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IBM i2 Analyst's Notebook

Provides a rich and powerful range of assisted analysis and visualization capabilities

IBM® i2® Analyst's Notebook® offers a rich visual analysis environment designed to help analysts and their organizations turn large sets of disparate information into high-quality, actionable intelligence to help identify, predict and prevent criminal, terrorist and fraudulent activities.

A flexible data acquisition approach allows analysts to more quickly collate both structured and unstructured information to help build a single, cohesive intelligence picture. The flexible data model and visualization environment coupled with a wide range of visual analysis tools help users build multiple views for detailed network, temporal, statistical, or geospatial analysis and reduce the time taken to identify key connections, networks, patterns and trends that may exist.

The results gained from this detailed analysis can be shared via intuitive and visual briefing charts or visualizations that can be included in end intelligence products. These can simplify the communication of sometimes complex information and ultimately help to drive more timely and accurate operational decision making.

A technology road tested by over 2,500 organizations worldwide, Analyst's Notebook is designed to help government agencies and private sector businesses in their fight against increasingly sophisticated criminal and terrorist organizations.



“Analyst’s Notebook comprises of a wide range of analysis and visualization capabilities and offers users key benefits in different areas.”

Who should read this white paper

This white paper has been written for:

- Potential users of Analyst’s Notebook such as analysts and investigators who want information about Analyst’s Notebook and the potential benefits it provides
- System administrators who wish to gain a high level understanding of the product and system prerequisites that are needed to install and run the application.

This document relates to Analyst’s Notebook version 8.0

Please see the What’s New in Analyst’s Notebook 8.5 whitepaper for additional information on product features and capabilities.

Potential benefits of Analyst’s Notebook

Provides a rich and powerful range of assisted analysis and visualization capabilities

Analyst’s Notebook provides a powerful set of assisted analysis and visualization capabilities that are designed to help analysts quickly deliver high value intelligence from ever growing data sets. Analyst’s Notebook can help users to:

- Quickly identify patterns in data that might otherwise be missed using single analytical approaches
 - Reduce the time to deliver rich, actionable intelligence.
 - Increase the depth of intelligence for more effective resource utilization.
-

“Analyst’s Notebook supports the dynamic human thought process and offers unparalleled visual analytics.”

Supports the dynamic thought processes of analysts

- Flexible data model does not constrain the input of complex relational data
- Flexible data acquisition via intuitive drag and drop, importing or multiple database access capabilities
- Save time with powerful intelligent semantic searching and matching to simplify the analysis of data from disparate data sources.

Designed to provide a flexible, low-cost deployment model

- Reduce start-up costs and total cost of ownership for comprehensive assisted analysis and visualization capabilities
- Designed to support desktop-to-enterprise deployments with easy upgrade paths to wider IBM i2 solution capabilities
- ‘Out-of-the Box’ experience with the ability to customize or add-on as required
- Designed for ease of use to facilitate product familiarization and decrease training costs with standard Windows-based application and intuitive task-based user interface.

Proven worldwide assisted analysis and visualization solution

- Harness the experiences of over 2,500 organizations worldwide
- Comprehensive support infrastructure for global organizations with national language versions available in 16 languages
- Access to the worldwide user community through regular user groups and on-line forums
- Helps to optimize analytical output with solutions that have been proven worldwide in real operational environments.

Functionality overview

Flexible data acquisition

Data can be rapidly created in an Analyst's Notebook chart via intuitive drag and drop functionality, the visual importer or from multiple databases with IBM's automated data acquisition products.

Charts can be quickly generated by dragging and dropping data in the form of entities, links and attributes onto the chart. Volume data can be imported from structured data files via the wizard-style Visual Importer which creates Import Specifications that can be saved to greatly reduce the time taken to import additional information into a chart.

The potential benefits of Analyst's Notebook can be enhanced by combining it with other capabilities from the IBM® i2® Analysis product line, such as the IBM® i2® iBase data repository and automated data acquisition products such as IBM® i2® iBridge and IBM® i2® Information Exchange for Analysis Search for Analyst's Notebook.

“Powerful intelligent semantic searching and matching capabilities help analysts search, match and analyze data from disparate data sources.”

Flexible data model

Analyst's Notebook provides a flexible data model that does not constrain the input of complex relational data. The data visualization environment allows users to represent information in a variety of forms including link, network or timeline charts. Items can be represented as entities, links, events, timelines or attributes in order to best present the type of data and allow more effective analysis and visualization of a wide range of data sets including social networks, telephone records, financial transactions and internet traffic records to name but a few.

The intelligent semantic searching and matching capabilities help analysts reduce time spent search for data by initiating “analyst-like” data collation techniques and applying data quality control processes to help overcome the challenges of identifying non-obvious duplicates.

