

University of Cincinnati College of Law

## **Advanced Decision Analysis**

Fall Semester, 2007

Room 302

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### **Syllabus and In-Class Agendas**

#### **Required Software/Text:**

TreeAge decision analysis software is available for downloading at [www.treeage.com](http://www.treeage.com). The TreeAge ProSuite Excel, student version, one year license, with 125 node limit, priced at \$40, is sufficient for this course. When you e-correspond with the folks at TreeAge, please indicate that you are taking the course at the University of Cincinnati College of Law.

You should bring your laptop, loaded with the software, to all class sessions.

Note that the software itself, *including* the downloadable user's manual (which is really excellent as a substantive piece) are considered to be the required text in this course.

In addition, you will be asked to read simulation case handouts (for decision analysis) provided in class, and selected articles referenced in the assignment section below. I will make every effort to have these available for download in pdf format.

#### **Optional Pre-Course 2L Lawyering Decision Analysis Review Session**

The course note promised a pre-course review session for students who wanted to brush up on the basics presented in 2L Lawyering. I like to keep promises. Thus, I will hold an entirely optional review session on Friday, August 24, in Room 208 from 12:30 – 1:30. After presenting the basic logic, a typical decision tree structure and how a “roll back” occurs, I will answer any questions. If students will find it helpful, I will then work through the decision tree in Hapless Harvest (which students handed in at the individual counseling skills session). I plan to review using some of the ppts, etc from the 2L Lawyering decision analysis module. I will have these posted on the website with the course syllabus, along with the two articles on decision analysis, assigned as part of 2L Lawyering.

**Assignments: In preparation for Class One –Monday, August 27, 2007**

**Download, Read, Play:** Download the TreeAge software from TreeAge.com. Review chapters 1, 2, 5 (through the material on rollback, page 59), and 9 (which is largely mechanical). Play with constructing a basic decision tree. I suggest working through the basic tutorial, if you are having trouble creating a tree with the pull down menus. You need not read Chapter 3 on Influence Diagrams. We will tackle these on soon enough.

Note: I don’t plan to “assign” every page of the User’s manual. For this week, I have specifically assigned the basic chapter on building decision trees and software functions necessary to work with the program. From time to time, you will find it necessary to consult the User’s manual for specific software instructions.

If you don’t come to the review session, then clear those mental cobwebs and brush up on your notes from the 2L Lawyering sessions on Decision Analysis. The course TWEN site includes powerpoints from those sessions, as well as the readings:

Aaron and Hoffer, “Decision Analysis as a Method of Evaluating the Trial Alternative,” Chapters 11 in Golann, *Mediating Legal Disputes* (Boston: Aspen, 1996) 307-334.

Aaron, M. “Finding Settlement with Numbers, Maps and Trees, “ Chapter 13 in Moffitt, M. and Bordone, R. eds, *The Handbook of Dispute Resolution* (Jossey Bass, 2005).

(These are NOT required readings, but are posted as resources for review.)

**Think of a case or other problem for decision analysis.** Select a relatively simple case or legal problem on which you have worked, one that you are familiar with from colleagues, classmates or the news, or a case you find from a random walk through a book of state or federal decisions that would be suitable for decision analysis, or at least analysis of the uncertainties as they may have appeared to one side or another. Write no more than a sentence or two describing the case or problem. We will NOT begin working on these in class, but we will have a little bit of time to review them in small groups. The assignment for September 10 will be to provide a more detailed set of facts and issues for analysis. I ask that you bring a basic, preliminary idea on August 27, so that we can determine whether it’s likely to be workable, what additional information would be most important, etc.

**Topical Agenda for Class One – Monday, August 27, 4:45 – 7:45 p.m.**

- Course overview: aspirations, methods, options, and practicalities
- The case for deconstructing decision making
- Play the *Sue or Settle* Game – with real fake dollars.
- Debriefing discussion of decision analysis and client issues in *Sue or Settle*
- Small group review of students’ cases for future decision analysis work: What information will be essential, what questions should be asked?

