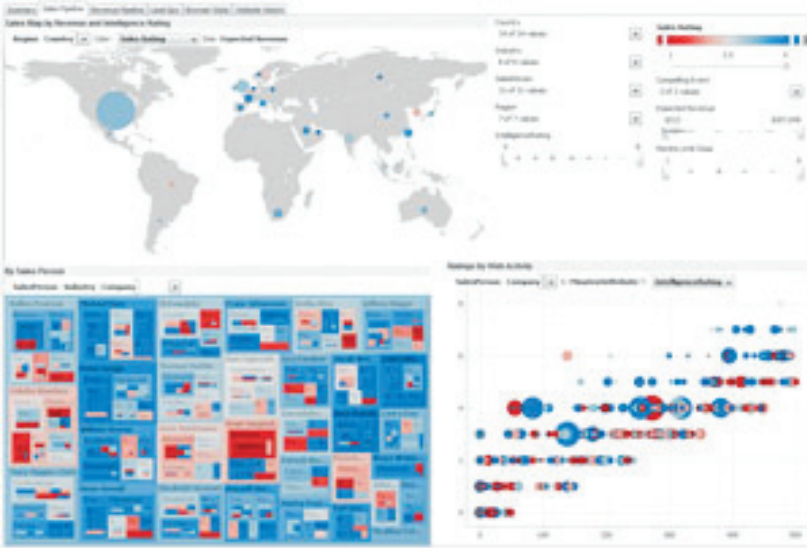


Panopticon Developer SDK: Embed Real-Time Analytical Dashboards into Your Enterprise Applications



“ The Developer SDK’s efficient design and comprehensive documentation allowed our team to be up and running with initial prototypes in just a few days. Panopticon’s wide acceptance with major banks and hedge funds helps underscore the benefits of a visualization-enabled approach to performance and risk management. ”

— Dr. Lance Smith
CEO, Imagine Software

Comprehensive Data Visualization Toolkit for Any Development Environment

Many of the world’s largest companies use Panopticon technology to help their business users navigate huge amounts of data quickly and make more insightful decisions. Panopticon’s SDK lets you tightly integrate an array of interactive visual data analysis components into your own proprietary applications. Panopticon Developer includes our StreamCube™ in-memory OLAP cube, an application programming interface (API), and a complete set of controls – along with comprehensive documentation explaining every aspect of how to use the software and numerous code examples.

Panopticon offers two versions of the Developer SDK:

- Java (Swing)
- Windows .NET (WinForms, WebForms and WPF)

You can use the SDK to embed our visual monitoring and analytics tools in HTML-only, thin client, or thick client applications. Both versions of the Developer SDK offer identical functionality.

“ By extending the Thomson Reuters Enterprise Platform for Velocity Analytics with a visually intuitive display, we will enhance our clients’ ability to find and monitor their trading strategies. ”

— Emmanuel Doe
Global Business Manager, Thomson Reuters

Build New Modules or Enhance Existing Software

Panopticon Developer is built for enterprise level deployment and designed using established best practices for information visualization. The SDK allows you to completely customize the GUI so the visualizations match the look and feel of the rest of your application. Use the Panopticon SDK to:

- Provide improved decision support tools to users
- Create comprehensive graphical reporting and presentation tools
- Refresh the look and feel of legacy applications

The Panopticon development team uses the same SDK that we make available to our customers to build our Panopticon EX application suite for enterprise and desktop deployment.

Deployed applications utilizing the Panopticon Developer SDK include:

- Real-Time Performance Monitoring and Risk Analysis in Financial Services
- Network Monitoring and Analysis in Telecommunications Networks
- Client and Product Profitability Analysis
- Budgeting and Scheduling Analysis in Engineering

Fast In-Memory OLAP Data Model Supports Real-Time Streaming Data

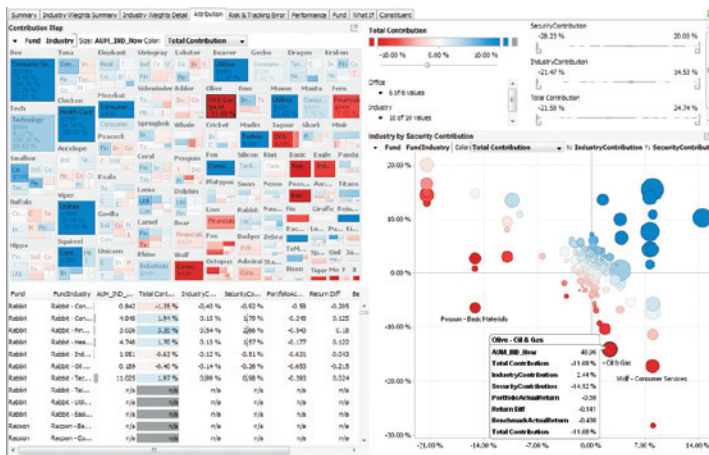
The SDK includes our robust and flexible StreamCube™ in-memory OLAP data model. The StreamCube™ is designed to process real-time data streams from Apache Active MQ, Apache QPID, Sonic MQ, Sybase CEP and other real-time sources.