Powerful analytical capabilities

Analyst's Notebook delivers a powerful range of analytical tools that can help analysts quickly convert large volumes of data into high value intelligence.

The wide range of analytical tools can help analysts to quickly analyze large data sets by providing multiple analytical views including association, temporal, spatial, statistical and spreadsheet views.

New capabilities such as Dynamic Filtering, Social Network Analysis, Mapping and Conditional Formatting further strengthen the range of analytical tools available to analysts within Analyst's Notebook. Other available capabilities include List Items, Entity Matching, Visual Search, Find Path, Find Linked and Cluster Analysis.

Simple communication of complex data

Analyst's Notebook provides the means to communicate complex data with intuitive and easy-to-follow briefing charts and reports that capture and organize supporting data for briefing and presentation purposes.

Analyst's Notebook charts can also be shared electronically to those without access to Analyst's Notebook. IBM® i2® Chart Reader is available at no charge and provides read-only access to charts which can then be navigated, searched or printed. Rich information behind chart entities and links can also be searched and read.

Key features of Analyst's Notebook

Task Based User Interface

Analyst's Notebook provides an intuitive task based user interface where individual Analyst's Notebook functions are grouped together in common task categories.

The screenshot below highlights the Task Pane in Analyst's Notebook. Each task category contains the Analyst's Notebook functionality relevant to that task. These task categories help Analyst's Notebook users to create charts, analyze charts and prepare charts for distribution.

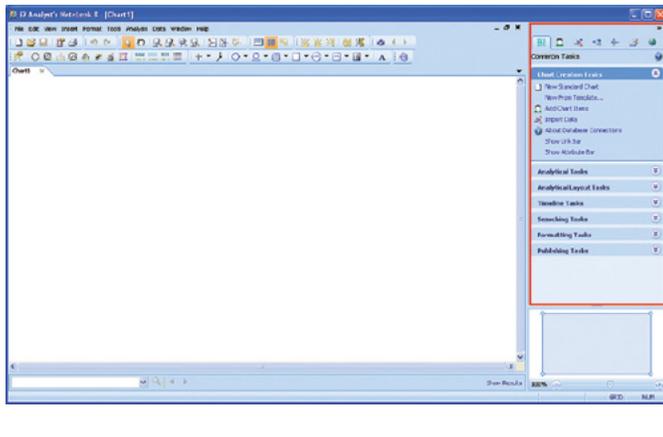
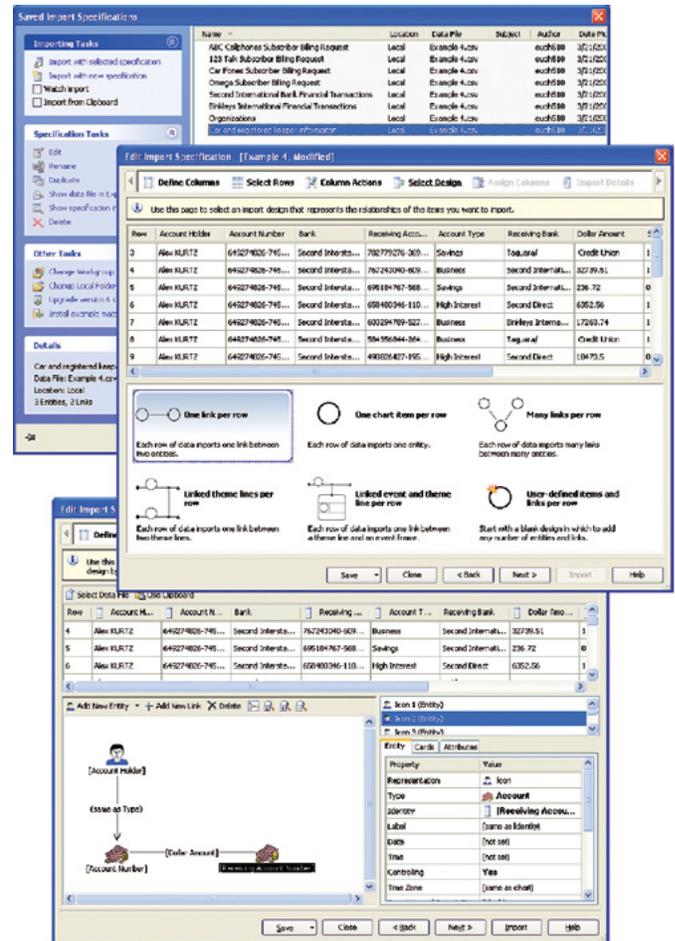


Figure 1: The Task Pane also includes quick access, via the tabs at the top of the Task Pane, to the most commonly used Analyst's Notebook functions

Importing

Analyst's Notebook helps enable you to automatically generate charts by importing data from source data files or from data held in the clipboard. An import specification is required, for each import, to instruct Analyst's Notebook how to convert the data into chart items. An import specification tells Analyst's Notebook how the data in the source file or clipboard should be interpreted, which items of data should be used for the entities and links, which additional data, not in the source file or clipboard, should be added to the chart, as cards, attributes, and how the resulting chart should be laid out.



