

# Connecting Spotfire® to Data Sources



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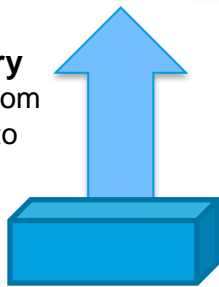
# Content

- How does Spotfire consume data / Enterprise data access
- Data access using Spotfire Information Designer

# How does Spotfire consume data?



**In-Memory**  
Load data from source in to memory



**In-Database**  
Leave data in DB  
Dynamically load and discard data to visualize



**On-Demand**  
Dynamically swap data in and out of memory.



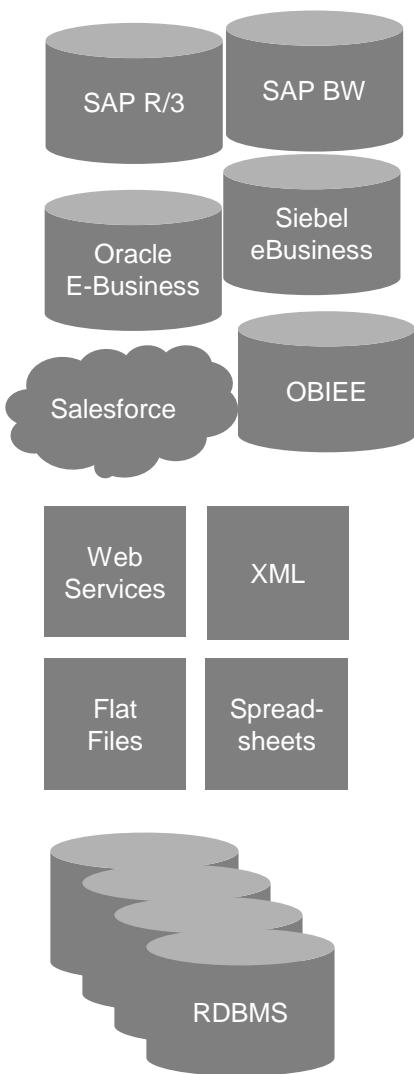
**DATA SOURCES**

- RDBMS
- Spreadsheets
- Flat Files
- XML

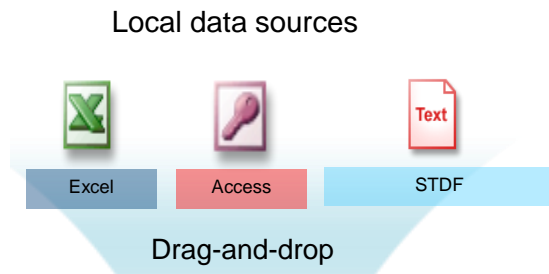
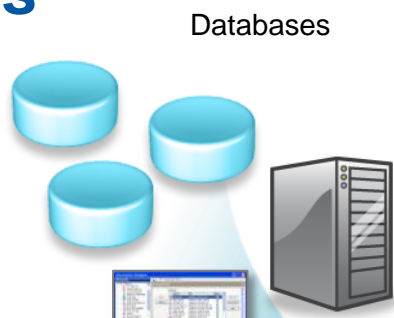
- Hadoop & Big Data stores
- Analytical DWs e.g. Exadata
- Cubes

- Event Data Streams
- Active Spaces

# Enterprise Data Access

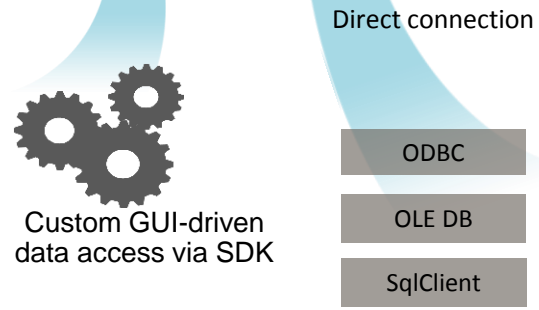


- SQL Server
- Oracle
- MySQL
- Teradata
- Netezza
- JDBC/ODBC
- Hadoop
- SFDC
- PostgreSQL
- Etc.



**Direct Query**  
(dynamically query and retrieve data for visualization and analysis)

- Databases**
- Teradata
  - Oracle
  - MySQL
  - Hadoop
  - MS SSAS
  - TeradataAster
  - Netezza
  - Etc.



