# [Decision Tree Analysis in Litigation: The Basics](http://settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/)

###### <http://www.settlementperspectives.com/wp-content/uploads/2009/01/decision-tree-465.jpg>

A sample Decision Tree, available in [*.pdf format here*](http://www.settlementperspectives.com/wp-content/uploads/2009/01/2009_01_04_degrootekleintree.pdf).

#### I remember my first mediation decision tree. It was late in the day, just before impasse, and our mediator was desperate to show my client and me that we had misvalued the case.  As he sketched it for us the approach made sense, but that was no time to pick up a new technique.  His effort ended no different than most attempts to learn about decision trees on the fly — with a confused client, a frustrated mediator and a lawyer about to change the subject.

Fifteen years later I know the value of a decision tree and, just as important, how to really use one — in connection with settlement discussions and as a part of an [Early Case Assessment](http://www.settlementperspectives.com/2008/10/the-early-case-assessment-checklist-early-case-assessments-part-ii/) before settlement talks begin. Admittedly they take a little effort and some practice, but whether you’re a lawyer or a mediator or their client, you’ll see one soon. Knowing what a decision tree is and how to diagram yours will be worth the investment.

### What Is a Decision Tree Anyway?

Often used in the [business world](http://www.mindtools.com/dectree.html), decision trees are “tree-shaped models of [a] decision to be made and the uncertainties it encompasses,” according to [Dwight Golann](http://www.law.suffolk.edu/faculty/directories/faculty.cfm?InstructorID=26) in [Mediating Legal Disputes](http://www.amazon.com/Mediating-Legal-Disputes-Dwight-Golann/dp/0316319899). A decision tree “shows the various possible outcomes in a lawsuit and helps the parties evaluate the costs, risks and benefits of each outcome,” as [Daniel Klein](http://kleinmediation.com/profile/index.htm) discusses more fully in his article [Decision Trees & The Arboretum](http://kleinmediation.com/decision/index.htm).

Stated simply, the decision tree is a tool used to value the multiple financial outcomes possible in any litigation — whether summary judgment is granted, the plaintiff “wins” a small amount, or something else happens.

Just as important, decision trees arrive at these values by translating the subjective judgment of trial counsel into monetary terms — as [Patrick Lamb](http://www.patrickjlamb.com/archives/client-communications-speak-clearly-and-understandably.html) and [Ron Friedmann and David Post](http://www.prismlegal.com/index.php?option=content&task=view&id=54&Itemid=58) have pointed out before, your trial lawyer’s interpretation of “a good chance of winning” might be very, very different from yours. A decision tree can eliminate this latent disconnect.

### The Four Steps in Creating a Decision Tree

[Kathleen M. Scanlon’s](http://www.adradvocate.com/kathleen.html) concise and helpful [Mediator’s Deskbook](http://www.cpradr.org/CPRStore/tabid/67/ProductID/28/Default.aspx), published by [CPR](http://www.cpradr.org/AboutCPR/FAQs/tabid/284/Default.aspx#About), tells us that decision trees involve four steps:

1. Listing the various possible events which might occur in the course of litigation (or beyond);
2. Considering the costs or gains associated with each possibility;
3. Discounting each possibility by its probability-estimated likelihood that it will occur; and
4. Evaluating the overall picture by multiplying each possibility by its probability.

### Make Decision Trees Work for You

You don’t need to wait until your next mediation to learn about decision tree analysis, because putting these four steps into action isn’t hard:

* **Identify Outcomes.** Consider every outcome in your case that’s a realistic possibility — the plaintiff takes your initial [Rule 68](http://www.settlementperspectives.com/2008/09/rule-68-and-offers-of-judgment-part-i-how-they-work-and-why-you-should-care/) offer, the court grants summary judgment, you lose because you can’t get that videotape into evidence, or whatever. Once you list everywhere the case could possibly go, sketch those outcomes on a “tree” similar to the one above, reproduced in a .pdf format (with additional explanation if you scroll to page two) [here](http://www.settlementperspectives.com/wp-content/uploads/2009/01/2009_01_04_degrootekleintree.pdf).
* **Consider the Costs of Each Possible Outcome.** Once you know every path your case could realistically take, consider what it will cost to get down each path and what you’ll have to pay when you get there — and add those sums to your tree. Summary judgment may be the cheapest way out of the case for a defendant, but it’ll cost something (say, $40,000 in the example above) even if you win. It takes money to get to mediation, trial or appeal, and more money often changes hands once you’re there. Add these amounts together for each branch, and list them on the tree.
* **List the Chances That Each Possible Outcome Will Occur.** Once you know everywhere you could go and how much it should cost to get there, you’ll need to apply a little judgment to determine the chances you’ll go down each route. You have a 10% chance of a “high” verdict of $500,000 if a plaintiff’s verdict comes in and it will cost $150,000 to get there? Write it down.
* **Do a Little Math.** Ultimately you’ll add up the probability-adjusted values of all the branches on your decision tree to achieve the [expected monetary value, or EMV](http://www.eogogics.com/talkgogics/tutorials/decision-tree/), of your case. Simply calculate the value of each ultimate outcome, which is the cost of that particular result times the chances that it will occur, and add up all these figures to arrive at a final value.  In the example above with additional details appearing on page two of [this link](http://www.settlementperspectives.com/wp-content/uploads/2009/01/2009_01_04_degrootekleintree.pdf), its $124,000 EMV is nowhere near the $500,000 number the plaintiff may have focused on since he filed the case (shown above as $650,000 since the illustration includes attorneys’ fees), but it’s much higher than the $40,000 it will take the defendant to get through summary judgment, too.