Importing data will involve either creating a new specification based on a given data source, or running an existing specification with a compatible data source. The Import Editor and Import Manager are used for these tasks.

Databases and data sources

The potential benefits of Analyst's Notebook can be enhanced by combining it with other capabilities from the IBM i2 Analysis product line, such as the iBase data repository and automated data acquisition products such as iBridge and iXa Search AN which are designed to allow the automatic connection to one or more of your existing data sources.

By integrating these powerful data acquisition products, data access configurations can create live connections between your existing databases and Analyst's Notebook. This smooth integration gives analysts the ability to retrieve and analyze information stored in multiple, standard relational databases. With live data access, you can use Analyst's Notebook to more quickly retrieve vital information from your databases without relying on a database specialist or learning a complex query language, confirming that your analysis is based on the most up-to-date information available.

iBase

iBase is a sophisticated database solution for capturing, controlling and analyzing multi-source data in a security-rich environment.

“Analyst's Notebook can be upgraded to allow connectivity to one or more of your existing data sources.”

Information Exchange for Analysis Search Services SDK

IBM® i2® Information Exchange for Analysis Search Services for Analyst's Notebook is an innovative information sharing and search solution that designed to increase analytical productivity by automating and accelerating the lengthy research process of capturing, enriching and collating data.

In one click, users can gather data from multiple sources and locations, enrich, collate and process the data to quickly begin analyzing.

In seconds, iXa Search Service SDK logs in to local or global data sources, initiates intelligent searches to automate “analyst-like” data collation techniques, applies data quality control processes to help overcome the challenges of identifying non-obvious duplicates, and provides near immediate access to results ranked by accuracy; all from within Analyst's Notebook.

iBridge

iBridge is an advanced analysis and connectivity solution that creates live connections to multiple databases throughout your organization. It helps confirm that your analysis is based on the most up-to-date information available by creating live connections between your databases and Analyst's Notebook.

Rapid Chart Creation

Accessed via the Task Pane is the Add Chart Items option which is designed to allow rapid chart item creation and editing capabilities. This function provides an intuitive drag and drop interface to quickly build chart data.

The Add Chart Items Task Pane displays icon, link and attribute palettes and can be configured to display items in a number of different modes such as:



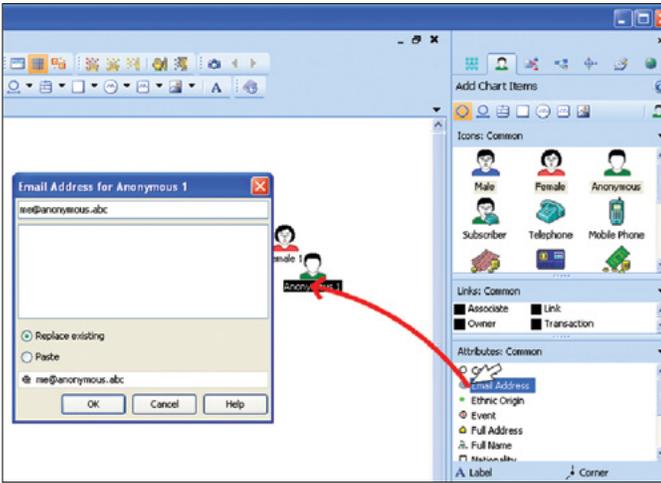
- **Search** – Provides search capabilities for the Analyst's Notebook palettes. Search for and display items based on name match or by semantic match
- **Display Individual Palettes** – Individual palettes can be displayed as per previous versions of Analyst's Notebook.
- **Recently Used** – Displays the most recently used items.
- **Most Popular** – Displays the most used items
- **Currently On Chart** – Displays only items that are on the chart. This allows a simple and fast method to understand what items are contained within a chart you have just received
- **Relevant to Selection** – When selecting an item on the chart only items relevant to the type selected will be displayed
- **Entity Types** – Displays a dialogue that lists all the items in all palettes. You can search and select an item within this dialog to add to the chart.

Attributes

Attributes allow you to indicate on your chart that some items share common characteristics. For example you may use attributes to display the nationality of any people on your chart, or the color of vehicles. You can use symbols to indicate a characteristic and also add textual or numeric values.

You can add attributes to entities and links. An attribute is a marker that is placed below entities or links to indicate additional information or common features. Attributes have a symbol and a value.