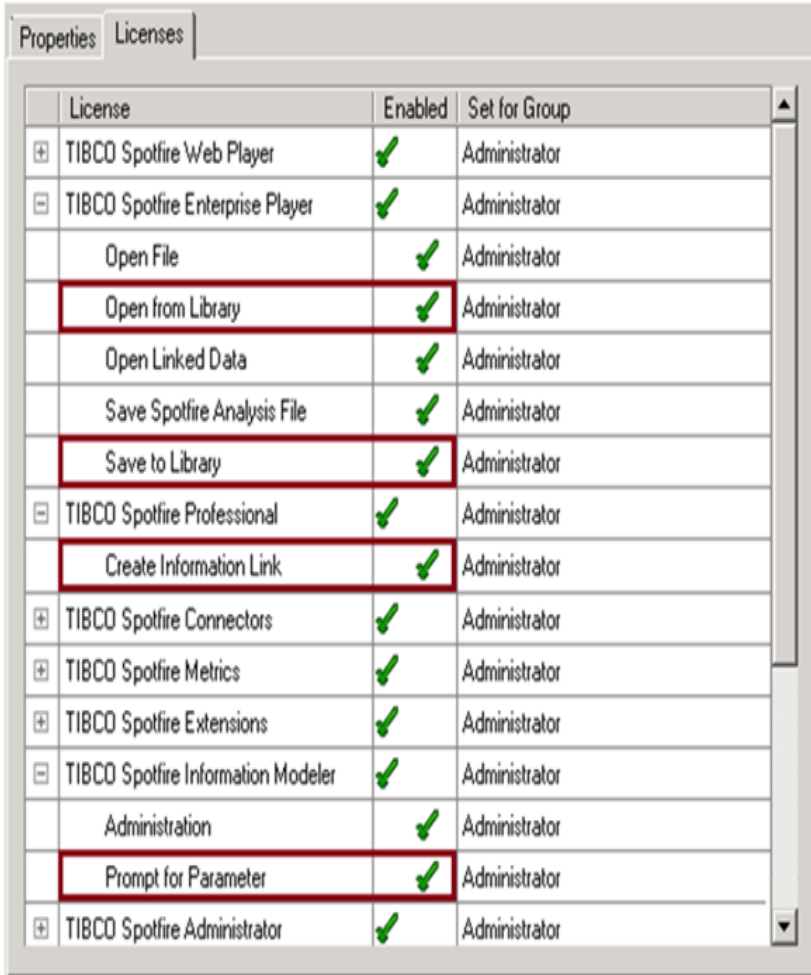
# Spotfire® Information Designer

Information Links are created within the Information Designer.

Information Designer is the tool used to manage access and connections to JDBC-accessible data sources

- Information Links are methods to communicate with a database and retrieve a specific set of data, which is then loaded directly into Spotfire.
- Information Links can include limiting options, aggregation methods, data transformations and filtering options to help control the size and specificity of the data set.
- Filters can be static or prompted

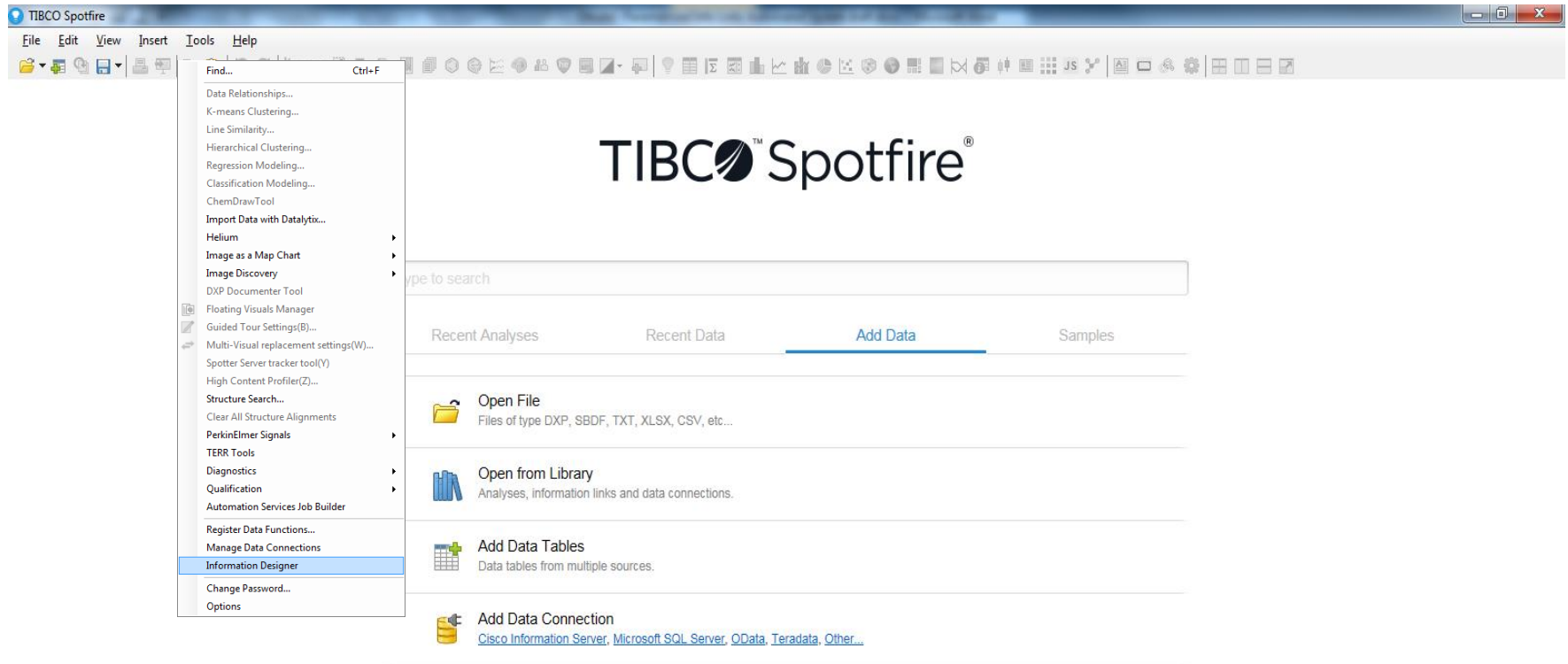
# Requirements



License	Enabled	Set for Group
TIBCO Spotfire Web Player	✓	Administrator
TIBCO Spotfire Enterprise Player	✓	Administrator
Open File	✓	Administrator
Open from Library	✓	Administrator
Open Linked Data	✓	Administrator
Save Spotfire Analysis File	✓	Administrator
Save to Library	✓	Administrator
TIBCO Spotfire Professional	✓	Administrator
Create Information Link	✓	Administrator
TIBCO Spotfire Connectors	✓	Administrator
TIBCO Spotfire Metrics	✓	Administrator
TIBCO Spotfire Extensions	✓	Administrator
TIBCO Spotfire Information Modeler	✓	Administrator
Administration	✓	Administrator
Prompt for Parameter	✓	Administrator
TIBCO Spotfire Administrator	✓	Administrator

