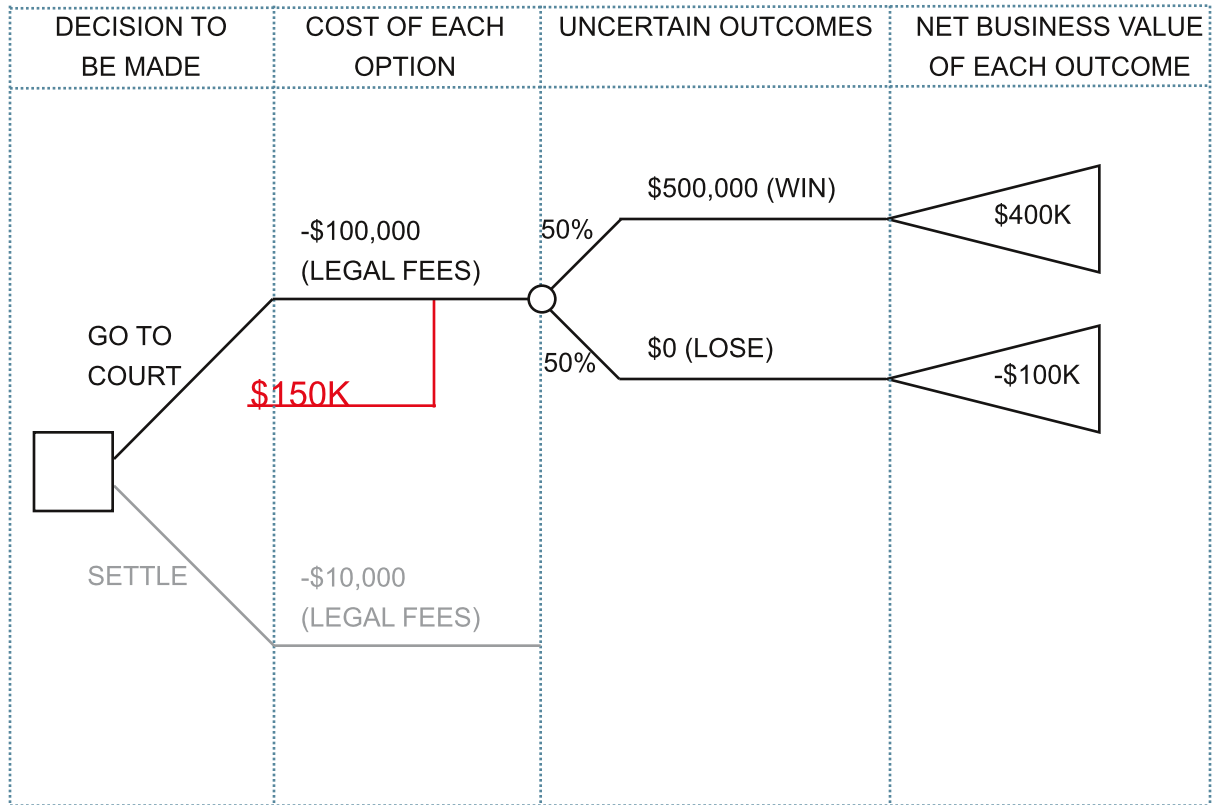


Figure 4: The Value Of Going To Court

that amount from each of the possible outcomes:

$$\text{WIN: } \$500,000 - \$100,000 = \$400,000$$

$$\text{LOSE: } \$0 - \$100,000 = -\$100,000$$

These are the possible net values of winning or losing at trial. Next, we write each of these values in the appropriate outcome node.