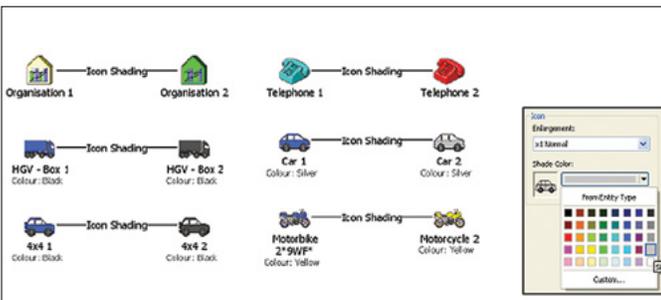
When adding attributes, you are presented with a dialog in which you can enter data manually or choose from a list of options. Also, you can select a single attribute to add to multiple items in one operation.



Icon Shading

The shading color is used to set the dominant color of the icon selected for an entity type. For people type entity types the dominant color is the skin color, and for vehicle type entity types the dominant color is the vehicle body, and so on. A sample window shows you the effect of changing the shading color on the icon.

You can change the shading color on icons; however, it is inadvisable to change the shading for flag icons, where the original colors may need to be preserved.



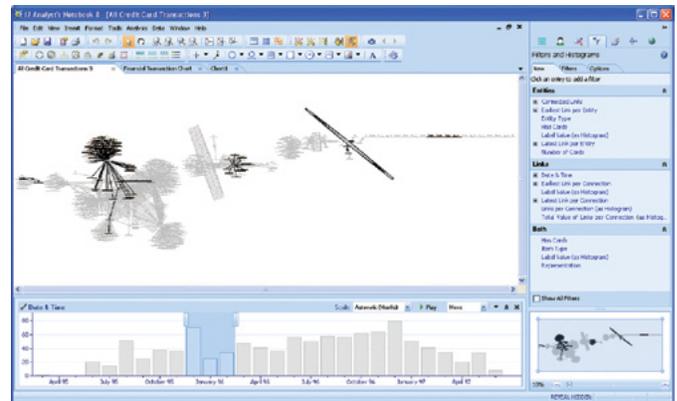
Dynamic Filtering

The new Dynamic Filtering functionality in Analyst's Notebook provides an instant visual view of your chart, based on property types contained within the chart data set, in the form of statistical bar graphs (list view) or histograms. The interactive list and histogram views then allow you to select information of relevance and filter out non-relevant information, either by hiding or graying out items that do not pass the filter criteria. Multiple filters can also be applied to quickly and efficiently narrow down large data sets and identify possible high value intelligence.

The Dynamic Filtering display, when open, automatically parses the chart data and presents filters for only properties that are present in the data. These lists are then dynamically updated as new information is added to the chart.

Histogram View Filtering

Histogram filters provide a powerful mechanism in quickly delivering visual feedback for a range of data types contained with any chart. Highly suitable for range based data types



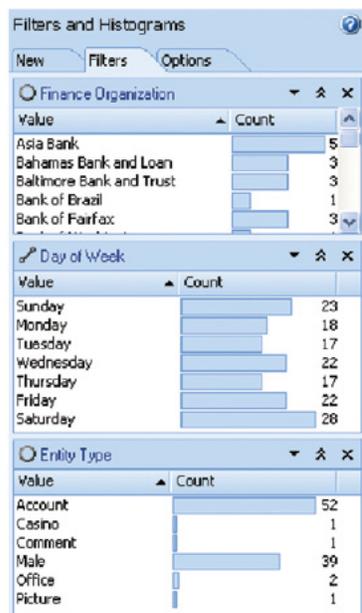
such as date/time or transactional amounts, the interactive Histogram View quickly allows you to identify areas of interest in a chart data set such as peaks, troughs or patterns in activities and drill down in these areas of interest to quickly highlight the relevant data contained in the chart.

The interactive Histogram view provides the following capabilities:

- Select bars (single or multiple selections can be made) in the histogram view to highlight the corresponding items within the main chart view
- Drill down to perform more detailed analysis of a data set to, either, provide a more granular view of the entire data set (view by days instead of months for example) or to display the information for a selected range only (view only the items in June for example)
- Run an animation of your chart data to show how, for example, activities occur over time or how a chart builds over time
- Copy the histogram view as a bitmap to allow easier integration into reports or presentations.

List View Filtering

List view filters provide instant visual feedback based on the property contained with a chart data set. This statistical summary can be provided for anything from Entity types through to user and analysis attributes and offers instant insight into the information contained in a chart. Data in the list views can also be sorted to help in more easily identifying areas of interest.



Multiple list view filters can be used to quickly identify information in a chart data set based on complex filter criteria.