- License options must be granted
- To set up a data source, the database must accept JDBC connections.
- A good knowledge of the underlying database structure is required

# Opening Information Designer

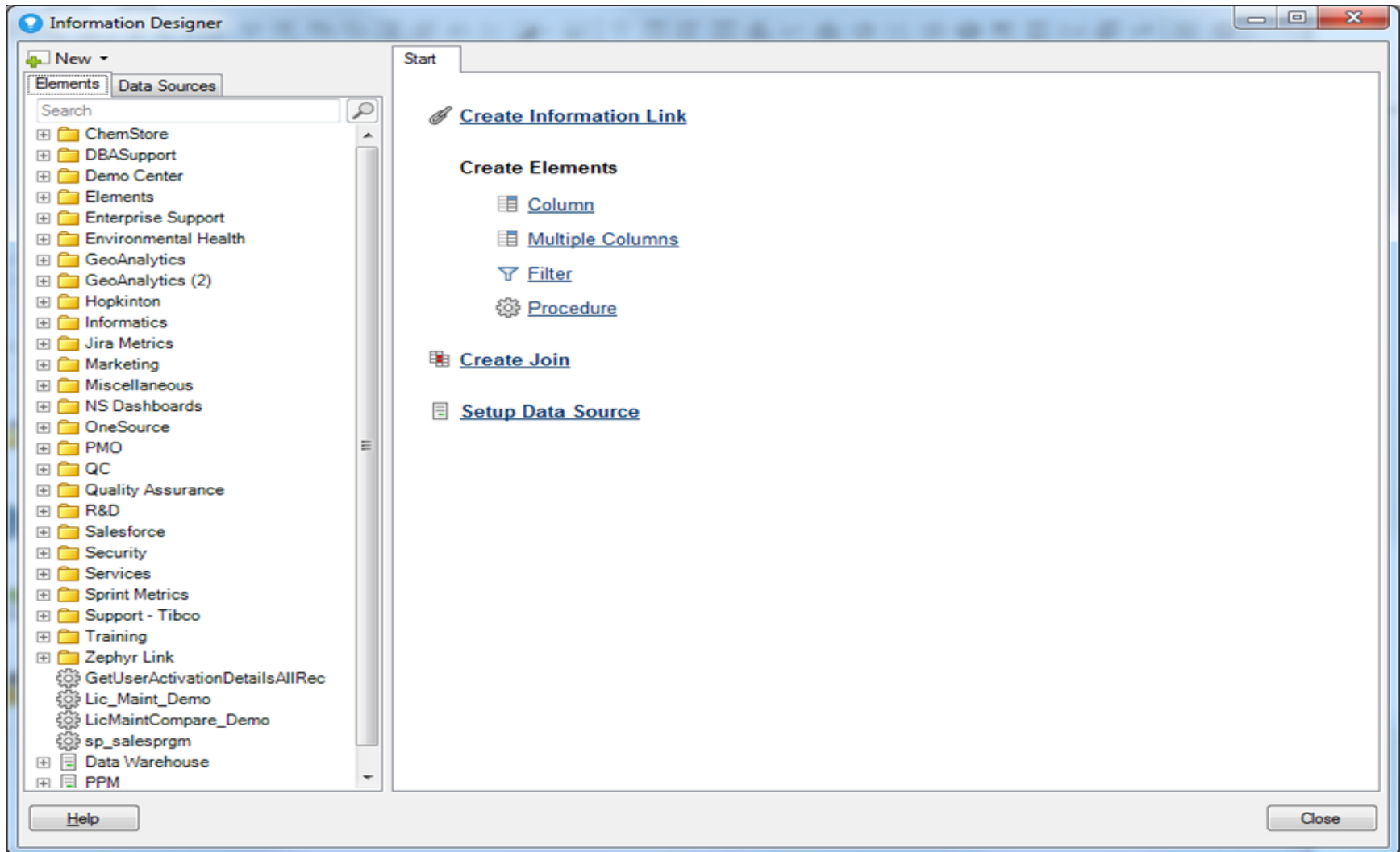


Online

No data loaded



