



SMARTVISION



# SV Analytica Modeler

*Discover patterns in historical data to predict future events, make better decisions and achieve better outcomes*

# Overview

**In a business environment**, the main objective of analytics is to improve a business outcome.

These outcomes can include:

- Increasing revenue by reducing customer attrition
- Increasing cross sell rates with a call center
- Decreasing costs by identifying fraudulent claims before payment
- Servicing a component in a production line to minimize downtime



Data mining is the process of uncovering patterns in data with analytical techniques. Descriptive analysis, predictive modeling, text analytics, entity analytics, decision management and optimization are used to identify patterns and deploy predictive models into operational systems. Systems and people can use these patterns and models to derive insights that enable them to consistently make the right decision at the point of impact. Outcomes are maximized based on the predictive intelligence hidden in data of growing size and complexity

*When you apply analytics to improve a decision, the result is likely to be a better outcome.*

## **SV Analytica Modeler**

Is a powerful predictive analytics platform that is designed to bring predictive intelligence to decisions made by individuals, groups, systems and your enterprise. SV Analytica Modeler scales from desktop deployments to integration with operational systems to provide you with a range of advanced algorithms and techniques. Applying these techniques to decisions can result in rapid ROI and can enable organizations to proactively and repeatedly reduce costs while increasing productivity.



Accommodate your  
needs with flexible  
deployment



Access all  
Types of Data



With **SV**  
**Analytica**  
**Modeler you can..**



Broaden your  
Analytics Reach

# Accessing all Types of Data

Data is being generated at an exponential rate from a multitude of sources, thereby fueling new information and untapped opportunities for those organizations able to harness it and realize its value.

This data is stored in various systems and formats so bringing it together can be a challenge. The volume of data is so big that you cannot analyze it manually nor can you look over tables in reports to find why something might or might not happen. The analysis process presents yet another challenge because of a scarcity of skilled analysts that can work with the data to extract its value.



## With SV Analytica Modeler...

You and your organization can use the data you have available and extract value from it by discovering untapped opportunities and new information. With new insights from your data, you can predict what is likely to happen, become proactive and optimize outcomes, rather than reacting simply as your current situation dictates.

## SV Analytica Modeler...

Enables you to use a variety of analytical techniques to access data sources, such as data warehouses, databases, Hadoop distributions or flat files, to find hidden patterns in your data. These statistical techniques use historical data to make predictions about current conditions or future events. Also included are capabilities for data access, data preparation, data modeling and interactive visualizations. With automated procedures for preparation and modeling, it is suitable for a wide range of analytics abilities.

# Broaden your Analytics Reach

**With a range of sophisticated techniques analytical** techniques are continuing to evolve, providing analysts with a plethora of options for tackling the problems in front of them. Additionally, as technology develops and new types of data become available (such as location-based data from mobile phones or cell towers), different questions and challenges arise about the best ways to exploit this data. Innovative techniques are therefore necessary.



## With a single platform

Your analysts can solve their business problems with a single platform that is designed to handle simple descriptive analysis, the most complex optimization problems — and everything in between. SV Analytica Modeler features capabilities that go beyond the standard analytic requirements of today's analysts. A range of models, automated modeling and data preparation, text analytics, entity analytic and social network analysis help you address the most sophisticated problems.

# A range of models, SV Analytica Modeler offers an array of modeling techniques, including all of the following algorithms:

**Classification algorithms** makes predictions or forecasts based on historical data with techniques. Examples include decision trees, neural networks, logistic regression, support vector machines, Cox regression, generalized linear mixed models (GLMM) and more. Use automatic classification modeling for both binary and numeric outcomes to streamline model creation or Self-Learning Response Modeling (SLRM) to build a model that you can continually update or re-estimate without having to rebuild the model.



**Segmentation algorithms.** Group people or detect unusual patterns with automatic clustering, anomaly detection and clustering neural network techniques. Use automatic classification to apply multiple algorithms with a single step and take the guesswork out of selecting the right technique.

**Association algorithms.** Discover associations, links or sequences with Apriori, CARMA and sequential association.

**Time series and forecasting.** Generate forecasts for one or more series over time with statistical modeling techniques.

**Extendibility with R programming language.** Apply transformations, use scripts to analyze, summarize or produce text and graphical output with R. With the Custom Dialog Builder, you can share and reuse R code with those who choose not to use programming for analysis.

**Monte Carlo simulation.** Account for uncertainty in inputs to predictive models. Model uncertain inputs based on historical data or with probability distributions to generate simulated values, and then use them in the predictive model to generate an outcome. The process can be repeated thousands or tens of thousands of times. The result is a distribution of outcomes that can provide answers to questions that are based on realistically generated data.

# Data Preparation and Manipulation

**Preparing data for analysis is an important but time-consuming step in analysis.**

SV Analytica Modeler automates data preparation to ease the process and to help you make sure your data is in the best format for analysis.

The tasks automated include analyzing data and identifying fixes, screening out fields, deriving new attributes when appropriate, and improving performance through intelligent screening techniques.



**SV Analytica Modeler offers a variety of ways to manipulate and prepare data for analysis at the record or field (or variable) level. Among the methods used to help make sure your data is in the best format for the specific type of analysis that is being undertaken are:**

- **Record operations.** Select, Sample and Distinct nodes enable you to choose specific rows of data. You can merge and append nodes to join data by adding columns or rows to a dataset. Aggregate and Recency, Frequency, Monetary (RFM) Aggregate nodes summarize records to a single row. A Balance node adjusts the proportions of records in imbalanced data and a Sort node reorders based on value. The Space Time Box node creates geospatial and time-based data for records.
- **Field operations.** A Type node specifies metadata and properties of a dataset, and the Filter node discards fields. The Derive node creates new fields and a Filler node can replace existing field values. Data can be restructured with the Set to Flag, Restructure or Transpose nodes and regrouped with the Reclassify or Binning nodes. To assist with modeling, the Partition node can split the data and the History node and Time Intervals nodes can create additional fields. The Field Reorder node defines the display ordering to make certain fields easier to view.

