Nathan Green

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What is TreeAge?

- From https://www.treeage.com/about-us/

For over 20 years, TreeAge Software, Inc. has been the global leader in the development of decision analysis software. TreeAge Software is a privately held company headquartered in Williamstown, Massachusetts.

TreeAge Pro is the leading visual tool for creating and analyzing decision trees. Create decision trees of unlimited complexity for any type of decision. The finished model can then be analyzed to choose the optimal strategy as well as measure the effect of uncertainty on that strategy selection.

TreeAge Pro

- TreeAge Pro is a common visual development tool used in HTA
- Formerly named DATA Pro
- With Microsoft Excel, it is the most popular software for health economics analyses
- Strengths
  - Ease of model implementation.
  - Possible to define a model visually using influence or state transition diagrams, and then covert these diagrams to decision trees or Markov models
  - Markov models can be converted to DCE models
  - The visual interface supports copy and paste operations for all or parts of models as well as cloning sub-trees
  - Support interfaces with a variety of software packages, including Excel, and automates the production of a diverse array of outputs

General pros & cons

- Transparency
  - Being a pre-programmed package there is no coding to review
  - Some find large models and/or equations can be unwieldy
- Runtime
  - Potentially slow e.g. large models, PSA
- Ease of use
  - Good documentation and videos
  - Easy to set up models interactively

Decision Trees

- Build models to study simple and complex problems to choose the best possible outcome
- Visual editor makes it easy to build and present models
- Used in the industries of healthcare, oil/gas exploration, business and finance

Advanced Modeling Features

- Use sophisticated modeling techniques for complex decision
- TreeAge Pro supports
  - Markov models
  - patient-level simulation (Microsimulation) models
  - time-to-event (DES) models using a consistent set of modeling and analysis tools

Analysis Tools

- Apply sophisticated analysis and reporting tools to your model, including
  - decision analysis
  - cost-effectiveness analysis
  - sensitivity analysis
  - Monte Carlo simulation and more

