

“Panopticon makes the perfect set of visualization tools for CEP. And you can quote me on that!”

— Marc Adler
Blogger and Financial
Services Systems Expert

“We made a thorough survey of our alternatives and selected Panopticon due to its very intuitive display of data and the ease of integration.”

— Jerome Tordo
Founding Partner & Managing Director
Sycamore Asset Management

Effective Monitoring & Analysis of Real-Time Risk, Performance and Attribution Data

Panopticon developed its data visualization tools to provide C level executives, fund managers, traders, and others with the monitoring and analysis tools they need to conduct profitable business while maintaining a close eye on risk exposures. Our platform combines:

- Ability to connect to virtually any data source, including streaming real-time data sources like Active MQ, Apache QPID and Sonic MQ message buses, Complex Event Processing (CEP) engines like Sybase CEP, relational databases like Oracle, DB2, Sybase ASE, or SQL Server, and column-oriented databases like Sybase IQ or Kx kdb+.
- Fast development, deployment and training cycles to ensure quick ROI.

Panopticon is available in three versions:

Developer SDK allows programmers to embed the Panopticon StreamCube™ OLAP data model and data visualizations into their own applications. The SDK supports code-level integration with existing enterprise applications, client/server, or web-enabled, thin-client deployments. The technology is an excellent fit with SOA-enabled architectures. It is capable of receiving streams of data and events, then presenting the information to analysts in a useful graphical format. The system supports Java, .NET and Microsoft Windows Presentation Foundation (WPF) environments.

Panopticon EX is a fully productized system designed for rapid deployment at the workgroup or enterprise level. It incorporates a wide range of data visualizations, from Treemaps and Heatmaps to Scatter Plots and Bullet Graphs, and uses our unique StreamCube™ OLAP data model for on-the-fly data aggregations and slicing and dicing. The platform includes a desktop authoring tool that allows power users to assemble and publish new monitoring and analysis dashboards to the web.

Our unique **Rapid Development Kit** offers a range of features that make it easier than ever to build, publish and embed comprehensive dashboards into your own applications. It utilizes our Panopticon EX Designer tool to allow business users to quickly build their own interactive analytical dashboards. It also uses core components from the Developer SDK to allow you to tightly embed those dashboards into your own software systems. With the RDK, you only need to write a few lines of code to add embedded dashboards to your applications.

Visualize Real-Time & CEP Data in Financial Services Applications

Financial markets are dynamic - they change rapidly and constantly. Business rules and processes cannot remain static; software needs to adapt to changes in the markets. Hedge funds, investment banks and mutual fund companies use CEP and real-time streaming feeds combined with Panopticon's data visualization tools to implement user-friendly solutions that help managers adapt to market changes quickly.

In particular, capital markets are embracing this combination of CEP, real-time and visual analytics since real-time insight and rapid response is critical. The rate at which new information comes onto a trader's desk can be overwhelming without these tools. Instead of spending hours plowing through traditional reports, portfolio managers can spend minutes or even seconds with an analytical dashboard to identify actionable outliers, patterns and trends.

Visualize Real-Time Financial Data

Financial institutions use Panopticon's ability to visualize real-time and CEP data in many ways, including:

- Market data enrichment to synthesize new market data from raw inputs. Combine data from different sources based on rules and then visualize the results in Treemap, Heat Map, Scatter Plot and other information visualizations presented in interactive dashboards. Compute and display insights like “best bid and offer” data across specific markets.
- Market liquidity analysis to combine order book data from multiple markets to analyze full market liquidity, to determine where, when and how to trade.
- Quantitative trading to monitor the market for pre-defined conditions that represent opportunities, automating the response to capitalize on the opportunity before it disappears.
- Algorithmic execution is the process used for most common automated trading orders. As more people use this method, algorithms keep changing for those in search of an edge. CEP combined with Panopticon's ability to visualize trading data help get new algorithms in place quickly.
- Smart order routing using live market data to intelligently route orders for best results and in compliance with best execution policies.
- Best execution compliance to collect data at the time of each trade to monitor and show compliance with best execution policies.
- Order stream analytics to monitor order flow in real-time for insight into market dynamics and customer behavior; watch for patterns of undesirable trading.
- Real-time portfolio valuation to continuously update positions in real-time using incoming transactions and value positions using live market data, including net gain/loss and exposure calculations.
- Generate alerts when thresholds or limits are approached or exceeded.
- Real-time risk aggregation to consolidate position and risk information from multiple systems to monitor consolidated exposures in real-time.