Now we need to account for the different probabilities. Here, you have an even chance of winning or losing, so we multiply each of the possible outcomes by 50% (0.50):

$$\text{WIN: } \$400,000 \times 0.50 = \$200,000$$

$$\text{LOSE: } -\$100,000 \times 0.50 = -\$50,000$$

Finally, we add these two numbers to get a total expected value:

$$50\% \text{ CHANCE OF WINNING} = \$150,000$$

The arithmetic may be simple here, but thinking in terms of probabilities takes a bit of getting used to. The idea, put another way, is that each possible outcome contributes to the total value based on how likely it is to occur. For example, if you estimated having a 90% chance of winning rather than a 50% chance, the value in going to trial would increase quite a bit:

$$\text{WIN: } (\$500,000 - \$100,000) \times 0.90 = \$360,000$$

$$\text{LOSE: } (\$0 - \$100,000) \times 0.10 = -\$10,000$$

$$90\% \text{ CHANCE OF WINNING} = \$350,000$$

By contrast, if there was a much better chance of losing, then the value in going to trial would be much lower:

$$\text{WIN: } (\$500,000 - \$100,000) \times 0.10 = \$40,000$$

$$\text{LOSE: } (\$0 - \$100,000) \times 0.90 = -\$90,000$$

$$90\% \text{ CHANCE OF WINNING} = -\$50,000$$

Returning to the 50/50 chance in our example, after accounting for the uncertain outcome, you value going to trial at \$150,000. To keep track of things, it helps to write that number near the choice node. (In Figure 4, the number appears in red.)

In Figure 5, we shift focus to the bottom branch of the decision tree. This is much more straightforward. A \$200,000 settlement offer is on the table. That is a certainty. Also, you know that finalizing the settlement will cost about \$10,000 in attorney time.

So, in this example, the net settlement value is \$190,000:

$$\$200,000 - \$10,000 = \$190,000$$

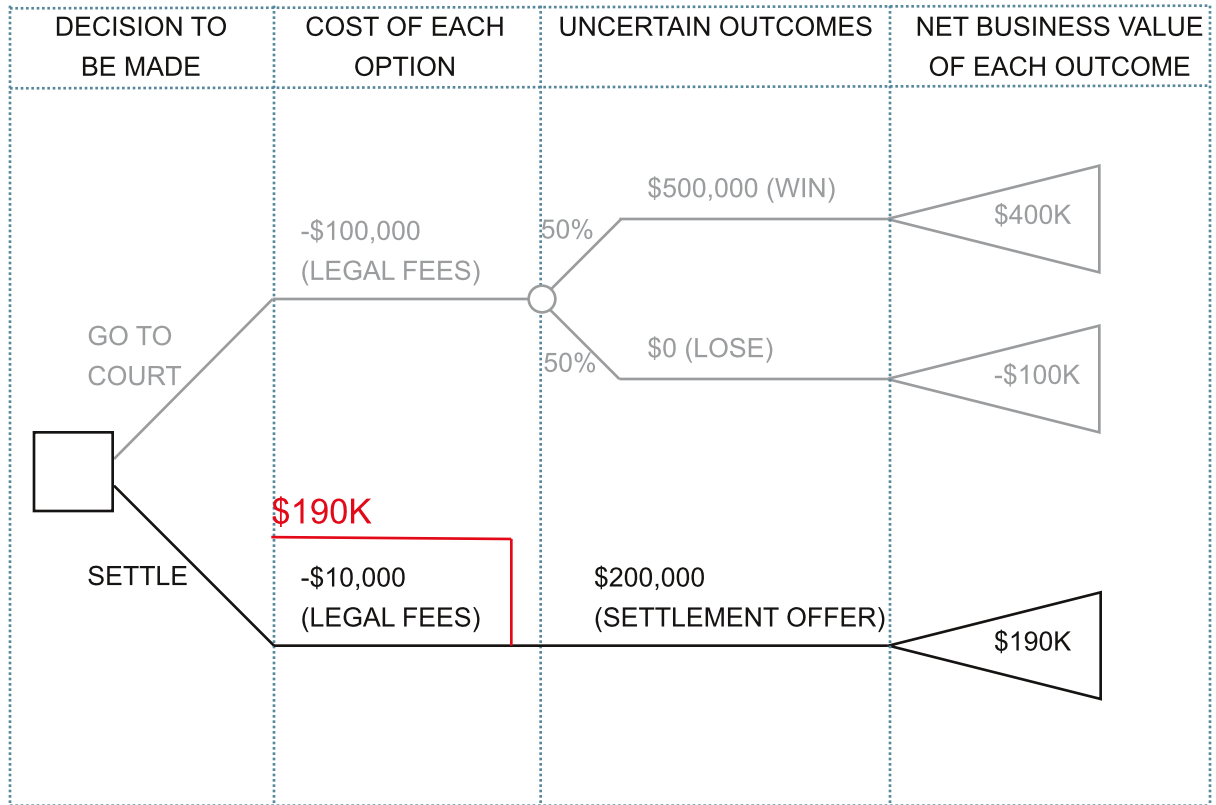


Figure 5: The Value Of Settling

We can also think about this in terms of probability. If you settle, then there is a 100% chance that you will net \$190,000. In other words, you multiply \$190,000 by 100% (1.00):

$$\$190,000 \times 1.00 = \$190,000$$

We write the net settlement value in another triangular outcome node at the right end of the lower branch. Also, to be consistent and keep track of things, it helps to write that number near the left end of the branch. (In Figure 5, the number appears in red.)

After breaking everything down into smaller parts, we are left with a choice between two dollar values: \$150,000 if you go to trial, and \$190,000 if you take the settlement offer. Therefore, in this case, it probably does not make sense to roll the dice and go to trial. Figure 6 shows you the completed decision tree.

If decision trees are a new concept for you, it may take a little while for all of this to sink in. But once you "get" it, you will find

yourself using them all the time to make business decisions (and not only ones involving legal issues). In the following sections, I want to highlight a few more advanced techniques that will help you to get the most out of your decision trees.