Filters can be applied to just entities or to just links or where applicable to both.

Social Network Analysis

Social Network Analysis (SNA) allows users to explore group dynamics within a network chart by focusing on the relationships that exist between entities. Identifying these key entities and how information may flow through a network can be quickly achieved using standard SNA centrality measures such as Betweenness (Number of paths passing through each entity), Closeness (Proximity of an entity to others within the network) and Degree (Number of direct links). These measures allow potential key individuals within a target network to be quickly identified.

The SNA centrality measures that are included in Analyst's Notebook are:

- **Degree Centrality** - Identifies entities who may be the most active in a network based on the number of direct links to other entities
- **Closeness Centrality** - Identifies entities who may have the best access to other parts of a network and visibility of activities within the rest of a network
- **Betweenness Centrality** - Identifies entities who may act as gatekeepers or bridges of information and may control information flow between different parts of a network.

SNA can also be enhanced by the use of weightings to indicate the strength of differing relationships (links), each of which has an effect on a target network. This helps to deliver a more real-world indication of the dynamics and structure of a given target network.

In Analyst's Notebook weightings can be set on a chart by chart basis manually, or can be implemented with the use of a pre-configured weightings file.

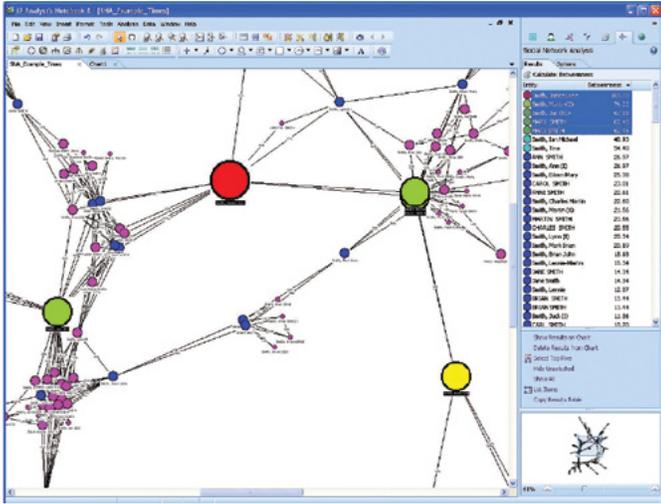


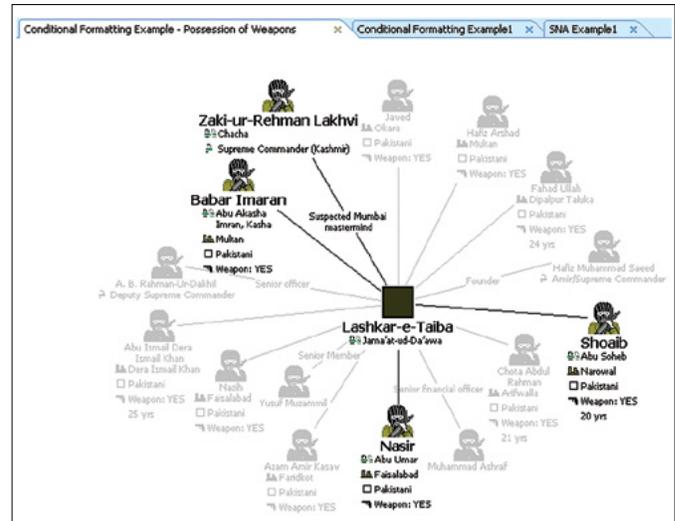
Figure 2: Conditional Formatting specifications can also be run on completion of SNA calculations to aid visualization of the SNA results. The screenshot above shows how the use of conditional formatting can help to easily visualize who and where potential key individuals are placed in a network and how a network is structured

Conditional formatting

Conditional formatting allows users to define a set of rules that automate the process of formatting chart data to emphasize significant information for analysis or presentation purposes. Rules can also be saved so that repetitive tasks that are required across many charts can be automated.

Multiple rules can be set up in Conditional Formatting specifications to perform complex formatting tasks based on properties contained within chart entities, links and attributes. As with Import specifications, the Conditional Formatting specifications can be saved either locally or in a workgroup, providing organizations an effective method of standardizing the format of charts for reporting and presentation purposes, for example.

