HIGH-PERFORMANCE PREDICTIVE ANALYTICS – USING ADVANCED MODELING TECHNIQUES

Translating data into business value requires the right data mining and modeling techniques which uncover important patterns within a dataset, identify good predictors, and produce accurate and stable predictions. Advanced predictive modeling can help companies understand customers, predict their behaviour, drive strategic decision making and ultimately improve business performance.

In order to get started with predictive analysis via modeling techniques, users must first identify the business problem. Some of the most common business applications in which predictive modeling techniques play a crucial role are risk, fraud detection, marketing, and sales. In these, business problems can range from creating the best cross-sell or upsell offer that resonates with a particular audience to identifying fraudulent activity and being able to assess which customers are most likely to default.

So how do businesses apply the right models and build effective strategies to solve a perceived business problem?

## Advanced Modeling Application
**Designed to Address Business Challenges**

- Predictive analytics applications are complex and have a long learning curve
- Many analytics applications require statistical programming skills
- Expensive training and consulting is often required with predictive analytics software
- Many predictive applications lack scorecard building capabilities
- Decision Trees used in most predictive analytics applications lack interactivity and rich graphical interface
- Analytics software products on the market are expensive and do not provide value for money spent
- Traditional BI and reporting tools cannot provide predictive insights to improve business decisions
- Most predictive models are not easy to explain to business stakeholders
- Lack of integration and model deployment options for data exchange and exporting models to other environments
- Lack of streamlined way to use model predictions for building strategies in a single application results in lower productivity
Widely known for its **industry-leading, patented Decision Trees, Strategy Trees, and its workflow and wizard-driven graphical user interface**, KnowledgeSTUDIO is an advanced data mining and predictive analytics workbench for high-performance business analysts and quantitative analysts. The application provides a robust set of capabilities for model development and deployment for a wide range of applications and use cases.

With **advanced predictive modeling capabilities**, KnowledgeSTUDIO offers comprehensive and advanced predictive analytics for all phases of the data mining cycle with focus on model development and deployment cycle.

The high-performance visual environment provides users with an intuitive workflow and wizard-driven graphical user interface which helps users build effective models without having to code.

Quantitative analysts have access to more complex functionality with configurable settings for fine tuning advanced model parameters in order to accommodate models of any complexity.

“We Angoss Strategy Trees are great... much better than having to learn code”

---

**KnowledgeSTUDIO Features**

- No programming skills required for building advanced models – Just use the GUI!
- Advanced modeling techniques: linear and logistic regression, scorecards, neural networks, cluster analysis, market basket analysis, and factor analysis
- Best-in-Class Decision Trees for segmentation analysis and modeling
- Ensemble Trees built with Bagging, Boosting, and Random Forest algorithms
- Unique Strategy Trees for prescriptive analytics
- Weight of Evidence Optimizer automatically optimizes bins for WOE variables with the click of a button – 50% time savings!
- Segment Viewer for the identification of candidate predictive attributes
- Data Preparation and Profiling for easy extraction, manipulation and transformation of data for modeling
- Easy-to-Use GUI with a powerful automated workflow canvas
KnowledgeSTUDIO™ is unique in its universality and efficiency. It is used by customers across a multitude of industries and departments such as credit risk, fraud, marketing, sales, and CRM analytics. The easy-to-use application with an automated canvas for building, displaying, refreshing and reusing analytic workflows drastically increases data mining efficiency by more than 40%.

**KnowledgeSTUDIO Differentiators**

- **The easy-to-use graphical user interface with automated workflow** is rated to be one of the best in its category by industry analysts and users. Point-and-click, workflow and wizard-driven interface is fast and easy to learn. The powerful automated canvas for building, displaying, refreshing, and reusing analytic workflow enables the creation of a workflow in minutes with a few simple drag-and-drop steps – eliminating the need to write code thereby increasing efficiency.

- **Segment Viewer** can be used as a qualitative assessment tool to identify candidate predictor variables for use in modeling. It displays the distribution charts of the independent variables segmented by the categories of the dependent (target) variable. This allows for easy identification of variables with markedly different distributions across the target categories.

**Scorecard Building Highlights**

- Workflow automation of the entire scorecard building process
- Scorecards are built on the basis of logistic regression models
- Automated generation of Weight of Evidence (WOE) variables using decision tree interface and advanced WOE binning optimization algorithms
- Reject Inference methods for improving the accuracy of application scorecards, including: proportional, hard cut-off, parceling, and fuzzy augmentation
• **Advanced predictive modeling techniques**
  including advanced scorecard development, linear and logistic regression, decision trees, ensemble trees, neural networks, and unsupervised learning techniques such as market basket analysis, cluster analysis, and factor analysis.

