



SAS® Visual Data Discovery

Unmatched analytics and interactive, dynamic data visualization in a single, easy-to-use package

What does SAS® Visual Data Discovery do?

SAS Visual Data Discovery, powered by JMP® 9 software, provides a point-and-click interface to the advanced analytic capabilities of SAS. It enhances advanced analytics and exploratory data analysis with interactive data visualization, leading to better analyses, faster decisions and more effective presentations of analytic results.

Why is SAS® Visual Data Discovery important?

SAS Visual Data Discovery combines the power of SAS data access and advanced analytics with JMP software's interactive interface. It provides unmatched advanced analytics with data visualization, delivering the ability to interactively explore ideas, investigate patterns, discover previously hidden facts and reveal opportunities through visual queries.

For whom is SAS® Visual Data Discovery designed?

SAS Visual Data Discovery is designed for business analysts, researchers, statisticians, engineers and scientists who want to make better use of organizational data and information. It is designed for those who have a need for advanced statistical capabilities along with dynamic visualization in a self-provisioned, interactive environment and who are restricted by the limitations in desktop statistical packages, spreadsheets and static graphs.

Today's organizations face enormous challenges with analyzing and reporting on large amounts of data spread across multiple systems. For many, data sources have gotten so large and varied that the majority of statistical software products just can't handle them. IT staff often must create custom extracts for business users. Increasingly advanced statistical methods are needed, along with analyses that can be verified and documented to meet compliance standards. On top of that, static reports and graphs with no interactive capabilities for dynamically exploring data make it difficult to discover relationships and determine organizational impacts.

SAS Visual Data Discovery can help enhance analytic effectiveness to deliver faster insights. It combines Base SAS, SAS/GRAPH® and SAS/STAT® software, along with two interfaces (SAS® Enterprise Guide® and JMP®), to provide users with an easy-to-install, easy-to-use advanced analysis and data visualization package.

In addition, an enterprise version offers access to data resources across the organization with the inclusion of SAS Integration Technologies and a choice of one SAS/ACCESS® engine.

Key Benefits

- Enhance analytic effectiveness for faster insights and actions.** Exploratory data analysis and interactive data visualization are provided in an extendable point-and-click environment so information can be viewed in more compelling ways. GUIs provide access to specific SAS capabilities without writing any code.
- Take advantage of all data to uncover new opportunities.** SAS Visual Data Discovery is designed to handle large, disparate data sources, so that all available data can be used for analysis.
- Reduce overall costs and complexity with a consolidated vendor portfolio.** A full range of analysis, reporting and visualization capabilities from one vendor reduces the cost of licensing, maintenance, training and support, and ensures that consistent information is available across the enterprise.
- Achieve corporate and governmental compliance.** Produce repeatable results that are easily documented and verified to meet the requirements of auditors and regulators.
- Move the discovery process forward by applying the latest statistical techniques.** SAS statistical capabilities are constantly being updated to reflect the latest advances in statistical methodology. And, SAS technical support delivers a level of service not often found with other software vendors.
- Create and use custom add-ins.** It is easier than ever to extend the use of powerful analytics throughout your organization. You can create custom analytic applications (add-ins) to share with others. You can even customize menus and toolbars for your add-in.

In addition, sharing analytic results interactively and visually leads to enhanced communication, enabling consumers of analytic results to make faster, better decisions. Interactive Adobe Flash animations can be exported into presentations, Web pages and other documents.



Product Overview

SAS Visual Data Discovery provides two interface options for point-and-click access to data preparation, graphical and analytic functions. SAS Enterprise Guide lets users build queries, manipulate and update data, perform simple to complex analyses, and run analyses in batch mode if desired. JMP offers a discovery and exploration interface with interactive analytical capabilities. Users can achieve analytic excellence with the right data and the best analytic techniques that are available. SAS Visual Data Discovery is easily augmented for specialized users by adding SAS/ETS[®] for forecasting, SAS/OR[®] for optimization, SAS/QC[®] for quality improvement or SAS/IML[®] for matrix programming.