PACEOMICS Working Paper

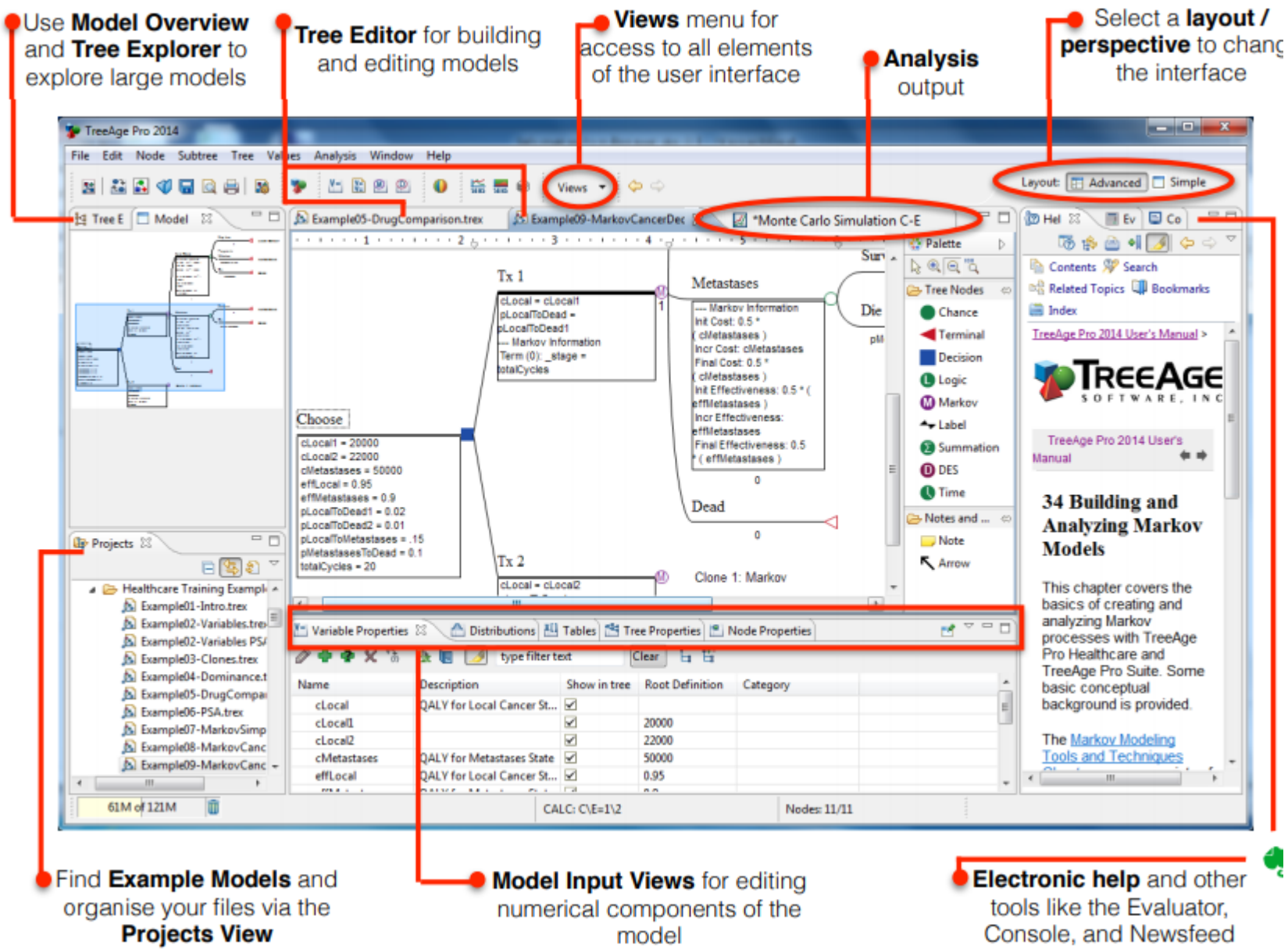
Table 4: Summary of TREEAGE Pro software capabilities

Models Explicitly Supported	Analysis & Outputs	Interoperability
Budget Impact Analysis (Dynamic Cohorts)	Bayesian Revision	Excel
Decision Trees	CE plane/scatter plots	Java & ActiveX API
DES (Time to event)	CEAC	ODBC database connections
Markov Models	Deterministic & probabilistic sensitivity analysis	Python
Micro-simulation (Individual State Transition Models)	EVPI	
	EVPPI	
	ICERs & Dominance	**Scalability**
	Markov Trace	Distributed computing
	Survival curves	Multi-threaded
	Threshold analysis	
	Tornado diagrams	
	Various charts (NMB v. WTP, EVPI v. WTP &c.)	
	Various distributions (ICERs, stochastic parameters, &c.)	

Deterministic Sensitivity Analysis for First-Order Monte Carlo Simulations: A Technical Note Benjamin P. Geisler, MD et all (2009) Value in Health

- From version 2007, TreeAge ProTM also includes an object or "scripting" interface which provides access from other programs
- TreeAge Pro Suite/Excel installs an "add-in" to Excel that adds TreeAge ProTM objects to be accessed by Excel
- An object interface enables automating of tasks that are common, repetitive, and time consuming e.g.
  - (Re)setting a tree's variables from outside TreeAge ProTM
  - Automatically running a set of analyses
  - Automatically exporting results