The ability of decision trees to objectively highlight the real monetary value of the case, rather than the number each party may have focused on previously, is one of the key attributes of the tool, and I’ll write more about how to leverage that value here.

### A Great — and Free — Tool to Try Decision Trees on Your Own

[Dan Klein’s](http://kleinmediation.com/profile/index.htm) article [Decision Trees & The Arboretum](http://kleinmediation.com/decision/index.htm), mentioned above, is one of the best practical discussions of decision trees out there, and his website also has a free tool to compute simple decision trees called [The Arboretum](http://kleinmediation.com/decision/index.htm), where you can “create, save, and modify your own confidential decision trees”; he even has an express option where you can create a single tree without a login [here](http://www.kleinmediation.com/decision/model/dt1.asp). The decision tree at the top of this post was created using Dan’s online tool, and I’ll be pointing to it again soon.

By the way, that mediator who introduced me to my first decision tree had a point — a point that would have been better understood on mediation day if I had really known how to leverage decision trees in settlement discussions before I got there.

Try a decision tree in your next case. You’ll be glad you did.

## [2 Perspectives](http://settlementperspectives.com/2009/01/why-should-you-try-a-decision-tree-in-your-next-dispute/#comments)January 21, 2009

# [Why Should You Try a Decision Tree in Your Next Dispute?](http://settlementperspectives.com/2009/01/why-should-you-try-a-decision-tree-in-your-next-dispute/)

#### We recently explored what decision trees are and how to create them in [Decision Tree Analysis: The Basics](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/). While it’s important to revisit the basics on occasion, it seems the biggest hurdle for decision trees isn’t teaching people that this tool is out there — it’s convincing mediators, lawyers and their clients to actually try them in the first place. Why should you?

From the client’s perspective there are two good reasons to use decision trees: better decisions and happier clients.

Do we take the case to trial, do we settle it, or do we do [something in between](http://www.settlementperspectives.com/category/settlement-structures/)? And what makes you think so? Clients have always looked to their lawyers for settlement advice but, as [Ron Friedmann](http://www.prismlegal.com/wordpress/index.php?m=200808#post-834) reminds us, too often the best answer their lawyers can offer is “Trust me, I’m the expert.” Today’s clients — and their accountants and other stakeholders — want deeper analysis and better decisions, and Decision Tree Analysis is a great way to get there.

### Decision Trees Drive Better Settlement Decisions

[Geoff Sharp](http://mediatorblahblah.blogspot.com/2007/01/risk-analysis-in-mediation.html), who always has a good quote, tells us that “[g]ut instinct, sloppy guesswork and grey hair no longer seem to be enough in complex, high stakes mediation.” Sharp and others highlight how case evaluation today requires more discipline, with tools like decision trees.

Decision Tree Analysis requires more than experience and intuition — [Paul Remus](https://secure.nhbar.org/publications/archives/display-news-issue.asp?id=4329) tells us that a decision tree “forces a lawyer to think carefully and systematically about his case.” This discipline doesn’t come by accident; Montreal’s [Brian Daley](http://www.ogilvyrenault.com/en/people_BrianDaley.htm) reminds us in [a recent article](http://www.ogilvyrenault.com/files/or_passport_fall08_decisiontree.pdf) that, as client and counsel explore each branch of the tree, the diagram requires them to “deconstruct a complex lawsuit into discrete steps and possible outcomes that can pave the way for appropriate decision-making.”

So is there room for grey hair and gut instinct? Absolutely. By definition, the value of the decision tree exercise hinges on the professional legal expertise we came to in the first place — as [Ron Friedmann and David Post](http://www.prismlegal.com/index.php?option=content&task=view&id=54&Itemid=58) put it almost 20 years ago:

The key inputs to a decision tree — estimates of probabilities of the key events and of the dollar values of final outcomes — reflect the experience and judgment of the lawyer making the estimate.

As I think about my last decision tree, it’s clear that it drove a better decision than my initial take on the case. Common sense said my client had agreed to a new deal, but did we really have agreement on that contract amendment? What evidence would show it? Was that evidence admissible? Without an agreement, what would my client’s damages be?

As we have discussed before in a [different context](http://www.settlementperspectives.com/2008/10/easier-said-than-done-early-case-assessments-part-i/), careful, systematic consideration of a case by counsel is worth the investment, whether you [settle your case](http://www.settlementperspectives.com/2008/11/better-settlements-from-better-information-early-case-assessments-iv/) or [not](http://www.settlementperspectives.com/2008/11/better-docket-management-through-early-case-assessments-ecas-part-v/). But better decisions aren’t the only reason to use decision trees.

### The Client Ridealong

As the client in more than a few disputes over the years, I have seen at least three ways decision trees can make for happier clients.

**Clients Want More Information than Intuition.** Although we talked about this perspective more fully in [my first post](http://www.settlementperspectives.com/2008/08/why-are-we-here/), I’m fortunate to have been behind closed doors with the people who really decide when cases settle — CEOs, CFOs, board members and more — and I don’t get to say “Trust me, I’m the expert.” Before they make the decision to settle, real decisionmakers ask the tough questions: Will my letter get into evidence? What would drive a low verdict here? What would it cost to pursue a fraud claim? Decision Tree Analysis is one way I get the answers to these questions — before they are asked.