True Real-Time Performance

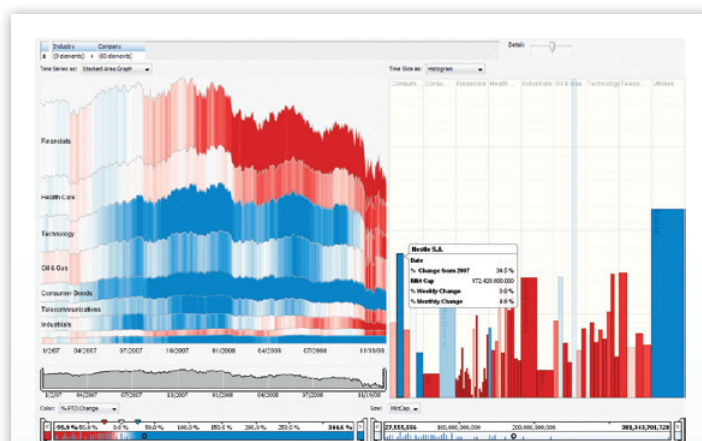
The idea of “real-time” can be very confusing, since virtually all software companies that do visualizations say they can handle “real-time” requirements. However, what most of them mean is that their software goes out and requests an update from an external data source when the data is needed. For example, a system might make an update request in order to generate a new graph. The system pulls the updated data from the external source and uses it in the display – at the moment when the data was pulled. The data is accurate as of that exact moment, but it becomes out-of-date immediately since no further updates are available until a complete refresh is done.

With Panopticon, external systems like CEP engines and message buses constantly push data into our system – not at a regular interval, but **instantly, as-it-happens and on a tick-by-tick basis.**

In-Memory OLAP Data Model Can Connect To Any Data Source

Panopticon's unique StreamCube™ data model supports the ability to connect to virtually any data source, including relational databases, real-time streaming data feeds, and the output of CEP engines. It can handle traditional multidimensional analysis for static data (like those specified by the MDX language) and also for dynamic data streams.

Many data models on the market support multidimensional analytical OLAP functionality; however, they are generally not optimized for real-time performance. The Panopticon StreamCube™ is specifically designed to make extremely fast calculations using continuously updated data. The StreamCube™ matches the requirements that live visual interactive displays pose to a data back-end. This involves being able to bind aspects of the data to multiple visuals and associated analysis controls. Most other data models either cannot handle streaming data, or their performance degrades significantly when presented with large streaming feeds of real-time data.



A set of linked data visualizations display two years of performance data for a portfolio of 103 stocks. This configuration shows time series data on the left and static data for any selected point in time on the right. The color of each element corresponds to the price performance of each equity or equity category. Size corresponds to the market cap of the holdings. Filters make it easy to focus on specific periods of time and specific groups of equities based on performance, analyst ratings, market cap, price, exchange, and other criteria.

“ The evaluation process allowed us to minimize risk from the process of purchasing and implementing an important solution. Panopticon consultants spent time with Fidelity's team to understand our needs and worked alongside us to provide pragmatic solutions. ”

— Jonathan Schapiro
VP Equity Trading Technology, Fidelity Investments

Solutions for Financial Services

Panopticon is deployed in banks, hedge funds and brokerages all over the world. Here are two examples of common challenges in financial institutions that Panopticon tools can help address.

Counterparty Risk: Real-time insight throughout the trading day.

Increased market volatility means that financial services firms must have insight into their exposures throughout the day for adequate risk analysis. Fund managers use Panopticon data visualization software to monitor risk limit usage and to analyze risk data generated by an external risk engine. Our dashboards help users spot problems and opportunities in the data faster than is possible with any traditional reporting system.

Whether you are looking at risk in real time, intraday, end of day, or on a historic basis, this flexible platform is adaptable to the needs of very large as well as smaller banks, hedge funds and mutual fund companies. Panopticon supports key functions that make risk analysis much more effective and efficient, including the ability to:

- Subscribe to full and parameterized streams from a CEP engine.
- Display and interact with hierarchies like book structure, product structure, counterparty structure, geographic, industrial, issuer rating, asset class, and so on.
- Dynamically change additive hierarchies and aggregate values based on end-user interaction.
- Drill and jump between data dimensions (for example, jump from book to positions to instrument to counterparty).
- Perform risk aggregation and netting.
- Handle non-additive data sets like Value at Risk (VaR) where the aggregates must be retrieved from an external risk calculation engine.
- Time window and time period analysis to identify delta changes between time period.
- Visualize trends, clustering, correlations, and outliers.