The GUI


Use **Model Overview** and **Tree Explorer** to explore large models
Tree Editor for building and editing models
Views menu for access to all elements of the user interface
Analysis output
Select a **layout / perspective** to chang the interface
TreeAge Pro 2014
File Edit Node Subtree Tree Values Analysis Window Help
Views
Layout: Advanced Simple
Tree E Model
Example05-DrugComparison.trex
Example09-MarkovCancerDec
*Monte Carlo Simulation C-E
Palette
Tree Nodes
Chance
Terminal
Decision
Logic
Markov
Label
Summation
DES
Time
Notes and ...
Note
Arrow
Tx 1
Metastases
Dead
Choose
Tx 2
Clone 1: Markov
Projects
Healthcare Training Example
Example01-Intro.trex
Example02-Variables.trex
Example02-Variables PSA
Example03-Clones.trex
Example04-Dominance.t
Example05-DrugCompa
Example06-PSA.trex
Example07-MarkovSimp
Example08-MarkovCanc
Example09-MarkovCanc
Variable Properties
Distributions
Tables
Tree Properties
Node Properties
type filter text
Clear
Name
Description
Show in tree
Root Definition
Category
cLocal
QALY for Local Cancer St...
cLocal1
20000
cLocal2
22000
cMetastases
QALY for Metastases State
50000
effLocal
QALY for Local Cancer St...
0.95
61M of 121M
CALC: C\E=1\2
Nodes: 11/11
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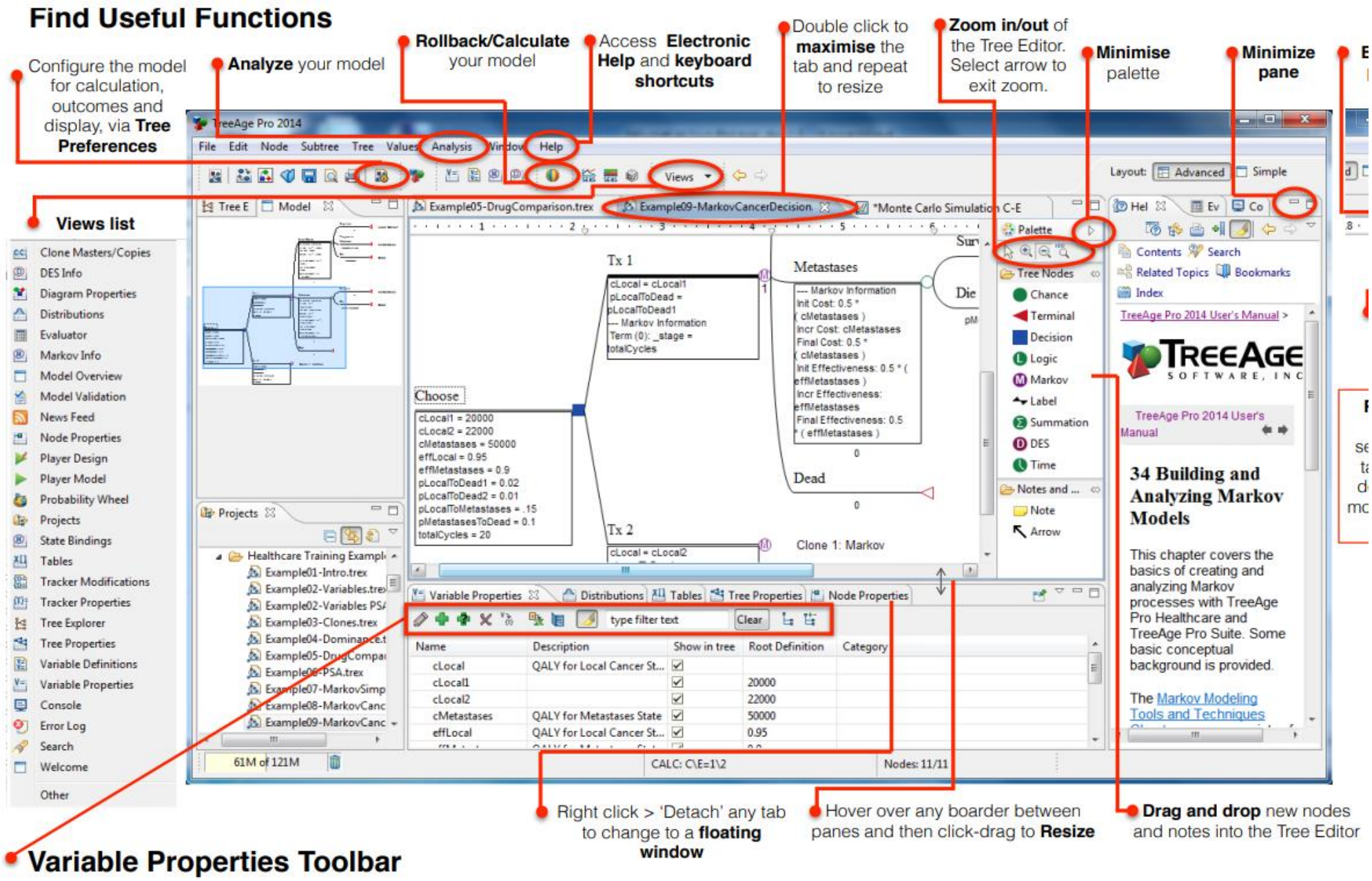
TreeAge Pro 2014 User's Manual >
TreeAge Pro 2014 User's Manual
34 Building and Analyzing Markov Models
This chapter covers the basics of creating and analyzing Markov processes with TreeAge Pro Healthcare and TreeAge Pro Suite. Some basic conceptual background is provided.
The Markov Modeling Tools and Techniques
Find **Example Models** and organise your files via the **Projects View**
Model Input Views for editing numerical components of the model
Electronic help and other tools like the Evaluator, Console, and Newsfeed