**Everyone Understands More After the Client Ridealong.** The step-by-step walkthrough required by a decision tree gives the client input into, and understanding of, the path the case may take — whether it settles or not.  [Marjorie Corman Aaron](http://www.law.uc.edu/faculty/profiles/aaron.php) tells us why that’s important in [The Handbook of Dispute Resolution](http://www.amazon.com/Handbook-Dispute-Resolution-Michael-Moffitt/dp/0787975389):

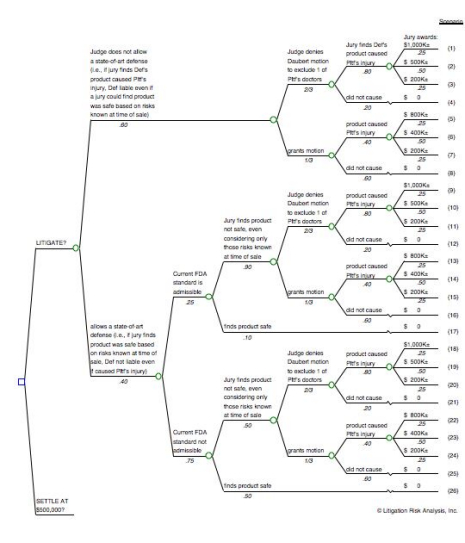
A decision tree approach requires candid discussion between lawyer and client about the likelihood of each branch on the tree, each twist in the litigation path. That discussion is always worth having. Even if the decision tree is used for nothing more than adding clarity in the conversation of trial alternatives and the client’s comfort with attendant levels of risk, the tree has added value.

This client ridealong usually draws new information from the client, and the client often gains a new perspective on the case that can change where the dispute is headed. A plaintiff who wants his day in court but now truly understands that he’s only 60% likely to see that day may decide to explore settlement, as may a defendant who learns that his insurance carrier is only 60% likely to pay.

**Decision Trees Can Add Intellectual Legitimacy.** So you have the answers and you truly understand where the case is going. Sometimes even that’s not quite enough. Many of us have decisionmakers who are driven more by numbers than rhetoric, like insurers, risk managers, and accountants, and quantitative analysis is often their language. Decision Tree Analysis can help here, too; [Marc B. Victor](http://www.litigationrisk.com/m-ov-mbv%20bio.htm) tells us at [litigationrisk.com](http://www.litigationrisk.com/frame-sw-models.htm) that decision trees “demonstrate to the client that each case has been rigorously evaluated. They document the rationale underlying your recommendations, and clearly show the effect of varying any assumptions.” I don’t know about you, but this would have helped convince a few of the accountants I have worked with in the past.

So are better decisions and happier clients reason enough to try decision trees? I hope so. I’ll post more on how you might use decision trees here soon.  But you don’t need to wait for that post to start using Decision Tree Analysis — just [give it a try](http://www.kleinmediation.com/decision/model/dt1.asp).  You’ll be glad you did.

[**Advanced Decision Tree Analysis in Litigation: An Interview With Marc Victor, Part I**](http://settlementperspectives.com/2009/07/advanced-decision-tree-analysis-in-litigation-an-interview-with-marc-victor-part-i/)

**[](http://www.settlementperspectives.com/wp-content/uploads/2009/07/advancedtree465-2.jpg)**

*A .pdf version of this advanced decision tree is available* [*here*](http://www.settlementperspectives.com/wp-content/uploads/2009/07/advance-decision-tree.pdf)*.*

**Decision Tree Analysis isn’t new to litigation, and it isn’t new to this site either — we discussed** [**the basics**](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/) **and** [**more**](http://www.settlementperspectives.com/2009/01/why-should-you-try-a-decision-tree-in-your-next-dispute/) **a few months ago.  But when you’re ready for an advanced take on the subject, where do you turn?  All roads lead to** [**Marc B. Victor, Esq.**](http://www.litigationrisk.com/frame-over.htm)**, who pioneered the application of decision tree analysis to litigation in the 1970s.**

Through his company, [Litigation Risk Analysis, Inc.](http://www.litigationrisk.com/), Marc has taught decision tree analysis in the litigation context to over 10,000 senior legal professionals, some of whom no doubt had a hand in the [American College of Civil Trial Mediators](http://www.acctm.org/) awarding Marc their [Education Award of Excellence](http://www.acctm.org/pg2.cfm) in 2003.  Marc was kind enough to guide me a bit when we began our [series on decision trees](http://www.settlementperspectives.com/category/decision-trees/) a few months ago, and I have wanted to flesh out some of the details with him since those initial discussions.  The Q&A below is the result of our recent follow-up interview.

**How did you first put together litigation management and the decision tree concept?**

It was truly fortuitous.  I was a joint JD/MBA student at Stanford in the mid-1970s and had a summer job for a company bringing an antitrust suit against IBM.  I happened to have lunch with one of our lawyers the same day the president had asked him if $10 million would be a reasonable settlement.  As our lawyer walked me through what might happen if we went to trial — “if the judge rules for us on issue 1, and the jury then finds for us on issues 2 and 3, and then believes our expert on issues 4 and 5, we’ll win a lot of money; on the other hand, if . . .” — my Decision Analysis course at Stanford came to mind.  I started sketching the tree that fit his description of the twists and turns the case could take.  Over the next few weeks, we worked with outside counsel to finish the evaluation, presented the tree and the results to the president, and the matter settled soon thereafter.

**What are the primary ways lawyers and clients are using decision tree analysis in litigation?**

I believe there are a few ways:  (i) to be sure the lawyers have a clearer understanding of the key issues, uncertainties and exposure presented by a case; (ii) to gain settlement authority from the client; (iii) to convince the other side to accept a given settlement; (iv) to persuade a mediator or settlement conference judge of the rationale of their position; and (v) to plan a cost-effective litigation strategy.