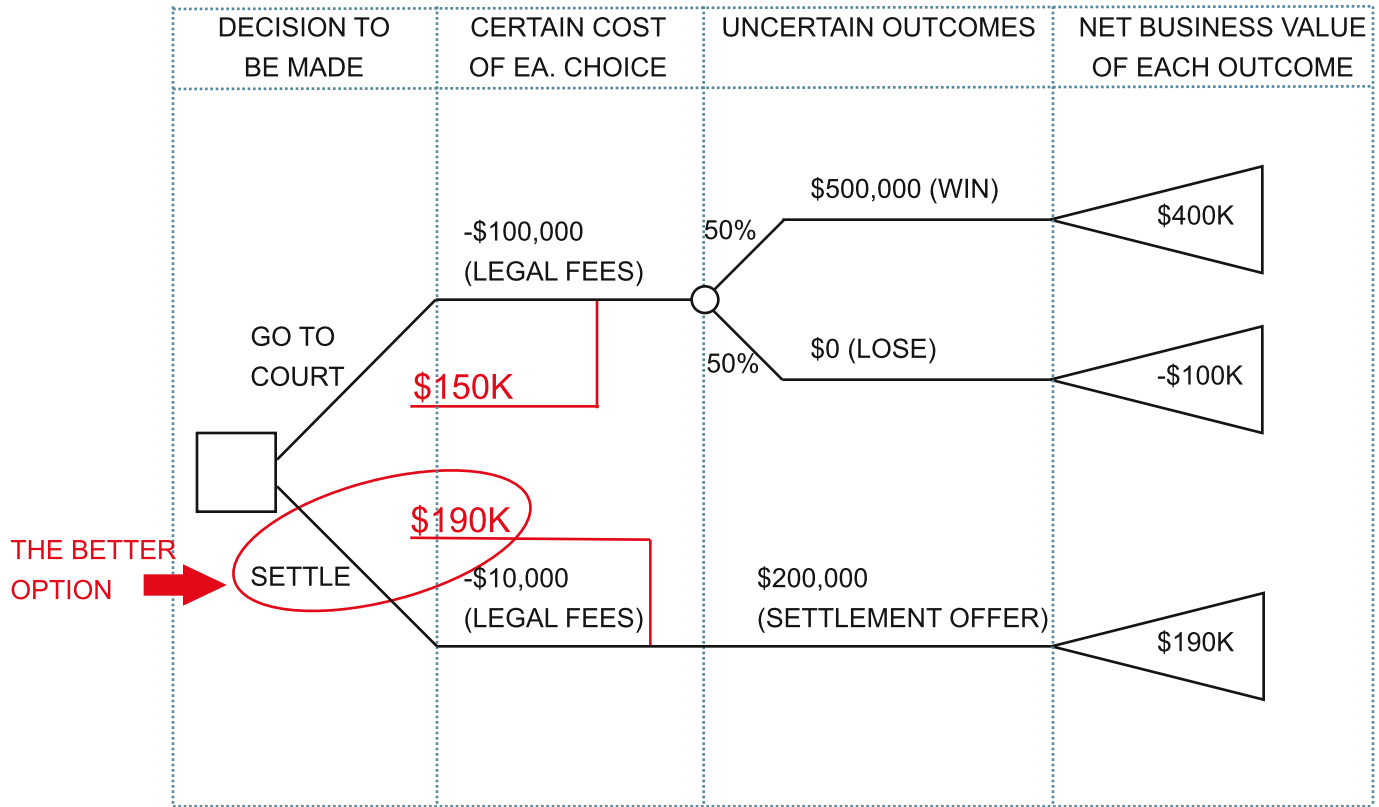


Figure 6: The Final Decision Tree, Revisited

Adding More Nodes To The Basic Decision Tree

Decision trees have a very simple structure that can be extended infinitely. In this section, I want to show you a quick example that adds another layer of complexity to the decision tree you are already familiar with. This will give you a better sense of how you can add new branches to an existing tree. There is no need to reinvent the wheel and redraw the entire tree as your circumstances change. (Of course, drawing your tree with the assistance of a computer, rather than on paper, will make it easier to alter later.)

For this exercise, we will look at another common issue that comes up in lawsuits. Any court case will involve a variety of "motions". These are documents that the parties file with the court for the judge to review. These documents, also called

"filings", describe relevant facts, discuss legal rules, make an argument, and ask the judge to take some action that affects the parties and how their dispute will be resolved. Typically, the parties will file competing motion papers, each arguing for a different outcome.

Some motions can be extremely valuable. They can win a court case early on, before it even gets to trial, or they can force the other side to accept your settlement offer. Even if it doesn't end the case, a well-argued motion can handicap the other side at trial (changing that 50% chance of winning into a 75% chance, for instance). However, a lot of motions can end up being a waste of time and resources. Here, I will show you how to use decision trees to tell which is which.

In the previous example, it made more sense to accept the settlement offer than to go to trial. In this example, we are going to add another wrinkle to that analysis: would filing a particular motion before trial increase the expected value of going to court enough that you would decide to reject the \$200,000 settlement offer?

The most labor-intensive motion you can file in court is called a "motion for summary judgment". Without getting too technical, in this motion you present all of the facts to the court and argue that there is absolutely no way that the other side can win. The idea is that it would be waste of time and money to have a trial at all, and the judge should just rule in your favor right now.

Summary judgment motions have an obvious appeal to them. Who wouldn't want to win big without even going to trial? However, as I said, these motions end up being very costly. They involve a lot of research, writing, and information-gathering by your attorneys. So, if you lose, you have added tens of thousands of dollars to your legal bill without seeing any benefit. (And there can be strategic costs, as well. You are probably tipping your hand to the other side, which may help them to better prepare for trial.) It is important to consider all of these costs when deciding whether to go to the expense of filing a summary judgment motion.

In Figure 7 (on page 14), you can see how this extra decision can be built into your existing decision tree. There are now two

square decision nodes rather than one. Also, there are three circular chance nodes rather than one. Finally, there are six outcome nodes rather than three.

The easiest way to approach this problem is to attack the decision nodes one at a time, starting with the least significant decision first. Compared to weighing a settlement offer, deciding whether to file a motion is the smaller issue, so we will start there.