When the user manipulates a visualization using the controls provided with the SDK, the data model does the calculations necessary to display the information. The StreamCube™ data model can interact with any number of disparate data repositories ranging from traditional relational databases like Oracle or SQL Server to event-driven message buses and Complex Event Processing (CEP) engines.

Panopticon Developer components and controls can bind to tabular or relational data without requiring developers to manually build data trees in code. The in-memory OLAP functionality included in the StreamCube™ data model allows interactive, on-the-fly slicing and dicing of data – like in a Pivot Table – with automatic calculations of relevant aggregates. This works for large static datasets as well as real-time streaming feeds. The system works well for quantitative data analysis but is also a great fit for reviewing qualitative data like news feeds.

“ The StreamCube™ data model made it easy for us to handle the large, fast-changing operational databases typically used in our client sites. ”

— Kenneth D'Silva
President
Opturo® Investment Process Optimization™



The Panopticon Developer SDK can connect directly to fast-changing operational data — **as fast as real time** — from streaming data sources.

Plug-In Architecture Makes Adding New Visualizations and Data Connections Simple

The Panopticon SDK includes a pluggable mechanism for fully interactive visualizations that makes it a snap to add new visualizations without making substantial changes to your existing implementations. This same Plug-In Architecture allows you to introduce new data sources without re-writing the whole application. The SDK includes a special control that processes data based on input from the user interface and presents it to the visualization controls. This greatly simplifies your development and maintenance tasks while keeping your applications up to date with minimal resources.

Connect to Relational Databases

The SDK can handle data from many different relational databases, including Oracle, Sybase, Kx, Kognitio, DB2, Microsoft SQL Server, MySQL, and Microsoft Access as well as Microsoft Excel and similar flat file formats. The system's plug-in architecture makes it possible to add additional data connectors at any time, whether for traditional data repositories or event based message buses.



Connect to CEP Engines

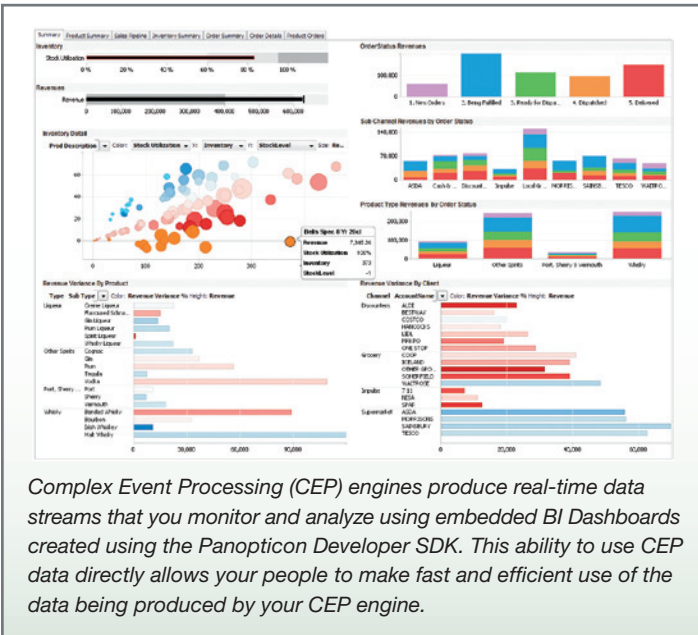
Complex Event Processing (CEP) is one of the most exciting new technologies to emerge in the IT world in several years. CEP engines generate real-time streams of data by applying user-programmable business logic to the interactions and causal relationships between thousands or even millions of constantly changing events being fed into the system.

CEP engines are capable of processing incoming data very quickly — in just a few milliseconds. Our Developer SDK makes it possible to harness this real-time power efficiently, since a real-time stream of valuable data is worthless without the proper tools to interpret it.