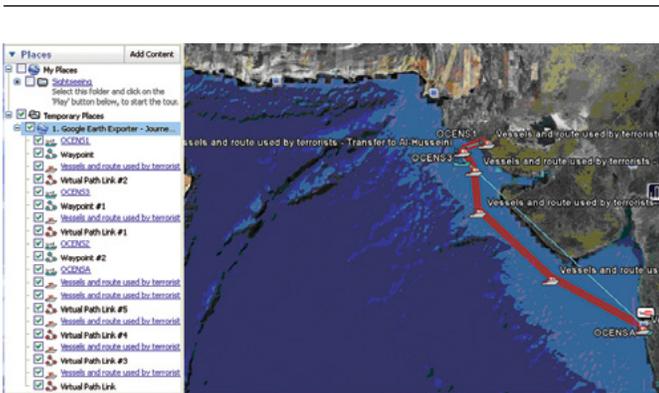
For example, you may wish to create a rule that enables you to highlight entities that have an alias attribute by creating a rule that grays out entities that don't possess that particular attribute. An example of the effect of such a rule can be seen below.



Map Chart Items

If items in a chart contain geographical information, Analyst's Notebook can identify and map this information to Google Earth. Date and time information can also be sent to Google Earth so the user can use the time slider animation within Google Earth to track the movement of suspects or events over time.

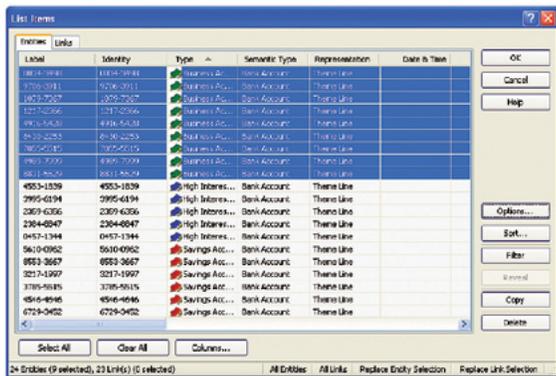
Chart items can be selected within Analyst's Notebook and, either, sent directly to Google Earth or exported to a kml/kmz file, a mapping file format that can be imported in to other common mapping applications.



List Items

List items is an analytical tool which allows the user to display the links and entities on a chart in tabular form. Sorting the records is one of the particularly useful features provided by list items.

It is also a good method for selecting specific groups of chart items.

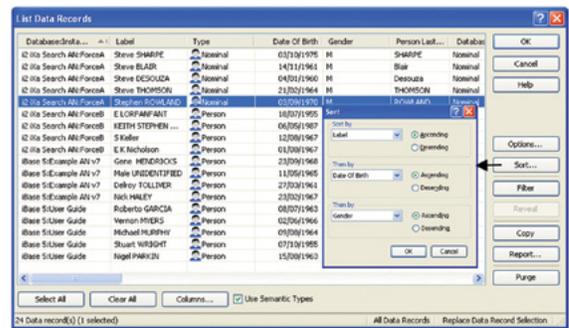


List Data Records

Entities and links that are created in a database, such as an iBase database, will have records of information defined for them. When the database entities and links are transferred to Analyst's Notebook, these records are held for each chart item as data records.

Use List Data Records to list the data records held for the entities and links on your chart, so that you can view, sort and select items according to the information held in their records.

Although you can view the data records for individual chart items by displaying the Data Records page of the Edit Item Properties dialog, the List Data Records dialog enables you to view all of the data records in your chart in one place, so that you can make comparisons between them.



Entity Matching

Entity matching is the process of finding occurrences of entities on your chart that may represent the same information. Analyst's Notebook provides two types of entity matching:

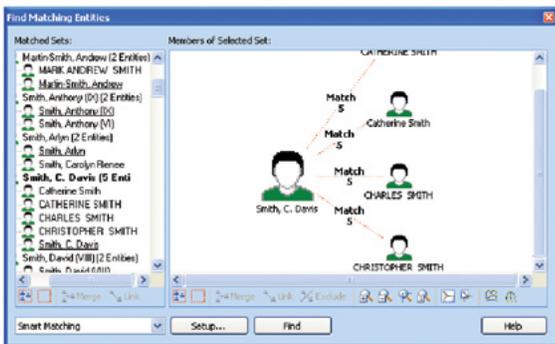
Automatic entity matching

Analyst's Notebook automatically detects entities that are the same as other entities as they are being pasted or imported into a chart on the basis of their identity or database identity. The identities of two entities are deemed to be the same if they match exactly (and are the same case) character for character. As two identical entities are not allowed to coexist on the same chart, Analyst's Notebook merges them together, even if their labels are not the same.

Find Matching Entities

Situations may arise where you paste or import chart items into your chart that have equivalent labels, properties, or semantic types but have different or blank identities. Entities whose names appear to be the same on the chart must have different identities otherwise they cannot coexist because of automatic entity matching.