Highly Interactive Statistical Graphics

By interacting visually with data and analysis results, users can explore information and glean new insights more easily. With SAS Visual Data Discovery, users can grab, spin and slice their data, viewing it from multiple-direction dimensions. Interactive graphs range

from 3-D scatter plots to trellis plots, cell plots, needle plots and summary charts. Animated bubble plots put graphs in motion for a more engaging experience. With the JMP Graph Builder, you can incorporate geographic maps into graphs, graph two independent Y variables on separate axes, see the shape of your data using density contours and plot error bars and confidence intervals while using new custom color scale and gradient capabilities. Interactive Adobe Flash animations can be exported and placed in presentations, Web pages or other documents.

Visual Querying and Data Filtering

With SAS Visual Data Discovery, you don't have to develop complex SQL queries because querying data is visual, intuitive and dynamic, and results are displayed immediately. Users can interactively filter and query data, browsing and rearranging data at will. Any number of columns can be added to the data filter, including continuous, categorical and hierarchical variables. You can preview a fixed number of rows, choose columns, visually subset data, animate

reports or drill down to underlying data, generate SQL or write custom code – all through an intuitive point-and-click interface. All graphs and reports are dynamically linked and updated automatically.

Extensible Visual Analytics

SAS Visual Data Discovery supports both the information producer and consumer with the ability to surface and analyze information from other software packages and share these visual results in an easy-to-understand manner. This enables more users across the organization to quickly assess and realize value from information assets via dynamic graphics and reports.

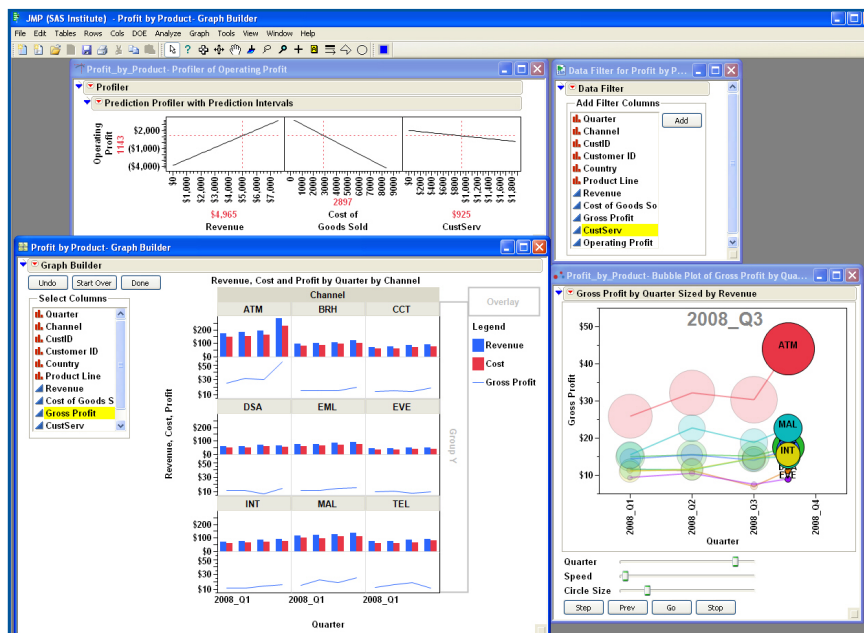
Integration with SAS[®]

SAS functionality can be called through the JMP Scripting Language or SAS Stored Processes, or it can be coded in the SAS program editor. Custom GUIs to SAS Analytics can be easily created using SAS Enterprise Guide. This enables SAS programmers to further leverage their SAS skills and core SAS capabilities, including analytics, stored processes, centralized metadata, SAS code, SAS reports and SAS output, and make interactive, analytic results available to others in the organization. Users can explore data on their own and do not have to depend on IT to fulfill their ad hoc requests.

SAS[®] Add-Ins for JMP[®]

Integration of SAS and JMP for targeted applications may expand access to specific SAS software features for users who might already be comfortable working with the JMP interface or who prefer not to write code. The applications below feature advanced analytic procedures from SAS delivered in a JMP environment.