**In preparation for Class Session Two – Friday, September 10, 2006, 4:45 – 9:15 p.m.**

**Read:** M. Victor, *Interpreting a Decision Tree Analysis of A Lawsuit*, on the TWEN site. (This article should be largely review. It is short and to the point. If it all seems easy and obvious, a quick skim is fine.)

Chapter 5, pp. 59-70 of TreeAge Pro User's Manual.

**Write:** a page or (or two or three) description of a case or legal problem suitable for decision analysis. Include information that would be helpful for creating the structure of a tree for the case. Come to class having thought about any additional, contextual information that might be relevant. **Please bring at LEAST 12 hard copies of this case write up with you. (If you forget to do this, you may have to run out and make copies during break.)**

**NOTE THAT I HAVE NOT ASSIGNED A LOT OF ADDITIONAL READING FOR THIS WEEK. I AM VERY MUCH LOOKING FOR THOUGHTFUL CASE DESCRIPTIONS.**

**Word to the wise:** Don't make this problem too easy! Yes, a more complicated problem will require more prep and more head scratching when you try to draw a tree. But this exercise will NOT be graded, and you will have adequate time to work on it in class, with a partner at first, and then with your classmates. The harder the problem, the more mistakes and mental stumbling blocks worked out in class with no grade risk. That will make it MUCH easier to create dazzling trees later on.

**Try to construct, using the TreeAge software:**

- A decision tree for *Sue or Settle*, if not completed in class. DO try to use the software's capacity to build in variables and formulas so that your tree would easily and efficiently reflect changes in probabilities and payoffs as the game progresses.

**At least two hours before class, please email me your Sue or Settle tree, or bring in 12 hard copies. (Because we'll be in the smart classroom, if you email your tree to me I should be able to display it in class. Not all trees will be displayed in class – but those of interest for class discussion will be displayed or distributed.)**

Remember to bring both trees and the case description to class ON YOUR LAPTOPS.

DO NOT SPEND MORE THAN 45 minutes on the Sue or Settle tree. Just bring to class whatever you can finish within that time.

**Topical Agenda for Class Two – Monday, September 10, 2006, 4:45 – 9:15 p.m.**

**When is a tree accurate, elegant and useful? What do you need to build one?**

**Construction Challenges in Building Trees: What's the problem? What's not coming naturally?**

- Clinical review of students' (and professor's) Sue or Settle Trees, focusing on structure and built in variability for probability and outcomes.
- In class problem solving and building trees in student cases.

- Neither yellow pads nor tech software can make judgments – lawyer must! Finding judgment and nuance in construct and design of optimal trees for real cases. Advice for insuring the decision analytic process has meaning and value for your clients.
- Talking (teaching) is the test: practice explaining the method and the tree to your client. What are helpful phrasings? What words yield unintended consequences? Influence diagrams/issue mapping for complex cases
- On the off-chance time permits: Introducing influence diagrams/dependency mapping.

**Assignments: In preparation for Class Three – Monday, September 17, 2007**

**Read:**

John Hammond, Ralph Keeney, Howard Raiffa, Smart Choices. (New York: Broadway Books, 1999), Chapter 1, pp. 1-14. On course TWEN site in pdf format.

Excerpts from Robert T. Clemen, *Making Hard Decisions: An Introduction to Decision Analysis*, 2d Ed. (Duxbury Press, 1996): Chapter 1, “Introduction to Decision Analysis,” pp. 1-9, and Chapter 2, “Elements of Decision Problems” pp. 19-28 and pp. 31-34, PLUS questions and problems 2.1, 2.2, 2.6, 2.8. **(Be prepared to discuss your responses in class!)** On course TWEN site in pdf.

“An Influence Diagram Tutorial,” Chapter 3. pp. 27-39, Chapter 23, “Bayes’ Revision in Decision Trees,” Chapter 23, and “Building Influence Diagrams, Chapter 25, pp. 329-339, in TreeAge Pro User’s Manual.

Marc B. Victor, Craig B. Blidden, Clyde W. Lea, and J. Bryan Witworth, “Evaluating Legal Risks and Costs With Decision Tree Analysis,” Chapter 12 of Successful Partnering Between Inside and Outside Counsel (Robert L. Haig ed.) West Group & ACCA 2000). Selected portions reprinted with permission of West. **YOU NEED ONLY READ THOUGH PAGES 1- 6 and 17-19 FOR THIS WEEK!** Full article on course TWEN site in pdf.