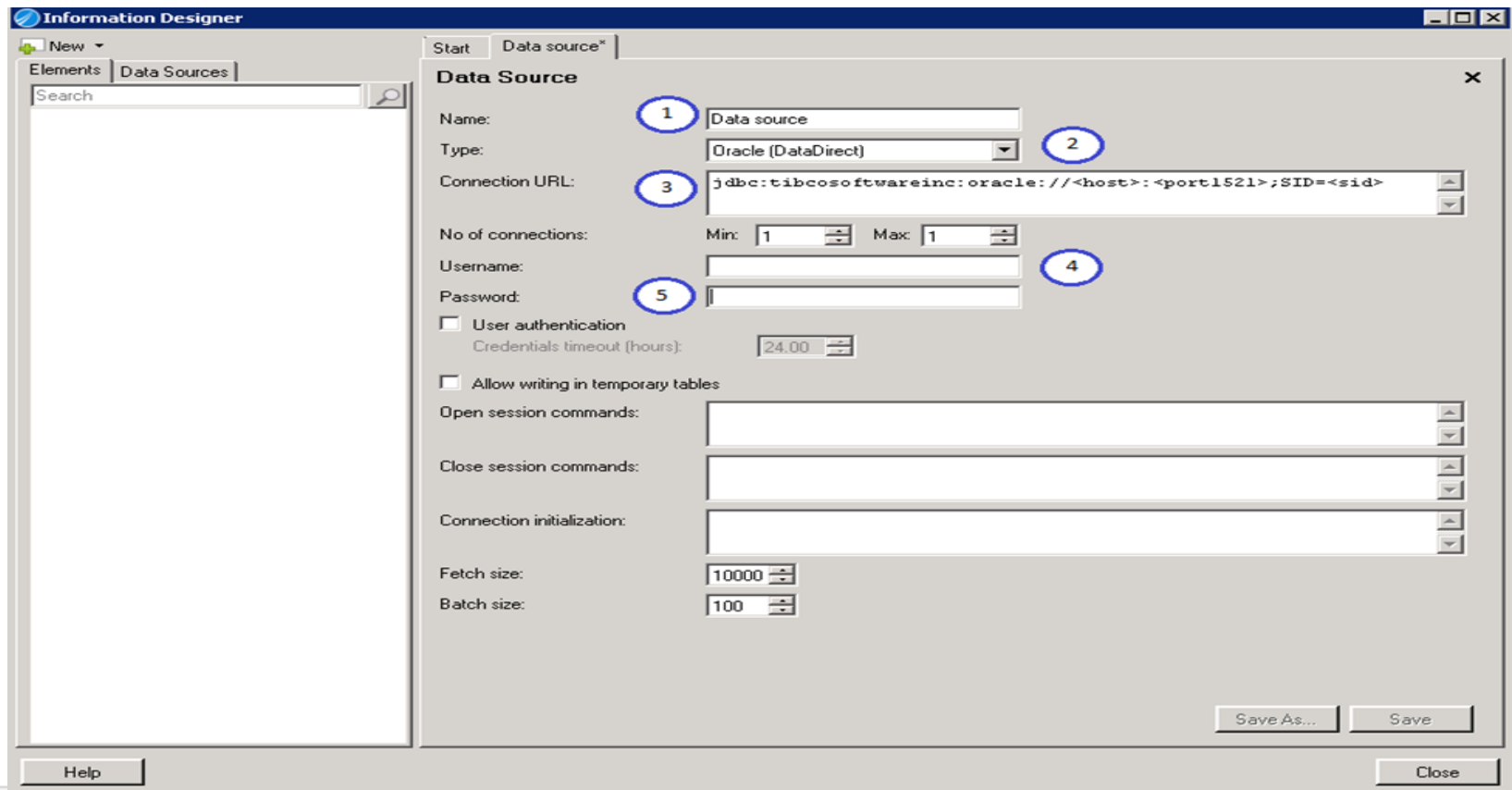
# The Interface





# Setting up a data source

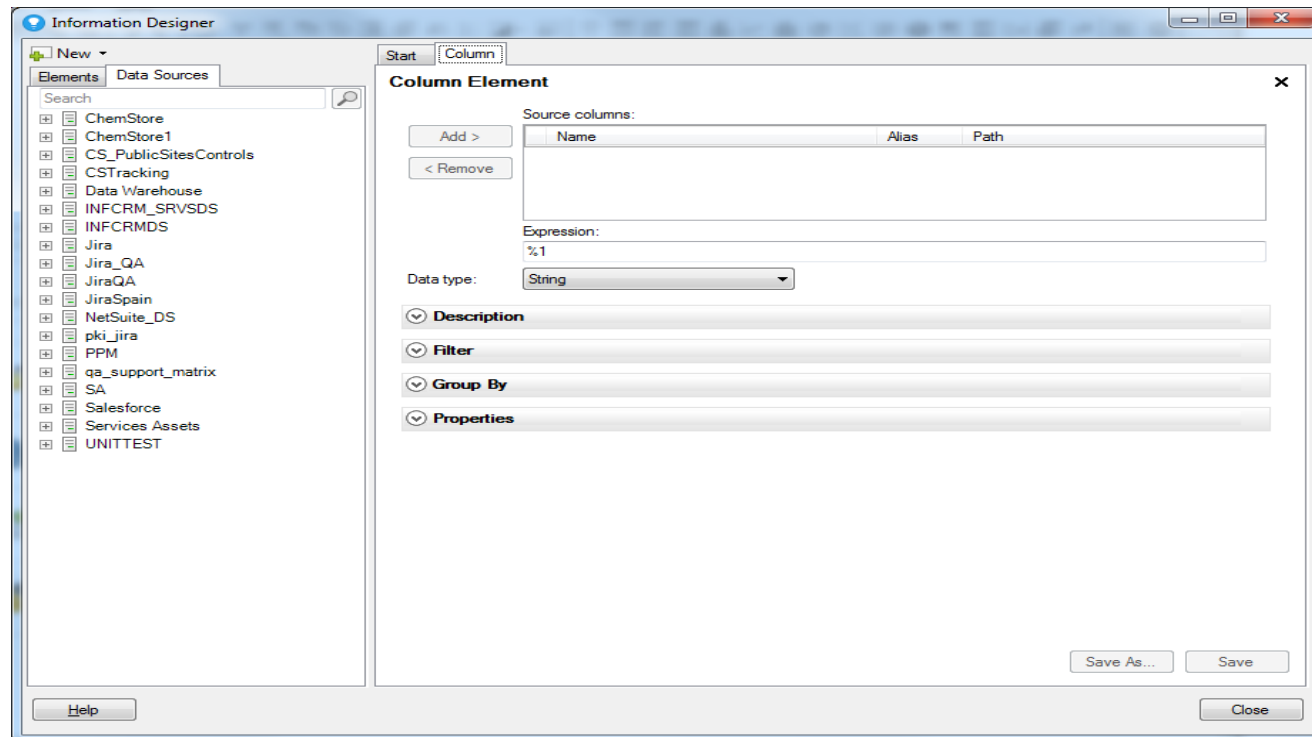
Data sources are the connections to the database. They are used to create the elements later used as columns, filters, procedures and joins.