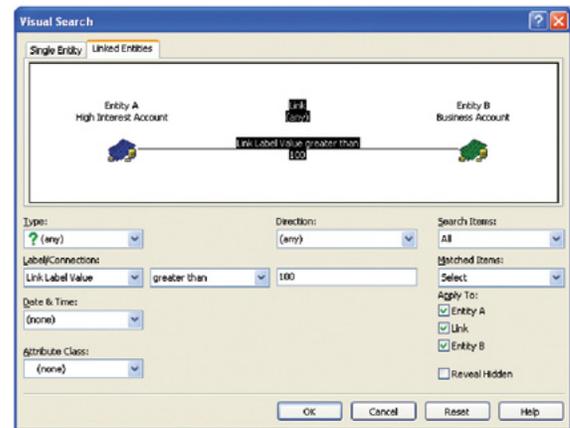
It is possible that such instances represent the same real-world entity. There are numerous situations where this can occur and you can use Find Matching Entities to identify and then manage what are really several instances of the same entity.



Visual Search

Use Visual Search to find items on your chart, based on their type, label, date and time, and attributes. Single entity searches the entities on your chart to find those that match conditions you specify.

Linked Entities searches entities that are linked to other entities to find entities and/or the links between them that match conditions you specify.



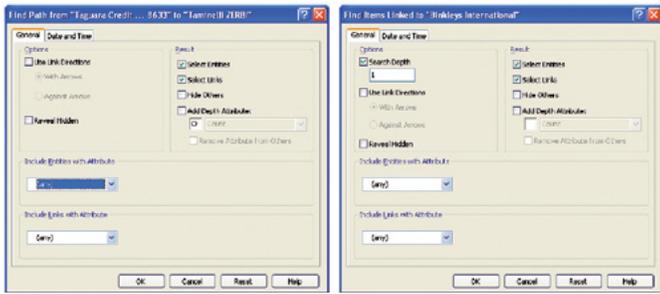
Find Path

Find Path finds paths from one item to another, based on criteria you specify. You can set various rules about which items are allowed on the path.

A path is a specific route between two items on a chart. It includes both entities and links along the route. It answers the question "How is Item A connected to Item B?"

Find Linked

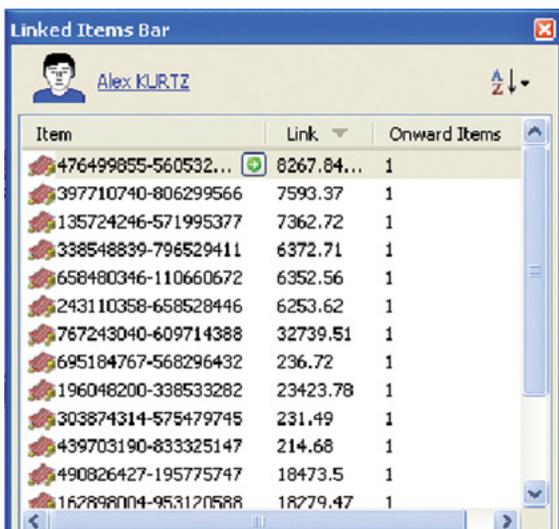
Find Linked extends the current selection of items on the chart to include entities linked to the selection and, optionally, the links between them. You can set various rules about which items are selected.



Linked Items Bar

The Linked Items Bar is an analysis tool that can help you discover the chart items that are connected to a selected entity. In small charts that have been created manually, it is simple to see which chart items are linked to a particular entity. However, in very large charts, such as a chart created by importing data from a telephone call log, it is very difficult to see each of the linked chart items as a separate group without manipulating the chart in some way.

The Linked Items Bar is designed to provide a quick summary of each of the connections for a selected entity, and as it can be docked at the side of the chart, you can click on the entities of interest and view their connections in the docked window without modifying the chart.