The system allows managers to monitor data from real-time market feeds, trading systems and other sources using an intuitive and interactive web-based interface that allows in depth analysis of fast changing risk information.

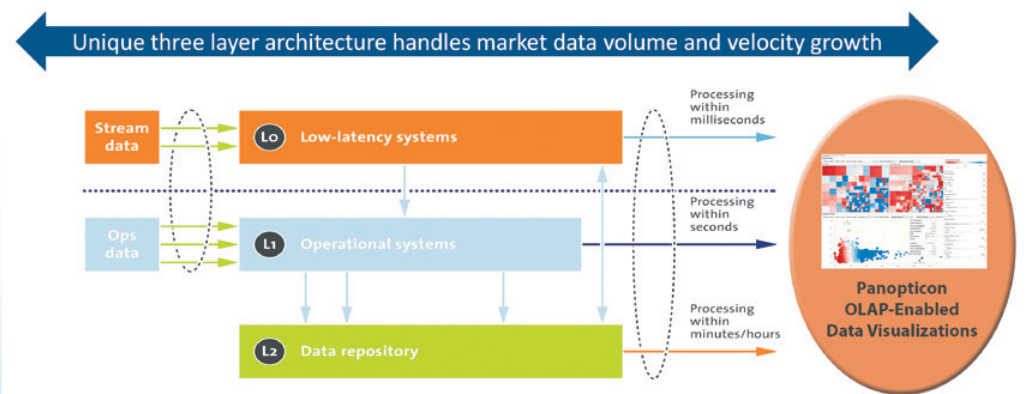
Trade Monitoring: Global View of Performance, Exposures and Risk on a Single Screen

Panopticon's Trade Monitoring Solution is a set of indispensable tools that help managers quickly identify anomalies and track the activities of their brokers. The system gives managers the ability to oversee the risk profile of all trading activities across the entire enterprise. No more trying to laboriously piece together the picture using reports. A manager can see a global view of trading activities on a single screen, understand exactly where the organization sits in terms of enterprise risk, and see how well each trader is performing. Panopticon Trade Monitoring quickly pays for itself many times over by helping managers spot problem trades before they can be executed and by helping them see opportunities they would easily miss using standard reports.

Managers using Panopticon's Trade Monitoring solution can view the status of their Ordered/Placed/Executed (OPE) trades and easily gauge the efficiency of their market activity. Panopticon interactive visualizations display views at the Trader, Broker, Fund, Team, Sector and Security levels with OPE relative to intraday and longer term day impact, price changes and relative workloads. In addition to helping them easily oversee and understand the enterprise risk profile, Panopticon's ability to handle and visualize real-time streaming data allows managers to easily benchmark the holdings and performance of their operation against various indexes.

Managers can also monitor relative workloads, performance of traders compared to goals, day impacts, execution risk, accumulated and averaged values, ordered values versus executed values, and other criteria that will help them better manage their people and operations. The software's comprehensive analytical capabilities also help managers make more effective and useful reports to other departments, supervisors and clients.

A platform incorporating Panopticon's OLAP-enabled visual data analysis software, CEP engines, column-oriented databases, and row-oriented databases offers a unique three layer architecture optimized for capital markets applications. The system is able to handle multiple real-time streaming feeds from trading systems and external data providers. It allows managers to analyze counterparty risk using all available historical information combined with up-to-the-second market and trading data. They can spot problems quickly — often within seconds.



Powerful Visualizations Designed to Work with Time-Critical Data

Panopticon supports a wide variety of information visualization techniques, including:

- Treemap
- Heat Map
- Heat Matrix
- Bullet Graph
- Scatter Plot
- Horizon Graph
- Stack Graph
- Needle Graph
- Surface Visualizations

These visualizations and the many others supported in Panopticon systems help users see multi-leveled hierarchies, interconnections and details on individual objects in order to solve problems, understand complex relationships or identify areas of concern.