# Creating Data Elements

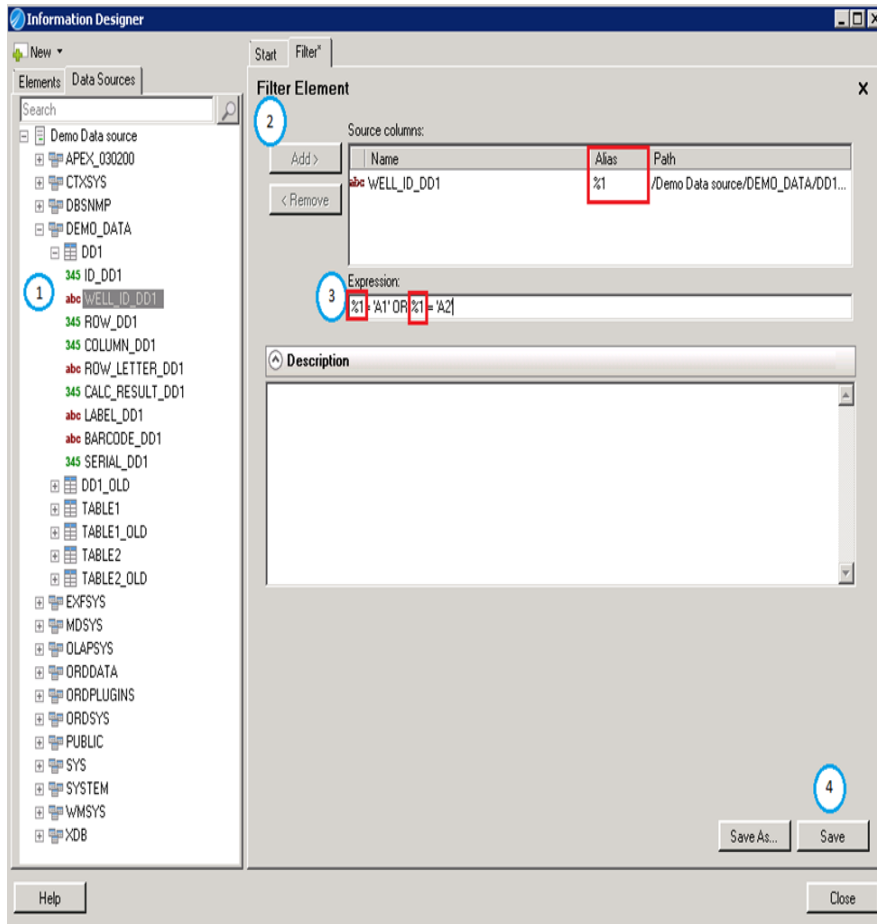


- Columns allow you to apply aggregations, filtering and grouping
- Multiple columns can be mapped quickly but do not allow the Column options



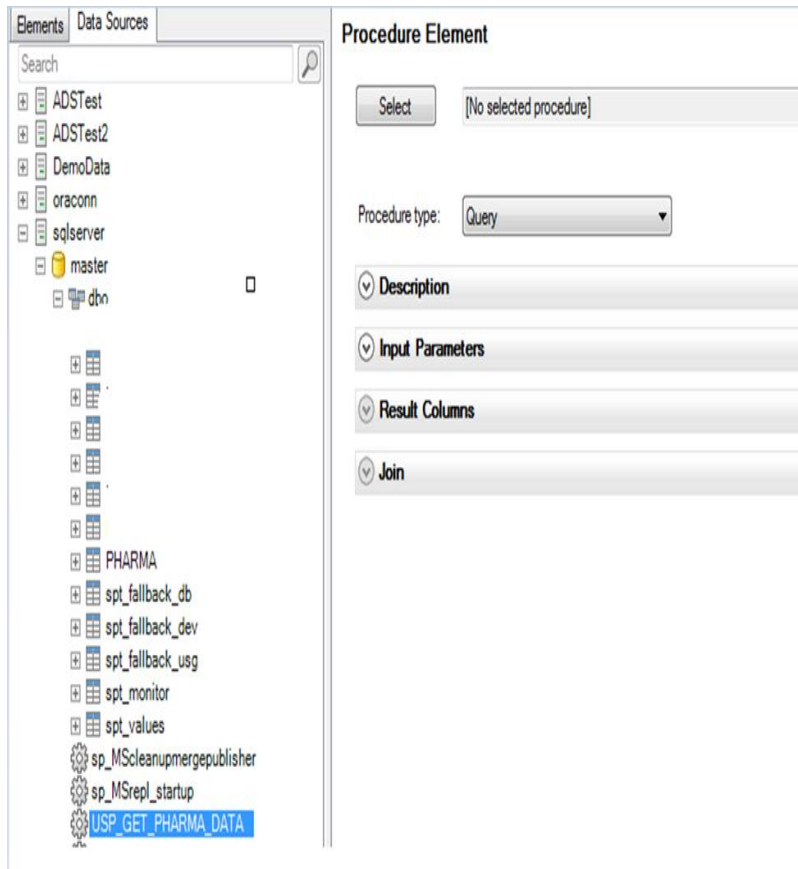
Aggregation Method	Function
MIN(%1)	Smallest figure in %1
COUNT(%1)	Number of rows in %1
CORR(%1,%2)	Coefficient of Correlation of %1 and %2
COVAR_POP(%1)	Sample Covariance of %1 and %2
STDDEV(%1)	Sample Standard Deviation of %1
VAR_POP(%1)	Population Variance in %1
VAR_SAMP(%1)	Sample Variance in %1
VARIANCE(%1)	Variance of %1