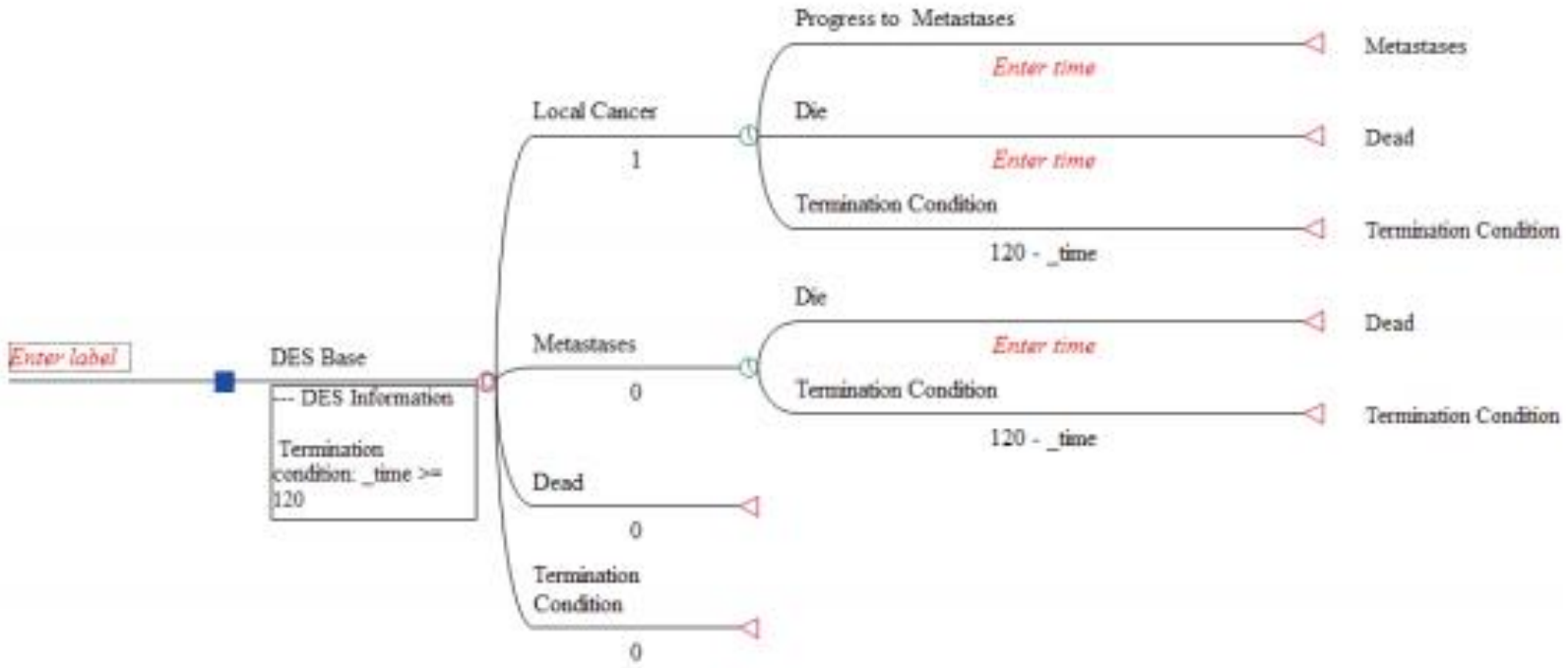
Find Useful Functions

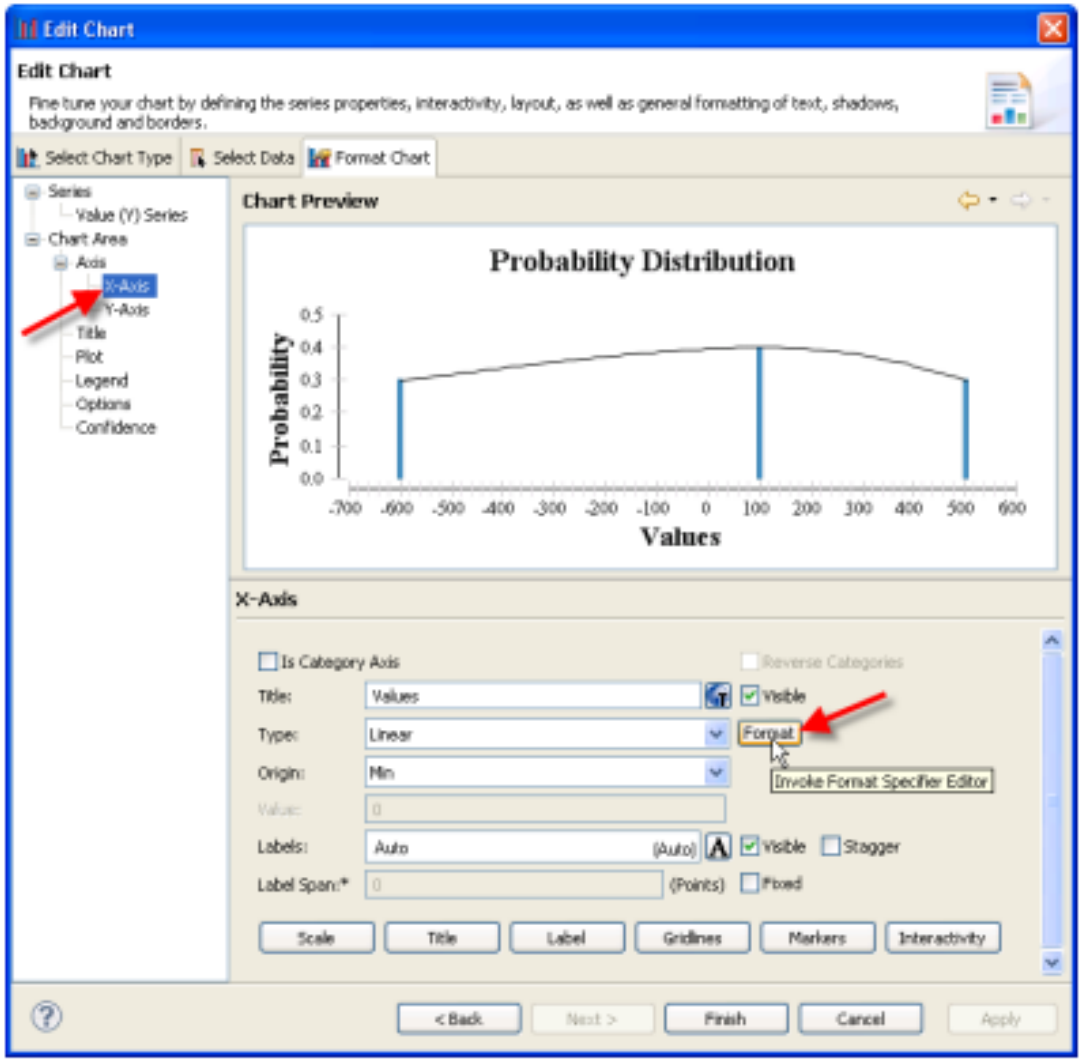


Plotting

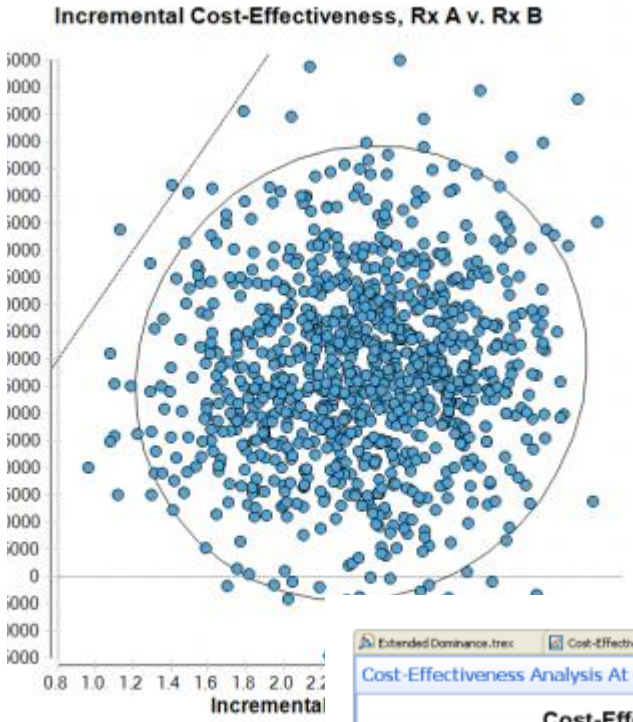
- Preinstalled features for economic evaluations could be used
  - E.g. the calculation of ICERs or net benefits
- Common plots drawn at a click, which makes presentation of the modelling results comfortable and time efficient
- Beginning with TreeAge Pro 2011, both charts and text reports are generated and displayed using the Business Intelligence and Reporting Tools (BIRT) Eclipse Project. BIRT technology provides highly customizable reporting capabilities for Eclipse-based applications