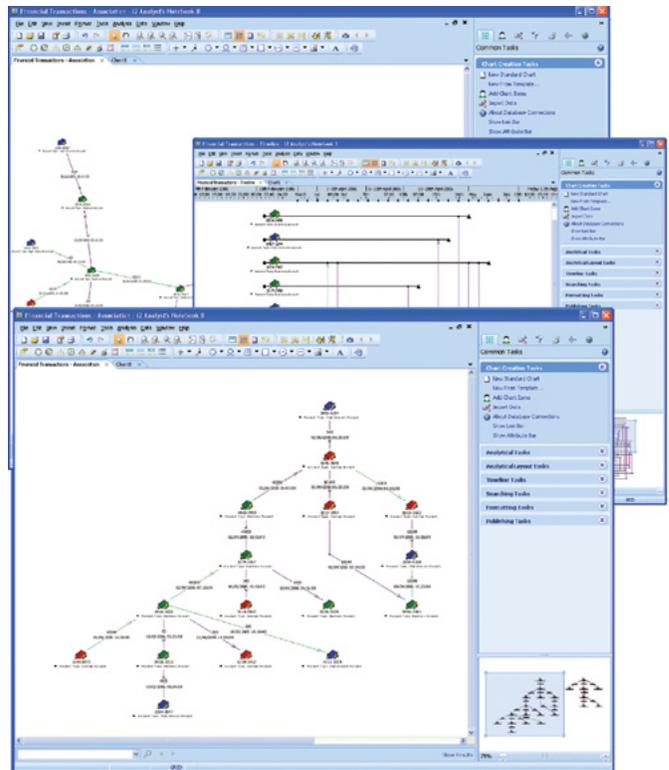
Layouts

Layouts provide a quick way of automatically rearranging the entities and links on your chart to improve the appearance of your chart and to help you analyze the structure of chart data.

When applying a layout, Analyst's Notebook does not change the zoom level. Your chart view remains at the same place and level of zoom as it was before applying the layout. This may mean that after applying a layout you may need to adjust your view.

Analyst's Notebook provides two main types of layout, depending on what kind of data your chart contains layouts for association charts and layouts for timeline charts.

For a new chart, it is often a good idea to apply several different types of layout, to determine which provides the most revealing view of the data in your particular investigation. Having identified a layout, you can then try experimenting with the settings for this layout for even better results.



Intuitive Chart Navigation – Pan, Zoom and Chart Overview

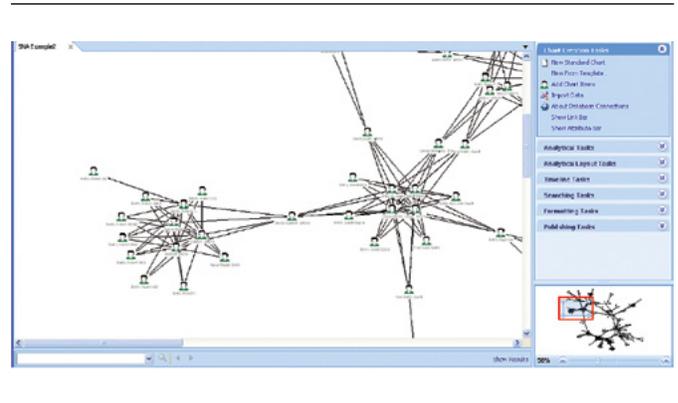
Chart navigation within Analyst's Notebook has been made easier with the Grab Hand mode and a Chart Overview window.

Grab hand mode provides an intuitive method of navigating around charts delivering the same capability associated with common commercial software packages such as Google Maps.

The interactive Chart Overview window provides a view of where you are within a chart when zoomed in, in the main chart area. This helps to ensure that you know where you are in your chart when zoomed in and makes it easier to navigate around charts, particularly larger charts.

Providing interactive control, with the Chart Overview window you can:

- Click on virtually any point in the chart overview to move the main chart area to that point in the chart
- Left mouse click when the pointer is within the blue position highlight box and drag to move to a new point in the chart.
- Left mouse click when the pointer is outside the blue position highlight box to create a new position highlight box
- Use the zoom control bar at the bottom of the Chart Overview window to control the zoom level of the main chart area.



Technical description

Product architecture

Analyst's Notebook is a standalone desktop product designed to provide users with a powerful visualization and analytical tool.

Analyst's Notebook has an API to enable programmatic control of the application via the IBM® i2® Analyst's Notebook® SDK.

What documentation is provided?

The documentation supplied with Analyst's Notebook is as follows:

- Analyst's Notebook Quick Start Guide
- Analyst's Notebook Release Notes
- Analyst's Notebook Online Help

The documentation (other than the on-line help) is provided in electronic form only. In order to display the documentation a PDF viewer must be present on the installation system.

Is Analyst's Notebook available in languages other than English?

Analyst's Notebook is developed in US English. It is supported on Western Europe, US, Central European, Baltic, Cyrillic, Turkic, Arabic, Japanese, Simplified Chinese and Traditional Chinese regional versions of the supported operating systems.

For more details on the availability of national language versions please contact your regional sales representative.

How does Analyst's Notebook integrate with other IBM i2 products?

Analyst's Notebook provides a rich set of analytical and visualization capabilities.

For more information on the IBM i2 Intelligence Analysis Portfolio please visit www.i2group.com or contact your regional sales representative.

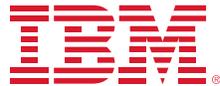
Implementation and training

IBM offers standard training courses for Analyst's Notebook. These are designed to help your staff get immediate time-saving and analytical benefits from your new system.

For more information

To learn more about IBM i2 Analyst's Notebook, please contact your IBM representative, or visit: www.ibm.com

To learn more about all of the IBM Smarter Cities solutions, visit: ibm.com/smartercities



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