Our visual analytics tools are optimized for handling time-critical data, including data that may be changing very quickly, even in real time. These tools enable complete understanding of the data at a glance by taking into account the latest research on human perception.

About Panopticon

Financial institutions all over the world use Panopticon software to help them make insightful, informed and profitable decisions. Panopticon's data visualization software together with its Real-Time Business Intelligence capabilities helps them understand correlations, identify outliers and see trends that are obscured in traditional reports.

Panopticon's clients use the company's data visualization software tools to speed up their business processes, reduce operational and investment risks, detect anomalies (including fraud), and identify opportunities to increase profits and sales. They help people see hidden patterns or spot problems in addition to helping them identify useful opportunities in their data.

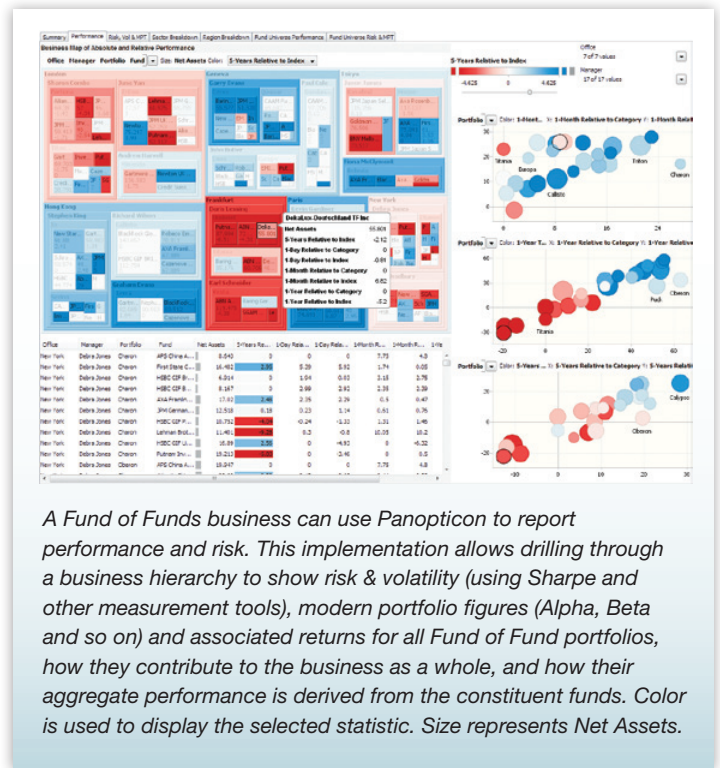
Panopticon's platform excels in:

- Transforming data into intuitive academically validated graphical displays that are easy to understand and use.
- Enabling monitoring and analysis of multi-dimensional data with our fast, in-memory OLAP data model.
- Connecting to virtually any data source, including real-time streaming feeds, message buses, the output of Complex Event Processing (CEP) engines, relational databases, and proprietary data formats.

The Panopticon platform is available as an SDK that enables software companies and corporations to embed these capabilities into their own applications and in our Panopticon EX product designed for fast deployment at the enterprise, workgroup or desktop levels. We also offer our unique Rapid Development Kit; the RDK combines the ease-of-use available in EX with the integration capabilities of the Developer SDK.

“Panopticon visualizations show investors how their funds are moving throughout the day. It gives an instant, at-a-glance view of how the market is doing. You can start drilling down instantly without having to look through news wires. We were one of the first banks to implement it.”

— Silvio Olivero
Vice President of E-Marketing
JP Morgan Chase



A Fund of Funds business can use Panopticon to report performance and risk. This implementation allows drilling through a business hierarchy to show risk & volatility (using Sharpe and other measurement tools), modern portfolio figures (Alpha, Beta and so on) and associated returns for all Fund of Fund portfolios, how they contribute to the business as a whole, and how their aggregate performance is derived from the constituent funds. Color is used to display the selected statistic. Size represents Net Assets.

Contact Us

New York +1 646 912 8444
San Francisco +1 415 683 7398
London +44 20 7877 0640
Stockholm +46 853 480 480
info@panopticon.com
www.panopticon.com

April 2011
Panopticon for Financial Services Brochure
© 2011 Panopticon Software AB

The information in this document is subject to change without notice and is offered for informational purposes only. All trademarks used herein, whether recognized or not, are the properties of their respective companies.