# Automated Data Modeling

With the automated modeling features of SV Analytica Modeler, non analysts can produce accurate models quickly without specialized skills. In addition, advanced predictive modeling capabilities enable professional analysts to create the most sophisticated of streams.

Automated modeling enables you to compare multiple modeling approaches. By setting specific options for each model type (or using the defaults), you can explore a multitude of model combinations and options. The generated models are then ranked based on the measure specified, saving the best for use in scoring or further analysis.



# Text Analytics

The interactive, visual environment of SV Analytica Modeler uses advanced linguistic technologies and Natural Language Processing (NLP) to rapidly process unstructured text data. From this text, it extracts and organizes the key concepts. The customizable industry-specific text analysis packages enable you to analyze relevant terms and phrases in addition to acronyms, emoticons and slang in the right context.

Interactive graphs help you explore and display text data and patterns for instant analysis. You can create hierarchical categorization structures and include them as inputs to a predictive model to yield better and more focused decisions and results. Predefined categories, such as hierarchies, annotations and keyword descriptors can be imported to categorize initial unstructured data so you can organize concepts more logically and in greater detail.



# Accommodate your needs with flexible deployment

The deployment of analytics in your organization will depend on many environmental factors. Such factors include the business problems that must be addressed, your choice of operating systems and platforms, and the other technologies and data sources in your infrastructure.

Technology, and particularly software, should be flexible enough to accommodate various permutations and still provide the expected performance and results.



The SV Analytica Modeler architecture is an open one that supports a range of platforms and languages.

You can deploy SV Analytica Modeler in your environment and confidently use it with your existing systems to optimize performance and address your business problems.

## This flexible deployment bridges

the gap between analytics and action

by providing results to people and processes on a schedule or on demand.

SV Analytica Modeler streams can be deployed as scenarios for the purposes of model refresh or automated job scheduling, and you can deploy them with decision management or other predictive applications.

# Optimization

**Optimization** even the most committed organization cannot afford to move every customer to the front of the line, nor can an insurer investigate every claim. Real businesses operate under real world constraints, subject to limits on available staff, equipment and investment.

---



**Optimization** enables organizations to make the most of scarce resources by identifying the solution that best meets a specific goal. Examples include maximizing the revenue from a marketing campaign or minimizing the risk of fraud or churn.

---

**Optimization** can be used on demand, such as on an individual to determine the best offer for that person, or in batch to allocate offers to all eligible customers. For batch optimization problems, integration with IBM ILOG® CPLEX

---



**Optimization** Studio is provided to handle the complex computations that are required.

---

# Execution and Scheduling

SV Analytica Modeler includes capabilities that are designed to use automation to bring greater consistency to your results. Greater consistency strengthens people's confidence in analytics because management can efficiently govern the business environments where analytical processes take place. This governance helps ensure that all internal and external procedural requirements are met.

With SV Analytica Modeler, your analysts can construct flexible, repeatable analytical processes that can be operationalized, that is, initiated at the right time and integrated with other enterprise processes.

Predefined Model Management processes help models remain relevant and accurate.



# In Database

**SV Analytica Modeler provides a number of capabilities to minimize data movement and push analytics to the database, such as...**



**SQL Pushback.** With SV Analytica Modeler Server, moving data from large databases, even in IBM® System z® and IBM PureSystems™ environments, is not required because the analytics and mining can take place in the database. SQL Pushback enables in-database data transformation and preparation without the need to write any SQL or do any programming. The result is a significant improvement in analytical performance.

**In-database scoring.** Database-specific scoring adapters, which are available for IBM DB2®, IBM PureData™ System for Analytics (powered by Netezza®) and Teradata solutions, extend the number of SV Analytica Modeler algorithms that can be scored in database, further reducing the need to extract the data before scoring.

**Database functions.** SV Analytica Modeler can use almost any user-defined functions (UDFs), database aggregate and windowed aggregate functions provided by a database. These are exposed by the SV Analytica Modeler workbench to extend the available native functionality and ensure SQL Pushback.

**In-database mining.** SV Analytica Modeler Server supports integration with the data mining capabilities, modeling tools and database-native algorithms that are available with Pure Data System for Analytics, IBM InfoSphere® Warehouse, Oracle Data Miner, Microsoft Analysis Services and others. You can build, score, and store models inside the database — all from the SV Analytica Modeler workbench.

# Integration with Technology

SV Analytica Modeler includes capabilities for exporting data to IBM Cognos® Business Intelligence and Cognos TM1® software. The results of analysis can be distributed for reporting, monitoring and planning to key decision-makers who only need the results. When further analysis is needed, SV Analytica Modeler can also access them as a data source, which means the process can continue again, thereby feeding the results back to wherever the questions began.



SV Analytica Statistics provides the ability to carry out further statistical analysis and data management to complement SV Analytica Modeler and its data mining abilities with a dedicated section on the nodes.

SV Analytica Modeler provides support for PureData System for Analytics to access specific models from the SV Analytica Modeler Interface and leverage the hardware's speed and performance.

For analytics on big data, the addition of SV Analytica Analytic Server to SV Analytica Modeler enables analytics to be processed in a Hadoop distribution.

SV Analytica Modeler streams can also be deployed with InfoSphere Streams for high velocity streaming data applications requiring predictive scores