Panopticon's SDK allows you to build and embed Dashboards that use CEP data — alone or in combination with historical data sources and/or other real-time streams. Our interactive visualizations make it easier and faster to interpret CEP data effectively so your people can make more insightful and better informed business decisions.

CEP combined with Panopticon real-time dashboards and historical data sources make it possible to:

- Spot patterns or trends that represent opportunities or threats, as they happen, so you can respond immediately
- Combine data from multiple sources and continuously compute aggregated values that let you understand your true position and/or exposure at any given time
- Constantly monitor the interaction of data from multiple sources so you can adjust to changing conditions
- Automate decisions that utilize information based on up-to-the-second data



CEP combined with Panopticon data visualization technology supports:

- Business Activity Monitoring
- Business Process Management
- Market Liquidity Analysis
- Real Time Risk Management
- Algorithmic Trading
- Event-Driven Architectures
- Network and Business Level Security
- Network Performance Analysis
- Real-Time Conformance to Regulations and Policies

You can connect to CEP engines using the SDK and use the data as a source for our comprehensive range of data visualizations.

Comprehensive Documentation - Fast Development Cycle

Our Panopticon Developer SDK is designed to be easy to learn and use. This is a complete kit with everything you need, including comprehensive technical information that will help you understand the best ways of working as well as higher level user manual documentation. There are a large number of working examples showing the simplest way to embed real-time visual analytics in your applications.

The combination of the value provided by our visualizations, our screening tools plus our streaming in-memory OLAP data model means that you will achieve your ROI very quickly.



Panopticon Developer SDK is available for .NET, Java and Microsoft Windows Presentation Foundation (WPF) development environments.

Powerful Data Model

- In-Memory OLAP data model
- Supports true real-time streaming data and multi-dimensional data
- Supports continuous time series including animated playback through time slices
- Handles aggregations and calculations
- Handles data model shadowing and synchronization

Controls

- EX Panel (Java & WPF)
- Visualization Control
- Numeric Filters for filtering across either Numeric Ranges or Percentile Distributions
- Text Filters for filtering across categorical dimensions (Free Text or List)
- Time Window Filters for defining time windows, and selecting time slices
- Breakdown Widget for defining hierarchies, selecting visible detail level and drill
- Pivot Controls for controlling cross tabbing
- Lightweight .NET web controls enable zero-footprint client deployments

“ The range of applications for the Panopticon software is amazing and it allows us to integrate it with almost any technology stack on our side easily and quickly. ”

— Kuldeep Chaudhary
VP, Global Equities Technology
Citi Markets and Banking

Embed the Perfect Tool for Time Series Data Analysis into your Applications



The ability to handle very large quantities of multivariate time series data is an essential element in a complete visual analysis system. Our time series capabilities are especially important for users in global

investment banks, hedge funds, proprietary trading firms, exchanges, and other financial services institutions.

A common requirement in capital markets applications is the analysis of tick data, which is voluminous and typically requires specialized databases like Sybase IQ or Kx. Panopticon Developer can handle virtually any amount of data required to support historical visual analysis of large blocks of financial instruments for any amount of time.

Panopticon Developer offers a range of specialized data visualizations, including Horizon Graphs, Stack Graphs and Line Graphs, designed specifically to make analyzing historical data easier and more efficient.

Development Approaches

Panopticon supports two methods of embedding our visual analysis SDK into custom applications:

- Embed the core components of the SDK. With this method, the developer links the components together and has complete control over every aspect of the user interface and the functionality of the system.
- Embed Panopticon EX Workbooks into custom WPF or Java applications. Very little coding — only a few lines in most cases — is required to complete a project. Users can load and modify streaming EX Workbooks on the fly. Business personnel can use the EX application to design dashboards that meet their business requirements and the developer can then quickly embed those completed dashboards into the custom application. This allows developers to focus on their core competencies.

Panopticon Software

Companies 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 three areas:

- 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

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Visualizations in the Panopticon Developer SDK

Although we are best known for our Treemaps, Panopticon Developer includes a vast range of visualizations including:

- Bar Graph (Horizontal, Vertical, Netted, Grouped & Stacked)
- Barseries
- Bullet graph (Horizontal & Vertical)
- Candlestick Graph
- Dot Plot (Horizontal & Vertical)
- Heat Map
- Heat Matrix
- Horizon Graph
- Line Graph
- Needle Graph
- Numeric Line Graph
- OHLC Graph
- Percentage Area Graph
- Pie Chart
- Pivot Table
- Scatter Plot
- Sparklines
- Stack Graph
- Surface Plot
- Tile
- Treemap (Classic, Window & Cluster)