# Filters



Filters allow removal of data prior to loading based on the expression set. Remember to insert the condition in the expression field using the given column alias

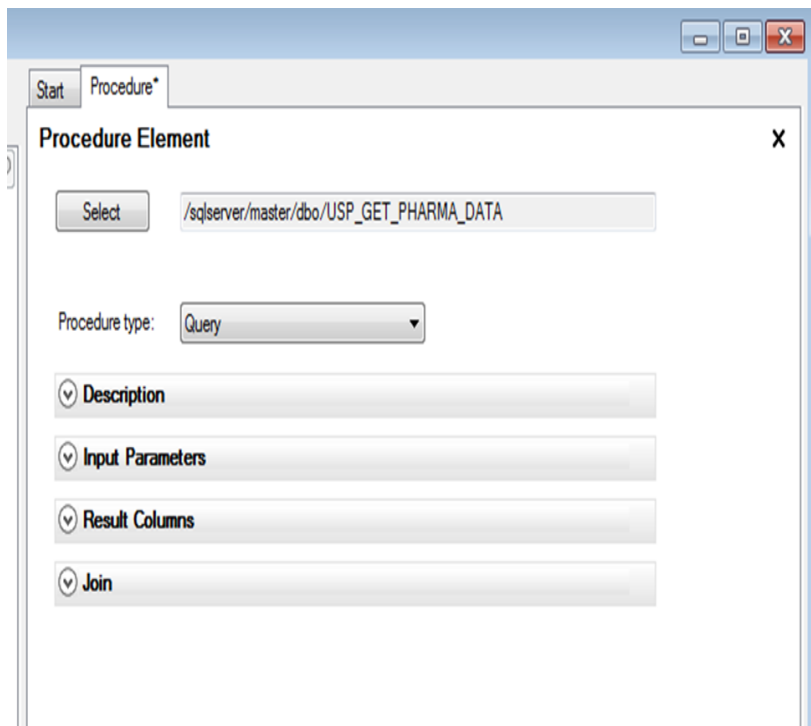
# Procedures



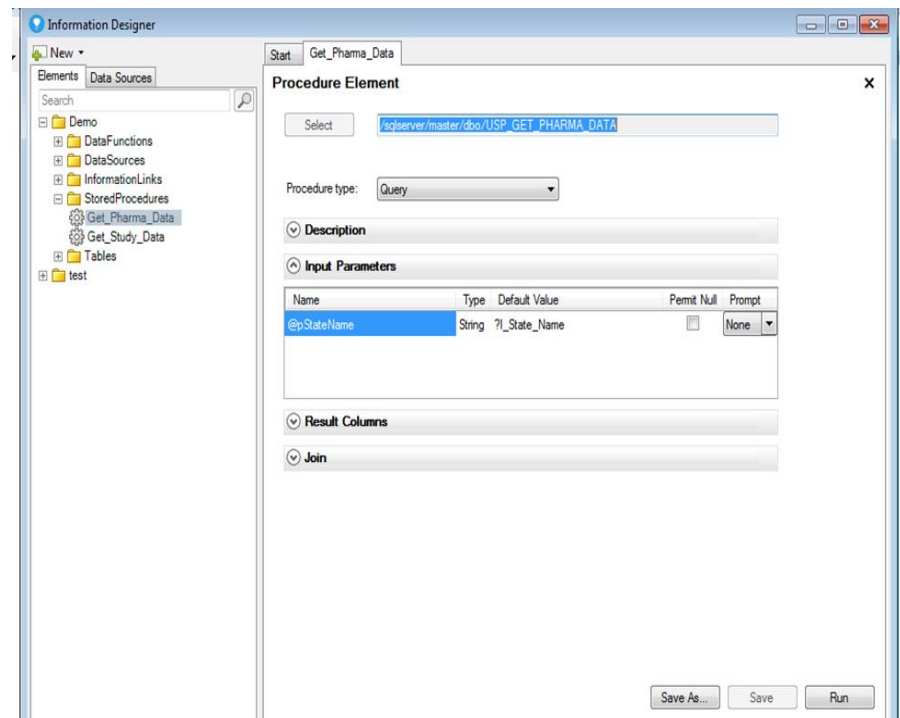
- Using Information Designer you select pre-made database procedures and configure these to be accessible in Information Links. These Information Links are available to the Spotfire users to retrieve or manipulate data.
- Parameters are variable values that must be set or passed to the Information Link when loaded. These values can change but are required when loading data. These can be defined in the Expression's fields.
- Parameters are defined following the next syntax: **"?ParameterName"**. Later, they will appear in the Parameters section after clicking **Refresh**.

# Procedures can accept input parameters and used to create Information Links

- Select Procedure of Type Query



- Provide the default value for the input parameter, either hardcoded or as a parameter indicated by “?”