**Have you seen decision trees used effectively in mediation?**

I have been asked to present decision trees as an advocate in mediation, and it certainly helps show the mediator that my client and I have a reasoned basis for our settlement position. I have also been retained by mediators on several occasions in large cases to help the mediation process by getting the parties to agree on the appropriate decision trees, discuss arguments, and assess probabilities and verdict ranges.  These cases have typically involved hundreds of millions of dollars, and by way of example include the $1.1 billion class action settlement of the Microsoft antitrust claims in California a few years ago.

**What is the mistake lawyers and clients most often make as they learn to use decision trees in litigation?**

The first is making just a one-node “we win overall/we lose overall” tree, and another is failing to do thorough “Lists of Reasons” before coming up with probabilities in the case.

**Let’s take each of those in turn.  What’s the issue with a “one node” tree?**

Some people limit their tree to a simple “we win/we lose,” despite the fact that there may be multiple underlying questions the jury or judge will deal with that will influence the ultimate outcome of the case — evidentiary rulings, alternative causes of action, potential defenses, and other uncertainties.  The parties and their lawyers would end up with a better evaluation of their overall chances of winning and losing if they would model these underlying issues and influences in a larger tree and then use probability arithmetic to arrive at the overall result.  [Editor's Note:  More on the process can be found in Marc's article, "Interpreting a Decision Tree Analysis of a Lawsuit," available on the [articles page](http://litigationrisk.com/m-ov-articles.htm) at [litigationrisk.com](http://litigationrisk.com/).]

**And what do you mean when you say that some users fail to generate “Lists of Reasons”?**

Too many novice users of decision trees jump immediately from building the tree to filling in their probabilities.  But a probability that’s thrown onto the tree without first thinking rigorously about what the judge or jury will be weighing at trial won’t be as good as one made after doing so.  The “List of Reasons” is a summary of factors — pro and con — that the judge or jury will consider in deciding who should win each of the uncertainties represented on the decision tree.  This might be information on hand, such as key documents already in the file, but it might also include facts that could be uncovered in discovery, as well as witness strength, sympathy of the parties, and more.  [Editor's Note:  For more on Lists of Reasons, see pages 12-8 to 12-9 in "Evaluating Legal Risks and Costs with Decision Tree Analysis," which is reprinted available on the [articles page](http://litigationrisk.com/m-ov-articles.htm) at [litigationrisk.com](http://litigationrisk.com/); it also appears in the ACC's [Successful Partnering Between Inside and Outside Counsel](http://west.thomson.com/productdetail/11720/17772092/productdetail.aspx?promcode=548196).]

**As a case progresses, how often should the parties update their decision trees?**

The decision tree should be updated whenever there are new developments that would cause a significant change either to the structure of the tree itself (such as when a new cause of action is plead) or to the probabilities (because of what’s learned as discovery progresses, for example).  In addition, it’s usually a good idea to review and update your analysis prior to making a settlement decision or prior to a mediation.

**Where can I find a good example of an advanced decision tree?**

Those are almost always privileged and highly confidential, but the one on page 2 of my paper “Interpreting a Decision Tree Analysis of a Lawsuit” is a good start.  [Editor's note:  This article is available [here](http://litigationrisk.com/m-ov-articles.htm) and a .pdf of that analysis is available on Settlement Perspectives by clicking [here](http://www.settlementperspectives.com/wp-content/uploads/2009/07/advance-decision-tree.pdf).]

**And what is the mistake people most often make as their decision tree skills advance?**

As users become more advanced, I often see them putting multiple causes of action in separate trees when they should be in one tree or, if they know they should be in one tree, linking the causes of action together incorrectly.  Either of these mistakes will cause the calculation of case value to be wrong.  I also sometimes see them making trees more complicated — more academic — than they should be, forgetting that an effective decision tree should mirror the more streamlined, simpler approach juries often take when presented with complicated cases.

**If I have a working knowledge of litigation decision trees, do you have any tips on how to advance my skill set?**

I link to [7 articles](http://litigationrisk.com/m-ov-articles.htm) on my website, and continue to offer [training](http://litigationrisk.com/frame-train.htm) by appointment.  In addition, I work as a consultant to counsel and their clients on significant litigation matters.

**Is there a software product out there you recommend?**

I use [TreeAge Pro](http://www.treeage.com/products/overviewPro.html) exclusively.  It was co-founded by [Morris Raker](http://www.treeage.com/aboutUs/team.html), a Boston lawyer, after attending one of my seminars in the 1980s, and it can ship with a manual I wrote for litigators.   [Editor's Note:  Additional providers of decision analysis software are listed within the [comments](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/#comments) to our [first post](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/) on decision tree analysis in litigation.]

# [Advanced Decision Tree Analysis in Litigation: An Interview With Marc Victor, Part II](http://settlementperspectives.com/2009/07/advanced-decision-tree-analysis-in-litigation-an-interview-with-marc-victor-part-ii/)

#### For advanced decision analysis in litigation, where do we start?  Last week we began to take our [series on decision trees](http://www.settlementperspectives.com/category/decision-trees/) to the next level with [Part I](http://www.settlementperspectives.com/2009/07/advanced-decision-tree-analysis-in-litigation-an-interview-with-marc-victor-part-i/) of our interview with Marc Victor of [Litigation Risk Analysis, Inc.](http://www.litigationrisk.com/), who pioneered the use of decision trees in dispute resolution and litigation in the 1970s.  This post is Part II of that two-part interview, in Q & A format.

### Marc, people often say that the “inputs” on a decision tree — the probabilities of various outcomes — are imprecise.  One of the the [comments](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/#comments) to our [first post on decision trees](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/) put it this way:

The theoretical problem is with the assignment of probabilities and their meaning. Unless you are just goofing around with numbers, the assignment of a probability to an event presupposes that there is a frequency of similar events to count. This is hardly ever true in litigation, unless restricted to something like employment dismissal cases. Even then, I have trouble interpreting the numbers as anything more than subjective probabilities, i.e. just goofing around with numbers.