First we draw a square decision node with two branches extending from its right side. We label these branches "File The Motion" and "Don't File The Motion".

Next, we estimate what it would cost to file the motion. As with all attorney fee estimates, you would get this number from the budget your attorney prepared or from a quick discussion with him or her. In this case, your attorney tells you that if you file the summary judgment motion and win, you will probably owe him \$30,000 for all of the work involved. We write that amount above the "File The Motion" branch. If you do not file the motion, then you do not have to pay your attorney for that work. We write \$0 above the "Don't File The Motion" branch.

A chance node appears at the end of each of these branches. First, if you file the motion, then there is a chance you will win that motion and there is a chance that you will lose that motion. We draw two branches outward from that chance node and label them "Win" and "Lose".

If you win the motion, then you win the entire case. As before, you know that victory is worth \$500,000. To get the net value of this outcome, you need to subtract the \$30,000 in attorney fees from that amount:

$$\$500,000 - \$30,000 = \$470,000$$

This is the best possible outcome. However, your attorney tells you that you have only a 25% chance of winning the summary judgment motion. (Considering that you are asking the judge to hand you a victory without going through a trial, it makes sense that this shortcut to victory may be a tough sell.) We write 25%

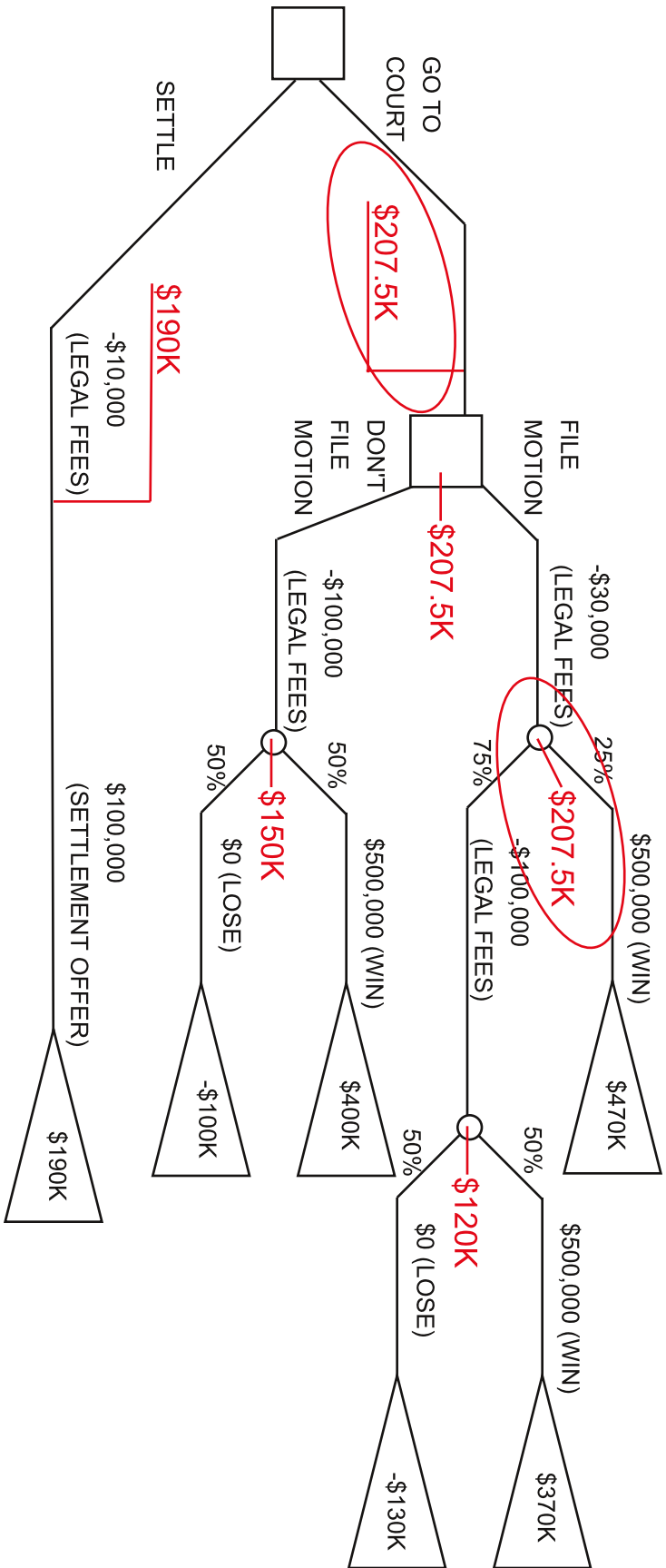


Figure 7: Adding Complexity To The Decision Tree

along the branch associated with winning the motion, and \$470,000 in the outcome node at the end of that branch.

Now, what happens if you lose the motion? You have to go through the entire trial. Your attorney has already estimated that going through the trial will cost \$100,000. We write that amount above the "Lose The Motion" branch. (Keep in mind, you would still have to pay an additional \$30,000 to your attorney for preparing the motion papers, even though you lost.)

As we saw in the last section, the trial itself adds a layer of uncertainty: you might win, you might lose. So, at the end of the "Lose The Motion" branch, we draw another circular chance node. We also draw two branches extending from that chance node. They are labelled "Win At Trial" and "Lose At Trial".

Your chances at trial are still 50/50, as in the earlier example. Winning is worth \$500,000. Losing is worth nothing. We label each branch accordingly. Now it is time to draw triangular outcome nodes at the end of the "Win At Trial" and "Lose At Trial" branches.

We label these with the net values of each outcome. If you win at trial, you recover \$500,000 minus the total attorneys fees for the motion work and the trial work:

$$\$500,000 - \$30,000 - \$100,000 = \$370,000$$

If you lose at trial, then you recover nothing and still have to pay your attorney:

$$\$0 - \$30,000 - \$100,000 = -\$130,000$$

As you can see, the risk of filing the motion and losing is that, even if you win at trial, you recover less because your attorney had to do more work and charges you \$130,000 in fees rather than \$100,000. And, if you lose at trial, you are \$30,000 deeper in the hole than if you hadn't wasted time on the losing motion.

Now, we have enough information to calculate the expected value of going to trial after losing the motion for summary judgment:

$$(\$370,000 \times 0.50) + (-\$130,000 \times 0.50) = \$120,000$$

We now write that number near the "Trial" chance node.

At this point, we have enough information to solve the "Motion" chance node. There is a 75% chance you lose the motion and go to trial (which we just figured out has an expected value of \$120,000). There is a 25% chance that you win the motion and recover \$470,000. We calculate the expected value of filing the motion as follows:

$$(\$470,000 \times 0.25) + (\$120,000 \times 0.75) = \$207,500$$

Therefore, even though you only have a 25% chance of winning the motion, the huge payoff if you do win leads to a relatively high expected value for filing the motion. We now write \$207,500 near the motion chance node.

Next we return to the decision node regarding whether or not to file the motion in the first place. We know that filing the motion has an expected value of \$207,500. The second decision branch relates to what happens if you decide not to file the motion.

We already did all of this work in the last section and can simply attach those results to the end of the "Don't File The Motion" branch of this decision node. First, we know that going straight to trial without filing the motion will cost \$100,000 in attorney fees no matter the outcome of the trial. We write that amount above the branch. We then draw a circular chance node at the end of the branch. We draw two branches extending out of the chance node. You have a 50% chance of winning \$500,000 and a 50% chance of winning nothing. We label the branches accordingly. We then subtract the \$100,000 in attorney fees to calculate the net value of each outcome. We write those amounts in outcome nodes at the end of the appropriate branches.

To repeat, this is how we calculate the expected value of going to trial without filing the motion first:

$$(\$400,000 \times 0.50) + (-\$100,000 \times .50) = \$150,000$$

Now we can make a decision about whether or not to file the motion. Because filing the motion has an expected value of \$207,500 and going directly to trial has an expected value of only \$150,000, it probably makes sense to file the motion, even though you only have a 25% chance of winning and it will cost you \$30,000 in extra attorney fees.