Excerpts from Chapter 3, in Robert T. Clemen, *Making Hard Decisions: An Introduction to Decision Analysis*, 2d Ed. (Duxbury Press, 1996) “Structuring Decisions” pp. 50 – 63. On course TWEN site, in PDF format.

Excerpts from chapter 7 in Robert T. Clemen, *Making Hard Decisions: An Introduction to Decision Analysis*, 2d Ed. (Duxbury Press, 1996): “Oil Wildcatting,” “John Hinckley’s Trial,” and “Decision Analysis Software and Bayes’ Theorem,” pp.242 – 250. I recommend starting with 248 – 250 and then going back to 242-248.). On course TWEN site in pdf format.

**THINK THROUGH YOUR ANSWERS to problems 2.1, 2.2, 2.6, 2.8 from Clemens, referenced above. We will discuss them in class.**

**Topical Agenda for Class Three – Monday, September 17, 2007 4:45 -7:45 p.m.**

Back to basics and Perspective – Decision-Making and Influence Writ Large & Deep Before, Under, and Over Legal Uncertainty: Considering and Structuring Decisions From Life and Politics to Nitty Gritty Problems: Influence Mapping; What about Imperfect Information

- Deconstructing a few of life's big and small questions – redux
- Influence Diagrams/Dependency Mapping – WE'LL TRY IT on a “real fake case”
- When predictably imperfect predictions matter - Bayes' Theorem (time permitting)

**Assignments: In preparation for Class Session Four –Monday, September 24, 2007**

If not completed in class, finish influence map for case handout.

Read: TreeAge ProUser's Manual, Chapter 12 -15, and Chapter 17 pp. 224 and 225. You don't have to be able to do all of the fancy stuff, but you should have a sense of the methods and logic of sensitivity analysis and fractile distributions.

Excerpts from chapter 8 in Robert T. Clemen, *Making Hard Decisions: An Introduction to Decision Analysis*, 2d Ed. (Duxbury Press, 1996): “Assessing Discrete Probabilities,” pp. 267-285, “Pitfalls: Heuristics and Biases,” pp. 281-285, “Decomposition and Probability Assessment,” 285-288 and “Coherence and the Dutch Book,” pp. 296-298, and problems 8.7 and 8.8 on page 300. (Excerpts and problems are on the course TWEN site in pdf format.) (You are welcome to skim through the mathematical formulae and overly technical diagrams. Just think about the concepts.)

Marc B. Victor, Craig B. Blidden, Clyde W. Lea, and J. Bryan Whitworth, “Evaluating Legal Risks and Costs With Decision Tree Analysis,” Chapter 12 of Successful Partnering Between Inside and Outside Counsel (Robert L. Haig ed.) West Group & ACCA 2000). Selected portions reprinted with permission of West. THIS TIME READ pages 7 –11. You are welcome to read through the article! On course TWEN site in pdf.

Depending upon progress, there may be a simulation for review before next week's class.

**Topical Agenda for Class Four – Monday, September 24, 2007, 4:45 – 9:15 p.m.**

***“Expert consultant” sounds so much better than “junior lawyer”!***

- What if it's NOT your case? What questions would an expert consultant ask of the Muckety Muck Partner to create a decision analysis? Prof as Muckety Muck Partner, students as experts. What strategies can the consultants use to elicit useful information and “accurate” probability assessments?

**Straight teaching interlude in probability, damages, and time:**

- Working around probable psychology for working with probability estimates.
- Setting damages ranges – mathematicians' bones, the non-calculists's curves and integrity at terminal branches, nodes and payoffs.
- Factoring in the factor of time.
- In-class problem sets and discussion to solidify concepts and test applications.

**Topical Agenda for Class Five – Monday, October 1, 2007, 4:45 – 7:45 p.m.**

- Guest lecturer – Patrick D. Lane, Esq. Legal Department, Procter & Gamble.
- Strategic applications, for resource allocation, strategy, negotiating with the internal and external clients and with the other side!
- Practical Application – P&G problems. Practice exercise and debriefing.