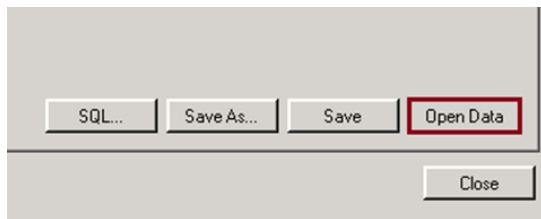
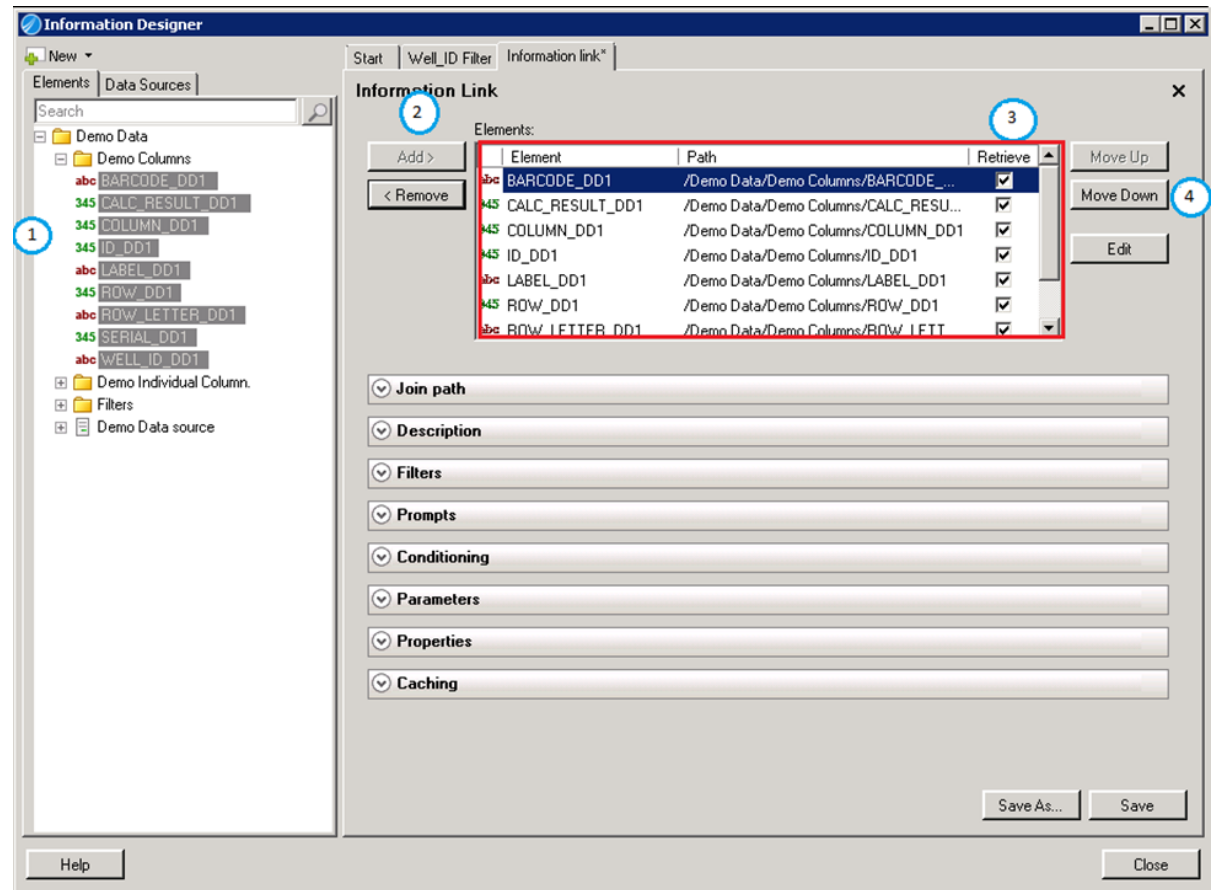


## Tip: Using the Procedure of Type “Query”

- There is a big advantage in using the ‘Procedure’ from Spotfire Information Designer for creating Information Links to load data into Spotfire Data Table. The Procedure of Type Query returns the data set with the columns specified in Stored Procedure (in SQL server database) / Stored Function (in Oracle database) code into the data table in a Spotfire analysis.
- If there are any changes needed to the table columns, joins..etc, the procedure / function code changes can be modified in the database. With the usage of Procedure element, the new columns and modified old columns in the dataset will be automatically loaded into the Spotfire data table via the Information Links. This approach will eliminate explicit changes to be made to Spotfire Information Model elements and provide easy maintenance of Spotfire IM elements.

# Create Information Links from Elements

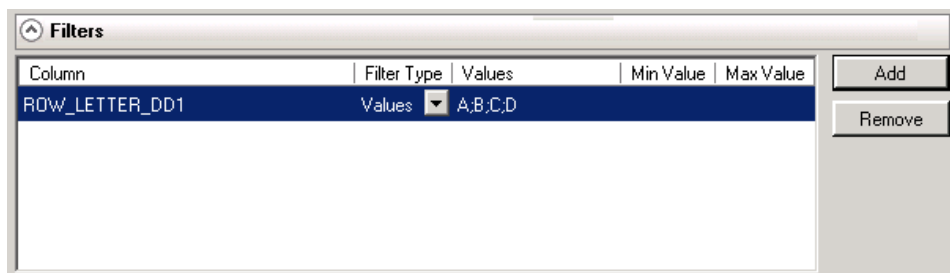
- Choose the desired Information Elements, click on “Add” and order the columns.
- Click on “Open Data” to review the data in Spotfire



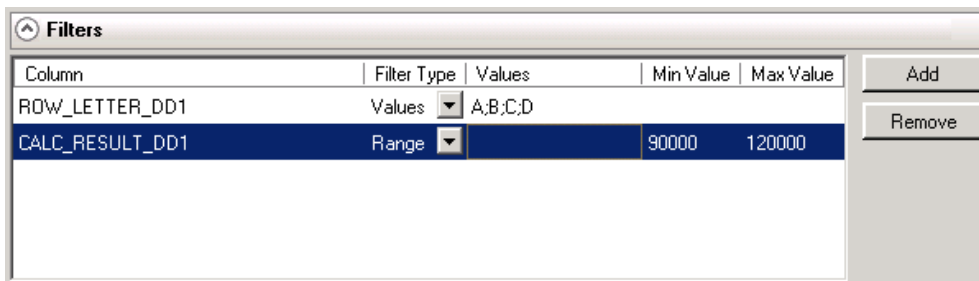


# Filter Types

- Value Filters



- Range Filters



- This filtering option can be set from the Information Link Tab. The difference between this Filter Option and the Filter Element is that the latter can be used regardless of the columns mapped in the Information Link, whereas the Filter Option must be set using an available column from the Elements box of the Information Link Tab.