### Is this a fair criticism?

I don’t think so.  First, it’s not a question of probabilities being “precise” or “imprecise” — the idea is for them to be “realistic.”  Second, assignment of a probability does not presuppose “a frequency of similar events to count.”  A probability is simply a reflection of someone’s opinion of the likelihood of success in a particular situation.  Lawyers have always given opinions like these, even in one-of-a-kind cases — they’ve simply used phrases (such as “pretty good chance”) much more often than they’ve used numbers.  But because it’s very easy to show that the phrases are more ambiguous than the percentages, and because centuries-old probability theory tells us how to combine a 60% chance of success on one issue and a 25% chance of success on another issue to determine the overall chance of success (but doesn’t help us to combine a “pretty good chance” on one issue and a “definite possibility” on another), there are tremendous advantages in using the 0 to 100 scale rather than the “no chance” to “sure thing” scale.  I can’t help but think that if the person who wrote the earlier comment heard his or her doctor say “I’m ‘reasonably confident’ you’ll come through this procedure without any complications,” they would immediately ask for clarification:  “What do you mean by ‘reasonably confident’?  95%? 80%? 65%?”  Why should clients expect less from their attorneys?

### Anything else?

Definitely.  The commenter suggests there is something wrong with subjective probabilities — that they are nothing more than “goofing around.”  I have a very hard time equating the rigorous process of developing a thorough List of Reasons (as discussed in [Part I](http://www.settlementperspectives.com/2009/07/advanced-decision-tree-analysis-in-litigation-an-interview-with-marc-victor-part-i/) of this interview), and then expressing an unambiguous opinion regarding the chance of winning versus losing an issue, as “goofing around.”  Well-reasoned “subjective” probabilities are quite helpful — and are exactly what lawyers (and doctors and senior business executives and others) have always been hired for:  “Based on all of your experience and the information you have available to you counselor (or doctor or senior executive), what’s your best guess of my chances?”  And if the advisor has good judgment, then both theory and practice have shown that using his or her subjective probabilities to calculate probability-weighted average values (”expected values”), and then using these average values to make decisions, will lead to better results across the decision-maker’s entire portfolio of problems over time.  And what’s the alternative?  Refuse to give opinions?  How is a client (or patient or board of directors) supposed to choose between alternatives (like settle or go to trial, have the surgery or hope for the best, invest millions or don’t invest) if they are given no sense at all of their expert’s opinion of success or failure for each of the risky alternatives?

### I once had an actuary tell me that, because the future is uncertain, his numbers were almost certainly wrong, but he believed they were less wrong than guessing outcomes with no analysis.  Can the same be said for Decision Tree Analysis?

Definitely!  Identifying the underlying uncertainties that will impact your overall results, making reasoned guesses about each of those, and using proven probability theory to combine the pieces has to be better than no analysis at all.  I like to say that because every defendant’s decision whether to pay $X or go to trial (or, if plaintiff, take $X rather than go to trial) NECESSARILY involves thinking about the chances of doing better or worse at trial, it’s best to make those guesses as explicit and unambiguous as possible.  This allows others to better understand your thought process and how you reached your recommendation, and it allows you to explore how sensitive your decision is to each of your underlying judgment calls.  [Editor's Note:  more on sensitivity analysis can be found at pages 12-17 to 12-18 in "Evaluating Legal Risks and Costs with Decision Tree Analysis," which is reprinted available on the [articles page](http://litigationrisk.com/m-ov-articles.htm) at [litigationrisk.com](http://litigationrisk.com/); it also appears in the ACC's [Successful Partnering Between Inside and Outside Counsel](http://west.thomson.com/productdetail/11720/17772092/productdetail.aspx?promcode=548196).

### By now we have all seen decision trees, which help us visualize the various turning points in a case.  Are there other ways to graphically represent the results of a decision tree?

It's relatively easy to summarize the results of a decision tree in a graph that orders the range of potential results from low to high and shows the relative likelihood of each.  This is illustrated in most of the papers available at [litigationrisk.com](http://litigationrisk.com/).  In addition, sensitivity analysis graphs -- that show how the expected value of litigating varies as the probability of success on a particular issue is varied -- are another useful analytical result easily derived from the decision tree.  Some are illustrated on page 12-18 of "Evaluating Legal Risks and Costs with Decision Tree Analysis" [available on the [articles page](http://litigationrisk.com/m-ov-articles.htm) at [litigationrisk.com](http://litigationrisk.com/)].  In addition, as clients begin to assess the probability of an event occurring, I often present them with a “probability wheel,” which is shown on page 12-10 of the same article, to help them visualize their chances of winning or losing.  This has proven to produce more realistic assessments.

### Who are some of the advanced decision tree users out there?

At this point I shouldn’t mention names, but major oil companies, utilities, insurers, financial institutions, and others are repeat users.

### Decision Tree Analysis is often associated with defense counsel.  Are plaintiffs’ lawyers using it, too?

If you mean plaintiffs’ personal injury lawyers, probably very few — though the benefits of doing so apply equally to both sides.  But companies (or even government agencies) considering or involved in litigation will use the techniques to be sure they want to bring the case in light of the often steep costs of litigation, as well as to help plan pretrial and settlement strategies.