Decision tree

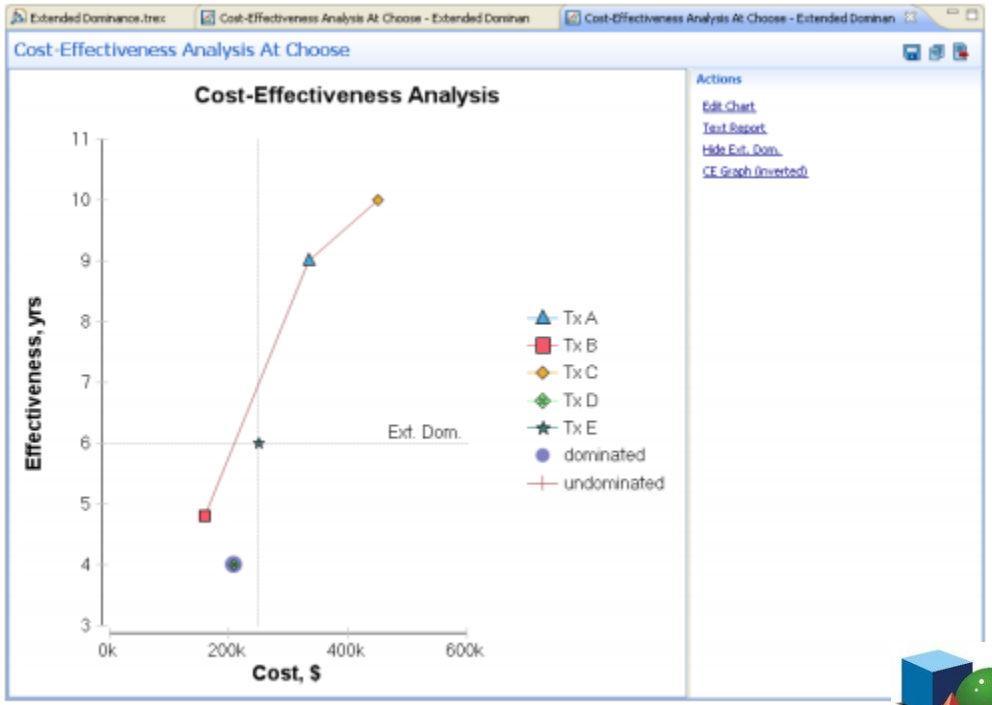




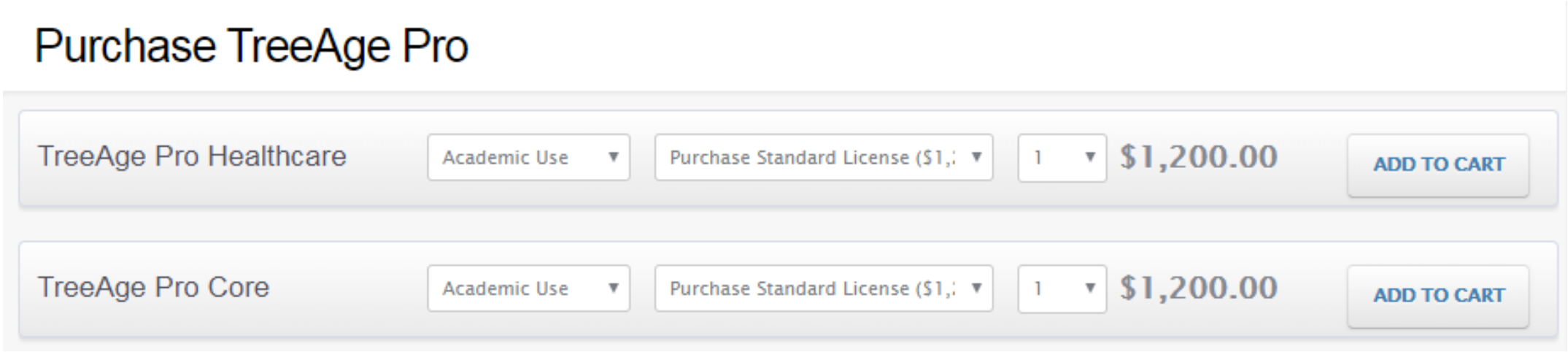
Edit Chart Dialog - Format axis



atterplot



Cost



- Need to renew annually the license (for annual licenses) or the maintenance (for the standard perpetual license), which, in the medium to long term, results in an amount that may seem excessive.
- Offers several licenses depending upon industry and use.
- Markov and micro-simulation models requires the Healthcare version as does using the cost-effectiveness, Markov cohort, and healthcare reporting features
- State-transition diagrams, DES, distributed processing, and creation of player models all require both the Healthcare module as well as an active maintenance license

Conclusions

- TreeAge is a great piece of software for decision analysis
- TreeAge seems to strikes a good balance between ease of implementation and flexibility
- It is expensive
  - Especially pertinent for LMICs