We circle the \$207,500 to show that you have made your decision.

At this stage, you still have the option of settling the case rather than filing the motion and proceeding to trial. As we calculated in the last section, the settlement offer of \$200,000 is only worth \$190,000 because you would have to pay your attorney \$10,000 for the work involved in finalizing the settlement. The last step is to compare the expected value of filing the motion and going to trial with the expected value of accepting the settlement offer that is on the table:

$$\$207,500 > \$190,000$$

Based on math alone, it appears that going to trial is worth more to you than settling. However, the difference is relatively small, only \$17,500.

In this situation, you really would have to ask yourself whether it was worth rolling the dice with a trial, where you could end up losing \$130,000, just for the chance to win an extra \$17,500. If it were me making that decision, I would probably take the bird in hand and settle. That said, I am a relatively conservative person when it comes to taking risks. Someone with a greater appetite for risk might be willing to take the chance and reject the settlement offer.

Alternatively, based on this information, you could ask your attorney to go back to the other side and make a counteroffer to settle the case for \$207,500 or even more than that. The other side may be willing to accept that slight increase in the settlement amount rather than risk losing \$500,000 plus whatever amount they have to pay their own attorneys.

You now have all of the tools necessary to model any legal decision you could possibly encounter. Here are a couple of points to take away from the expanded decision tree we walked through in this section:

- Decision trees can be used to model an extremely complex series of choices and unknown outcomes.
- Even though decision trees can have dozens of nodes, you do not need to keep all of them in your head at the same time. By isolating each individual node, you can work through the entire tree using basic arithmetic.
- Because decision trees are so simple to use, you should consider training your employees to use this technique, which will allow you to delegate the work rather than doing all of it yourself.
- When in doubt, label it. It is the best way to keep track of what decisions you are making at each level of the tree.
- Your attorney is a valuable resource in this process, even if he or she has never seen a decision tree before. By asking simple questions about the likelihood and value of various outcomes, you can fill in your tree with high-quality information from a trusted expert.
- That said, be flexible with the numbers. If the math suggests that you take a particular course of action, but you don't feel comfortable with that outcome, explore why you feel that way. It may be that you have a low appetite for risk or that you do not entirely trust the quality of your estimates. Feel free to play around with the numbers, increase or decrease percentages and see how those changes affect your analysis.

Decision Tree Software

You can perform a decision tree analysis on the back of an envelope without a calculator. However, there are software packages that automate laying out and solving decision trees. These programs range in cost from under \$100 to well over \$1,000. Some of these programs are complete, standalone solutions. Others are add-ins that require Microsoft Excel to perform the calculations. When you consider how much value you can create for your business by making better, more rational decisions, this software can be a great investment:

- **DPL Direct**
(<http://www.syncopation.com/products.html>)
Standalone diagramming software that includes a decision tree function. Costs about a thousand dollars.
- **Edraw Max**
(<http://www.edrawsoft.com/decisiontrees.php>)
Standalone diagramming software that allows you to construct decision trees. However, you still have to perform all calculations manually. Costs about one hundred dollars.
- **Lumenaut**
(<http://www.lumenaut.com/product.htm>)
Microsoft Excel add-in for decision tree analysis. Costs about one hundred dollars.
- **PrecisionTree**
(www.palisade.com/precisiontree/)
Microsoft Excel add-in for decision tree analysis. Costs over a thousand dollars.
- **SmartDraw**
(www.smartdraw.com)
Standalone diagramming software that includes a decision tree function. Costs a few hundred dollars.

- **TreeAge Pro Core**
(www.treeage.com)
Standalone diagramming software with a decision tree function. Costs a few hundred dollars.
- **TreePlan**
(<http://www.treeplan.com/treeplan-for-decision-trees.htm>)
Microsoft Excel add-in for decision tree analysis. Costs less than one hundred dollars.