### Besides lawyers and clients, who else out there is using decision trees in litigation?

We’ve already discussed their use by mediators (in [Part I](http://www.settlementperspectives.com/2009/07/advanced-decision-tree-analysis-in-litigation-an-interview-with-marc-victor-part-i/) of this interview).  Judges in some cases might also need to use decision trees.  I’m not sure if you have seen it, but you might want to read Judge Posner’s opinion in the Reynolds case [[Reynolds v. Beneficial National Bank](http://openjurist.org/288/f3d/277/reynolds-v-beneficial-national-bank), 288 F.3d 277 (7th Cir. 2002)], which I cite in my paper “The Role of Risk Analysis in Dispute and Litigation Management” [available on the [articles page](http://litigationrisk.com/m-ov-articles.htm) at [litigationrisk.com](http://litigationrisk.com/)].  In his opinion, Judge Posner reversed a proposed class action settlement, using in part the following analysis [at pages 284-285]:

[T]he judge should have made a greater effort (he made none) to quantify the net expected value of continued litigation to the class, since a settlement for less than that value would not be adequate.  Determining that value would require estimating the range of possible outcomes and ascribing a probability to each point on the range . . ..

After outlining a hypothetical valuation of a litigation and calculating its net expected value, the court continued:

. . . our point is only that the judge made no effort to translate his intuitions about the strength of the plaintiff’s case, the range of possible damages, and the likely duration of the litigation if it was not settled now into numbers that would permit a responsible evaluation of the reasonableness of the settlement.

And as my coauthors and I wrote in the above-cited article, “If clients and circuit judges now expect risk analyses, judges, mediators, shareholders, and the SEC may not be far behind.  Outside counsel had better be ready.”

### Is there a criticism of decision trees out there that you feel is unjustified?

Some lawyers will criticize some decision trees as being too complicated.  Assuming the tree was correctly done, but is still complicated, then I like to say that the tree is never more complicated than their real problem (i.e., than the underlying dispute that’s being modeled).  And I ask whether they think they can do a better job keeping track of all the pieces and combining them to form a sound opinion about case value — (1) by doing it in their head or (2) laying it out explicitly in a decision tree.

# [Decision Trees in Mediation: A Few Examples](http://settlementperspectives.com/2010/04/decision-trees-in-mediation-a-few-examples/)

#### It’s no secret that I believe [decision trees](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/) can make a difference as you try to settle your next lawsuit, and my [series](http://www.settlementperspectives.com/category/decision-trees/) on decision trees will tell you why.  But I’m not the only one.  Your comments to my prior posts, our follow-on discussions since then, and a little research confirm that a confident minority of mediators and litigators use them, too.  This post is the first of three over the next few weeks that will give you real-life examples of how decision trees are used to settle disputes.

How do mediators and advocates use decision trees in mediation? A month or two ago we had a great discussion among the [Commercial and Industry Arbitration and Mediation Group](http://www.linkedin.com/groups?gid=1964382&trk=myg_ugrp_ovr) on [LinkedIn](http://www.linkedin.com/) styled [“Do You Use Decision Trees in Your Mediation Practice?”](http://www.linkedin.com/groupAnswers?viewQuestionAndAnswers=&gid=1964382&discussionID=14092149&sik=1270549229318&trk=ug_qa_q&goback=.ana_1964382_1270549229318_3_2) More than a few mediators and negotiators spoke up, with each providing insight into how decision trees can help get your case settled.  I’ll highlight some of those tips, and a few more from other sources, in this and subsequent posts over the next two weeks.

### A Better Way to See the Dispute

Portland area mediator [Debra Healy](http://www.healycms.com/) summarized the thoughts of many when she said that mediators can use decision trees as a “visual, tangible reality check”:

It can be so difficult for a client with no experience with litigation to even fathom the scope of uncertainties involved. Add to this that the client may not understand when his/her attorney is posturing. If his/her attorney says something, the client takes it at face value and hangs on every word. . . . I primarily use decision trees as a visual, tangible reality check.

### A Way to Work with “Quantitative Sorts”

Pittsburgh mediator and civil engineer [Rebecca Bowman](http://www.linkedin.com/profile?viewProfile=&key=27770597&authToken=FxeG&authType=name&goback=%2Eana_1964382_1270549229318_3_2) mediates complex technical disputes, and provides some insight into why decision trees work well with “quantitative sorts”:

Engineers and many accountants generally prefer finite things. It can be extremely powerful to have a clean, concrete decision tree to evaluate risk. Quantitative sorts find it very comfortable to wrap their heads around a 60% probability of an outcome of X dollars. Fold in a time prediction and they can fold in a time-value-of-money factor. If you can show the parties a way to reduce the mushy, often gut-feel outcome predictions to something concrete that they can evaluate, it has been my experience that they are much more likely to march directly to a resolution. Of course, this requires that you understand the decision tree intimately so that you can help them to make appropriate predictions. But that’s what they pay us the big bucks for, right?

### A “Dash of Ice Water” for Clients

Dallas mediator [Richard Faulkner](http://www.linkedin.com/profile?viewProfile=&key=50519092&authToken=bfc8&authType=name&goback=%2Eana_1964382_1270549229318_3_2) described how decision trees can serve as “a dash of ice water” to clients’ expectations:

If the parties, or any of them, are inclined toward using logical approaches, [decision trees] can be very effective. However, I use it only after I have obtained as much of the decision point percentage analysis information as possible from the party’s attorney. That allows me to use a combined set of techniques. First, I ask counsel to provide me an evaluation of the probable outcome if the case is not settled. That is usually offered in generalized language like, “a good chance”, most probable etc. We all know as experienced lawyers that means “50 -50″, “60 – 40″ etc to us. The client is typically thinking far higher percentages. I then ask for the lawyer to quantify in numbers their percentage evaluations or evaluation ranges for me. Those “numbers” and “ranges” tend to surprise many clients, which then helps me change the client’s expectations through rigorous reality testing. After that dash of ice water, I will sketch out the “Litigation Risk” analytical decision tree based on their lawyers numerical percentages. We then work towards settlement using that information and modifying it as necessary when new information is learned. It can be a very powerful technique with any parties that are mathematically inclined or impressed. Of course, I always reminded my advanced mediation students to remember Mark Twain’s quip, “There are lies, there are damnable lies, and then there are statistics.” . . . If this does not work in the mediation, it can then later be used as the basis for a “Mediator’s Dynamite Charge” follow up.