Using a graphical interface, SAS Structural Equation Modeling for JMP



With SAS Visual Data Discovery you can incorporate multiple visuals to find trends and relationships in your data to drive better decision making.

enables you to specify a path diagram to represent one of a variety of structural equation models. You can specify models with only observed variables (for example, regression and path analysis models) or models that have both observed and latent variables (for example, factor analysis and latent curve models). In addition to building path diagrams, the interface can translate the path diagrams into SAS/STAT statements, run the statements and display the results in JMP.

SAS Econometrics and Time Series Analysis for JMP is a GUI that provides access to SAS/ETS procedures. You can use the interface to build autoregressive or heteroscedastic error models, unobserved component models and panel analysis models. After you specify a model in the interface, the model specifications are translated into statements for the relevant SAS/ETS procedure, the statements are run and results are displayed in JMP.

Add-In for Microsoft Excel

With the JMP add-in for Microsoft Excel, you can easily move your data from Excel into JMP. You can also bring the visualization power of the JMP Profiler to your Excel spreadsheets. Interactively explore what-if scenarios using the Profiler as Excel calculates the model in the background, receiving inputs from JMP and sending back outputs. Use the JMP Optimizer to find the best solutions to problems and get instant insight into the key factors influencing risk with the simulator that is built into the Profiler.

Integration with R

With the R open-source statistical programming language, R programmers can leverage the dynamic graphics in JMP that interactively link data to visuals. R programmers can also build JMP add-ins that make advanced R capabilities accessible to nonprogrammers.

Comprehensive Tools for Exploratory and Advanced Statistical Analysis

With SAS Visual Data Discovery, the broad and deep range of SAS software's advanced analytics are available from an easy-to-use, point-and-click interface.

Analysis of variance

Analysis of variance is a technique for analyzing experimental data. Users can perform analysis of variance for balanced or unbalanced designs, multivariate analysis of variance and repeated measurements analysis of variance. Users can also fit general linear models and mixed models for a variety of data situations.

Regression

Regression analysis examines the relationship between a response variable and a set of explanatory variables. SAS Visual Data Discovery uses least squares to estimate parameters, includes many different model selection methods and produces a variety of diagnostic measures. More specialized procedures fit generalized linear models, mixed linear models, nonlinear models and quadratic response surface models.

Categorical data analysis

In categorical data, the outcome of interest reflects categories with data often presented in tabular form, known as contingency tables. Users can investigate the association in a contingency table as well as produce measures that indicate the strength of that relationship. Parametric models can be used to investigate the variation of a function of the outcome variable across levels.

Mixed models

A mixed model contains both fixed and random effects. A suite of procedures is available for fitting both linear and nonlinear mixed models, generalized linear mixed models as well as large mixed

model problems using sparse matrix techniques.

Bayesian analysis

Bayesian analysis provides a natural and principled way of combining prior information with data, within a solid decision-theoretical framework. It provides inferences that are conditional on the data and are exact, without relying on approximation methods. Capabilities include generalized linear models, accelerated life failure models and Cox regression models. SAS also provides flexible simulation procedures that are suitable for fitting a wide range of Bayesian models.

Survival analysis

Survival analysis concerns data that measures lifetime or time until an event. In many cases, only upper or lower bounds are available for some observations. This is known as censoring. Survival analysis methods correctly use both censored and uncensored observations. SAS Visual Data Discovery compares survival distributions for the event-time variable, fits accelerated failure time models to event-time data and performs regression analysis based on the proportional hazards model.

Design of experiments

The design of experiments provides a strategy for setting up experiments in which all variables are varied in a systematic manner to determine the correlation between variables and predict results. State-of-the-art design of experiments (DoE) capabilities make it easy to design and analyze the most efficient experiment for your needs.

Cluster analysis

Cluster analysis places observations into groups based on similarity. SAS performs hierarchical clustering of multivariate data or distance data with graphical tree diagrams, disjoint clustering of large

data sets and nonparametric clustering with hypothesis tests for the number of clusters.

Nonparametric analysis

Nonparametric analysis analyzes data not requiring specific distributional assumptions such as normality. SAS performs nonparametric analysis of variance as well as other rank tests for balanced or unbalanced one-way or two-way designs. Exact probabilities are computed for many nonparametric statistics.