• **Scorecard building capabilities**, offered in KnowledgeSTUDIO, automate the traditionally tedious, manual task of coarse classing (binning) with a flexible and intelligent Weight of Evidence Optimizer (WOE) – reducing time spent on this task by up to 50%. The WOE binning editor uses the decision tree interface and specialized optimization algorithms that are unique to Angoss. **Reject inference methods** for scorecard development include: Proportional Assignment, Hard Cutoff, Parceling, and Fuzzy Augmentation (See Scorecard building highlights call-out box pg. 3 & 4)

• **Best-in-Class Decision Trees** outperform the competition, allow interactive automatic and manual growth and visually display results for easy interpretation.

---

**Scorecard Building Highlights Continued**

• Scorecard scaling is performed through an easy-to-use wizard that includes the option of incorporating Base Score into Score points

• Population Stability Report for measuring and monitoring the scorecard performance statistics

• Auto-adjustment of boundaries of Weight of Evidence bins while training the logistic regression model

• SAS and SQL code generation for entire workflow or any segment

• Scorecards can be scored on Angoss datasets or exported to SAS, SQL or PMML code

• Scorecard performance can be assessed using Model Analyzer

• Scorecards are generated in standard tabular form that can be exported to Microsoft Office applications and in the form of a SQL expression
• **Unique Strategy Trees** are the first of its kind for building and deploying prescriptive strategies. Users are able to combine customer segments, scores, business rules, and calculations, and apply user-defined treatments and actions in order to support decisioning and the development of business strategies.

• **Model Analyzer** provides an extensive set of model validation and comparison features as well as model deployment tools. Model performance can be evaluated and compared using lift and cumulative lift charts, relative operating characteristic curves and other charts. This feature allows users to provide management with estimated response rates and lift for each individual model.

The integration of Tableau visual analytics further enhances Angoss’ visualization capability by providing users with access to Tableau dashboards directly from within the Angoss workflow.

• **Automatic SAS code generation** for the entire project workflow or any of its stages.

• **Easy integration** into other analytical environments enables data import and export to/from Text, Microsoft Excel, SAS, SPSS, R, Hadoop, and databases via ODBC. Automatic code generation for Angoss models can be deployed in other rules engines and environments. Code types include SQL, SAS, SPSS, Java, PMML, XML, and structured English code.

KnowledgeSTUDIO is the most robust and easy-to-use tool designed to help advanced quantitative analysts and business analysts to explore and segment data, develop, and deploy models and strategies in varied business and application areas.

KnowledgeSTUDIO is a scalable application that grows with your organizational needs and provides users with the flexibility for added functionality such as:

• Improve collaboration between users and...
departments, with the integration of the languages of R and Python, all within a single environment. To enhance the user experience, the programming languages can be directly embedded in the Angoss workflows.

- **In-Database analytics** for direct data mining on data stored in a database as opposed to working on a copy of the data.

- **Real-time scoring** engine delivers intelligent, real-time scores or recommendations to operational systems during customer interactions to support timely decision making and speed-to-action.

- Advanced data prep functionality in the language of SAS via **KnowledgeCORE™** integration. Users can write programs in the language of SAS, SQL, Python and R and use custom programs and pre-built functional nodes within Angoss analytic workflows.

- Model management capability via **KnowledgeMANAGER™** for modelers looking to store, compare, monitor, and score models to ensure that only the best models are put into production.

- Optimization capability via **InsightOPTIMIZER™**, enables organizations to optimize their sophisticated predictive models, subject to business constraints and rules, in order to minimize loss and maximize profits.

---

**About Angoss**

Angoss is a global leader in delivering predictive analytics to businesses looking to improve performance across risk, marketing and sales. With a suite of big data analytics software solutions and consulting services, Angoss delivers powerful approaches that provide you with a competitive advantage by turning your information into actionable business decisions.

Many of the world’s leading organizations in financial services, insurance, retail and high tech rely on Angoss to grow revenue, increase sales productivity and improve marketing effectiveness while reducing risk and cost. Headquartered in Toronto, Canada, with offices in the United States, United Kingdom and Singapore, Angoss serves customers in over 30 countries worldwide. For more information, visit www.angoss.com.