**Assignments: In preparation for Class Session Six – Monday, October 8, 2007**

Read: TreeAge Pro User's Manual, Chapter 24 (pages 302-307 on risk and utility) and Chapter 16.

Howard Raiffa, *Decision Analysis: Introductory Lectures on Choices Under Uncertainty* (Reading, MA: Addison-Wesley Publishing Company, 1968), pp. 51-57. [This piece looks a bit technical, but don't worry. I have assigned it so that we can say you've read some of this historically significant book. The next reading, co-authored by Professor Raiffa many years later, takes you through utility and risk with much less mathematical jargon.] On TWEN site in pdf format.

John S. Hammond, Ralph L. Keeney, and Howard Raiffa, *Smart Choices: A Practical Guide to Making Better Life Decisions* (New York: Broadway Books, 2002, originally published in hardcover Harvard Business School Press in 1999) pp. 131-158. On TWEN site in pdf format.

Possibly, a case problem to be distributed in class.

**Topical Agenda – Class Six - Monday, Oct. 8, 2007, 4:45 – 9:15 p.m.**

- Utility and dollars – not always the same thing; deriving utility through dialog, grids and plots.
- The risk factor –working with the risk averse or risk seeking client; deriving the utility of risk, adjusting payoffs or not.
- The usefulness (dare I say utility?) of outcome distributions, positive and negative ranges.
- Application in a transactional or policy (non litigation) setting

**Preparation for Class Seven – Monday October 22, 2007**

Excerpt from Robert T. Clemen, *Making Hard Decisions: An Introduction to Decision Analysis*, 2d Ed. (Duxbury Press, 1996), “Time Value of Money, “ pp 28-31 (especially pages 28-29). On TWEN site in pdf format.

Marc B. Victor, “Litigation Risk Analysis and ADR,” in *Donovan Leisure Newton & Irvine ADR Practice Book* (John H. Wilkinson, Editor) (Wiley Law Publications, John Wiley & Sons, Inc. 1990). (Available in pdf format with the syllabus.)

This article is a review of many of the concepts covered to date and worth reading for that reason. For the purposes of this class, you should focus on the probability distribution material on pages 13 and 18, and on the discussion of using the methodology as a means of persuasion.

**Topical Agenda: Seventh and Final Class – Monday October 22 (?) 4:45 – 7:45 p.m.**

- Fancy Footwork on the Software – Formulas and Tornadoes...
- Soup to Nuts: deciding to build the tree, building the branches, reaching the end of the limb(s) and bringing the client with you.

**Final written work deadline**

*Friday, November 16, 2007 – Final decision analysis and report due.*

*ALL STUDENTS WILL COMPLETE A FINAL DECISION ANALYSIS PROJECT IN THE FORM OF A REPORT TO A CLIENT OR A PARTNER, PRESENTING AND DISCUSSING A DECISION TREE ANALYSIS FOR A PARTICULAR CASE OR PROBLEM. A MORE DETAILED DESCRIPTION OF THE ASSIGNMENT IS AVAILABLE AT THE TWEN SITE. STUDENTS ARE ENCOURAGED TO SELECT A CASE OR PROBLEM OF PROFESSIONAL INTEREST, WHICH MAY BE A REAL CASE IN YOUR PART-TIME OR SUMMER JOB. YOU MUST WRITE UP YOUR PROPOSED CASE OR PROBLEM TOPIC AND GIVE IT TO ME FOR APPROVAL, PREFERABLY PRIOR TO NOVEMBER 2.*

*IF STUDENTS CANNOT OR PREFER NOT TO WORK ON A REAL CASE, THEY ARE WELCOME TO USE THE BIO-CON MICROTEX CASE (FAMILIAR TO THOSE WHO HAVE TAKEN MY NEGOTIATION COURSE. ) I WILL PROVIDE YOU WITH HARD COPIES OF THE CASE MATERIALS, BUT I DO NOT WANT TO PUT IT ON THE TWEN SITE, AS THIS YEAR'S NEGOTIATION STUDENTS MIGHT BE TOO EAGER TO SEE IT.*