Survey data analysis

Researchers often use sample survey methodology to obtain information about a large population by selecting and measuring a sample of the data. Tools are provided for selecting probability-based random samples from a study population and analyzing the sample survey data. Procedures for computing summary statistics, analyzing contingency tables and building linear and logistic regression models enable users to incorporate the sample design into analysis.

Power and sample size computation

Study planning procedures enable you to optimize your resource usage during the design of a study, aid in determining the sample size required to get statistically significant results and help you to detect a meaningful effect.

SAS® Visual Data Discovery System Requirements

To learn more about SAS Visual Data Discovery system requirements, download white papers, view screenshots and see other related material, please visit www.sas.com/visualdatadiscovery.

Key Features

Highly interactive statistical graphics

- Interactive graphics include:
 - Animated bubble plots show data with sized bubbles that move over time.
 - 3-D scatter plots with categorical and continuous data.
 - Scatter plot matrix with categorical and continuous data.
 - Trellis plots, summary charts, cell plots, line plots, needle charts and path diagrams.
- Create new graphics via the JMP Scripting Language.
- Incorporate geographic maps into graphs.
- All graphics interact via the data table with brushing, highlighting, hiding and other capabilities.
- Interactive Adobe Flash animation can be exported for use elsewhere.

Visual querying, data filtering and extensible visual analytics

- Handle virtually unlimited data and rearrange data at will.
- View and interact with dynamically linked statistics, tables and graphics.

Extensible visual analytics

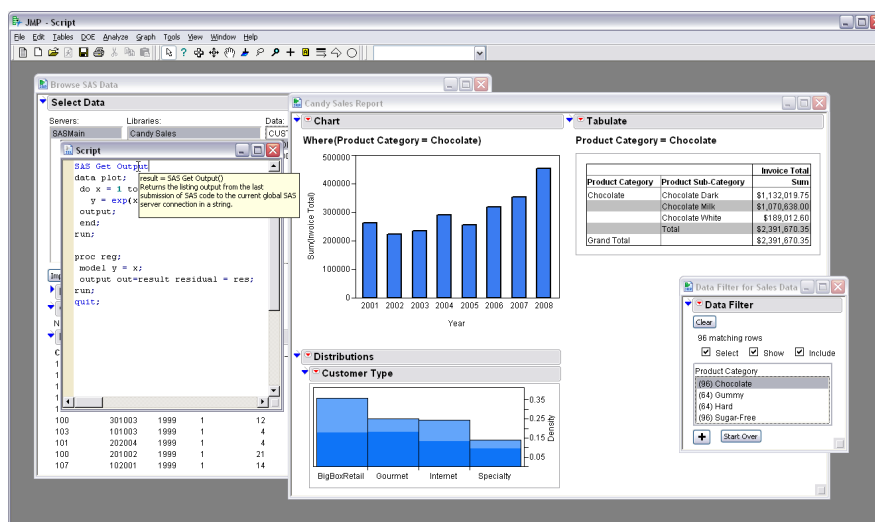
- Extend analytics capabilities by adding custom analyses with the SAS programming language.
- Eliminate the need to write code using JMP GUIs for select SAS/STAT and SAS/ETS procedures.
- Easily move data from Excel into JMP using the add-in for Microsoft Excel.
- Provides integration with the R open-source statistical programming language.

Comprehensive set of tools for advanced statistical analysis

- Analysis of variance, regression and categorical data analysis.
- Multivariate analysis, survival analysis and psychometric analysis.
- Cluster analysis, nonparametric analysis and survey data analysis.
- Mixed models and Bayesian analysis.
- Multiple imputation for missing values.
- Power and sample size computation.
- Time series analysis, design of experiments, nonlinear modeling and decision trees.

Increase use of core SAS® capabilities

- SAS® Analytics and SAS® Stored Processes.
- SAS code, reports, output and integrated metadata.



SAS Visual Data Discovery provides point-and-click access to the most needed data preparation, graphical and analytic functions.