### A Credible Perspective for Upper Management

New York litigator and arbitrator [Philip J. Loree Jr.](http://www.loreelawfirm.com/attorneys_ploreejr.php), who blogs at the [Loree Reinsurance and Arbitration Law Forum](http://loreelawfirm.com/blog/), uses decision trees as he analyzes cases with his clients’ executives:

I have found decision trees to be a valuable tool to help advise clients of the settlement value of complex cases. Often times the client is looking for something with some basis in logic and science to help convince upper management to authorize a settlement number, and a decision tree can provide that kind of support. Predicting settlement value is part art and part science and one should draw on both disciplines when putting together a decision tree. The nice thing, though, is the end product looks more like science than art, and that can boost its credibility in the eyes of upper management.

### Helping Clients See the Hurdles

UK mediator [Philip Hesketh](http://www.heskethmediation.com/) argues that clients see the case — and understand the rigor of their counsel’s analysis — through decision trees:

Decision trees can help clients who want a valuation based on more than your legal intuition. Working through a decision tree with your client will show them that you have vigorously evaluated each aspect of their claim. They will know each and every hurdle in their way and understand how you have assessed each.

(Hat tip to [Jacob Ruytenbeek](https://paperchace.com/decision-trees/about/) at the [Decision Tree Analysis Blog](https://paperchace.com/decision-trees/2010/03/another-decision-tree-resource-for-mediators/) for leading me to Philip’s article.)

### Settlements that Stick

Washington lawyer [Patrick F. Hofer](http://www.troutmansanders.com/patrick_hofer/), a former student of decision tree pioneer [Marc Victor](http://www.litigationrisk.com/frame-over.htm), commented on a [prior Settlement Perspectives post](http://www.settlementperspectives.com/2009/07/advanced-decision-tree-analysis-in-litigation-an-interview-with-marc-victor-part-i/) that decision trees help parties get to the actual value of the case, resulting in settlements that stick:

I have successfully used decision trees to settle dozens of cases . . ..  I have used them to convince opponents of the reasonableness of my client’s deal – from in-house counsel at a large multi-national conglomerate, who viewed themselves as God’s gift to the law, to the owner of a dry-cleaner who didn’t have a high school diploma. In every case I settled using a decision tree, the deal stuck and did not come unglued or get retraded, because both sides saw the value in the deal they made. Decision trees are amazingly effective, efficient and powerful tools to get parties to settle their differences.

### You Need More Than a Tool

There’s no question that decision trees can improve your mediation results, and the perspectives above show us why.  But you need more than a tool — [ADR Toolbox’s](http://www.adrtoolbox.com/) [Don Philbin](http://www.adrtoolbox.com/don-philbin/summary-bio/) has reminded us that decision trees are helpful, but at the end of the day they’re “just another tool in the mediator’s toolbox”.

So what does get the deal done?  Bethesda mediator [Daniel Preston Dozier](http://www.presspotterlaw.com/Attorneys/Daniel-P-Dozier.shtml) helps us with that:

[A decision tree] can look more like science than art; the ’science’ can assist a negotiator sell a settlement to internal decision-makers. But in the end the settlement is generally art — perhaps realistic art, but art none the less.

Yes, settlement is art — but add a little science to your art with a decision tree next time.  You’ll be glad you did.

# [Avoiding the Limitations of Decision Trees: A Few Tips from Mediators Who Use Them](http://settlementperspectives.com/2010/04/avoiding-the-limitations-of-decision-trees-a-few-tips-from-mediators-who-use-them/)

#### No tool is perfect, and [decision trees](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/) are no exception.  A few of the comments on prior posts in this [series](http://www.settlementperspectives.com/category/decision-trees/) have explored some of the problems mediators and advocates have with decision trees and what we can do about them.  Today we’ll explore both the problems some mediators see in decision tree analysis and how those mediators make the tool more effective for parties and their counsel.

### Garbage In, Garbage Out

Garbage in, garbage out is a problem in all forms of data analysis.  In decision tree analysis every input — from numerical values to probabilities to the construct of the diagram itself — affects the output, or the expected monetary value of your case.  Los Angeles mediator [Joseph C. Markowitz](http://www.jcmarkowitz.com/p/background-and-experience.html) summed it up nicely in [Quantifying Uncertainty](http://www.mediate-la.com/2010/03/quantifying-uncertainty.html):

One [kind of uncertainty that decision trees can never resolve] is the “garbage in, garbage out” kind of uncertainty. When a lawyer says he has a 60% chance of prevailing on a claim, all that represents is a seat of the pants feeling about the case. That is not to say that the lawyer’s assessment is wrong — it could be based on years of experience and some pretty good hunches about what juries might do with a case. But it is also not a very firm number to start with. And when you start with a very unscientific probability number as a basis for calculating the value of a case, you are conveying a degree of certainty about the ultimate value that is probably not warranted. Add in the uncertainties about things like appeals over issues that have not even materialized yet, and you are dealing with a whole lot of uncertainty.

How do you avoid the GIGO problem?   As [Geoff Sharp](http://www.geoffsharp.co.nz/about/) told us in [Risk analysis in mediation](http://mediatorblahblah.blogspot.com/2007/01/risk-analysis-in-mediation.html), “[g]ut instinct, sloppy guesswork and grey hair no longer seem to be enough in complex, high stakes mediation.”  This is the time, as Montreal’s [Brian Daley](http://www.ogilvyrenault.com/en/people_BrianDaley.htm) [reminds us](http://www.ogilvyrenault.com/files/or_passport_fall08_decisiontree.pdf), for client and counsel to “deconstruct a complex lawsuit into discrete steps and possible outcomes that can pave the way for appropriate decision-making.”  There’s no shortcut to rigorous analysis and candid evaluation, and I can’t make up one here.

### Avoiding the “Black Box Syndrome”

[Don Philbin](http://www.adrtoolbox.com/don-philbin/summary-bio/), a Texas mediator and negotiation consultant (whose post [ADR Decision Tree — Fit the Forum to the Specific Issues](http://www.adrtoolbox.com/decision-resources/adr-decision-tree/) is one of the most creative and useful tools out there), tells us by way of our recent discussion on LinkedIn’s [Commercial and Industry Arbitration and Mediation Group](http://www.linkedin.com/groups?gid=1964382&trk=myg_ugrp_ovr):

[Decision trees] are interesting graphics that help engage the frontal cortex. The chief criticism seems to be that they take a number of wild guesses and roll them back to a very precise number that often is not one of the remedies available in the case. So I’ll usually start with a hand drawn version on tear sheets and then put it in the computer later so we don’t have the black box syndrome. Since the most valuable part of adding this science to the art of negotiation is that it breaks the psychological link to the number “we like,” I prefer animated outcome curves that move with various adjustments for costs, cognitive errors, etc. They graphically display the difference between possibilities (y-axis) and probabilities (x-axis) without overly focusing on the one net expected value that a decision tree produces.

Don is right that computer-generated decision trees can produce the black box syndrome, and starting with a hand-drawn map is an easy fix. (For those who want more on how to actually use decision trees, see Don’s article in the Harvard Negotiation Law Review styled [The One Minute Manager Prepares for Mediation:  A Multidisciplinary Approach to Negotiation Preparation](http://www.adrtoolbox.com/docs/HNLR_Philbin.pdf).)

### Math Isn’t Enough

In addition to his point about garbage in/garbage out, Los Angeles mediator [Joe Markowitz](http://www.jcmarkowitz.com/p/background-and-experience.html) explored a second decision tree problem on [Mediation’s Place](http://www.mediate-la.com/):

[Another] uncertainty you cannot eliminate is the uncertainty of predicting how people will deal with the choice between the mathematical probabilities of the decision tree analysis and the concrete offer on the table. So if you tell the plaintiff that they have the choice between the defendant’s $50,000 offer and a 30% chance of scoring a million dollar verdict at trial (or you tell the defendant that they can pay the plaintiff $200,000 or face a 10% chance that the plaintiff will get a million dollar judgment), you would think that taking your chances at trial would be the obviously better option in both cases, but a lot of people will take the offer rather than risk getting nothing (or pay the unreasonable demand even if they are very unlikely to lose at trial). Their choice will depend on how much they like to gamble and a lot of other psychological factors that cannot be very easily quantified. Remember how Monty Hall used to offer people the choice between something like $500 in an envelope or a one in three chance of winning a new car? A surprising number of people chose the envelope. . . .

So yes doing the decision tree exercise can be very useful, but mainly to demonstrate to people just how much uncertainty remains in front of them if they want to continue to litigate, and perhaps as a means of making people comfortable with the fairness of the settlement offer. That kind of analysis can’t really give you a precise indication of what a case is “worth,” but it might help some people decide if they want to settle or not.

And even if clients could be persuaded to follow the math, [Michael Webster](http://bizop.ca/) has [commented here previously](http://www.settlementperspectives.com/2009/01/decision-tree-analysis-in-litigation-the-basics/#comments) that decision trees can’t produce a true expected value of a case:

A complex decision tree might help you find outcomes that you had not thought about, but it is highly unlikely that decision analysis is ever going to progress to give you an expected value of a case.

While [Marc Victor](http://www.litigationrisk.com/frame-over.htm) has a [persuasive response](http://www.settlementperspectives.com/2009/07/advanced-decision-tree-analysis-in-litigation-an-interview-with-marc-victor-part-ii/) to this last point, [Philip J. Loree Jr.](http://www.loreelawfirm.com/attorneys_ploreejr.php), who writes at the [Loree Reinsurance and Arbitration Law Forum](http://loreelawfirm.com/blog/), reminds us that “[t]he art here is predicting how the decision maker will analyze the case.”  Phil and Joe are right — standing alone, the expected monetary value at the end of the decision tree doesn’t settle the case.  But a decision tree, and the analysis required to get it done right, can highlight unforeseen contingencies, uncertainties and opportunities in the case.  With a little help from a good neutral, this may help your decisionmaker decide if she wants to settle or not — and that’s plenty to ask for.

### Some Lawyers Aren’t Good at Math

For a final tip, [Phil Loree](http://www.loreelawfirm.com/attorneys_ploreejr.php) implicitly acknowledges what many of us already know — lawyers aren’t always good at math — and proposes a solution:

[I]f you have someone on your team who is an actuary, statistician or mathematician — or simply someone with a solid quantitative background like an engineer or skilled accountant — you might want to enlist that person’s assistance to be sure that at least the quantitative aspects of the analysis are on the mark.

We always get smart, practical advice from Phil.

Try some of the tips above to make your next decision tree more effective.  You’ll be glad you did.