# Prompts

A prompt is a dialog window where the user can choose to limit the amount of data to be loaded from the Information Link and can be changed each time the data loads

- Values
- Range
- Single Selection
- Multi Selection

Column	Prompt Type	Mandatory	Max Selections	
BARCODE_DD1	Multiple selection	<input type="checkbox"/>		<input type="button" value="Add"/> <input type="button" value="Remove"/> <input type="button" value="Move Up"/> <input type="button" value="Move Down"/> <input type="button" value="Groups..."/>

Open Information Link – Prompts Information Link Demo: Step 1 of 1

**BARCODE\_DD1**

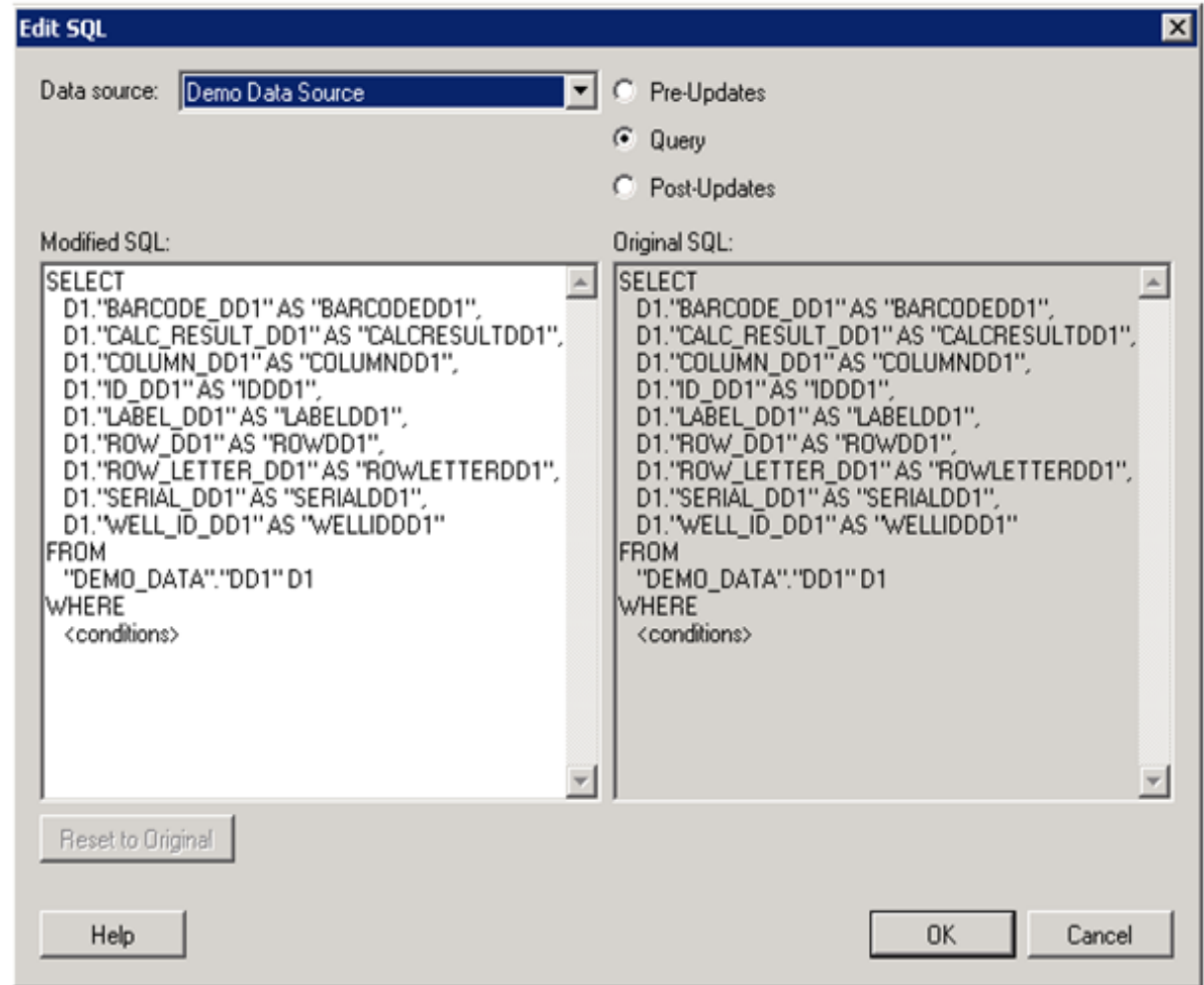
Select values:

- ESP0009125
- ESP0009126
- ESP0009127
- ESP0009128
- ESP0009129
- ESP0009130
- ESP0009131
- ESP0009132
- ESP0009133
- ESP0009134
- ESP0009135
- ESP0009136
- ESP0009137
- ESP0009138
- ESP0009139
- ESP0009140
- ESP0009145
- ESP0009146
- ESP0009147

Include empty values for this step

# SQL Button – allows you to manually edit the SQL

When using the Information Designer to create an Information Link, a SQL is being written according to the settings selected.



# Join Elements

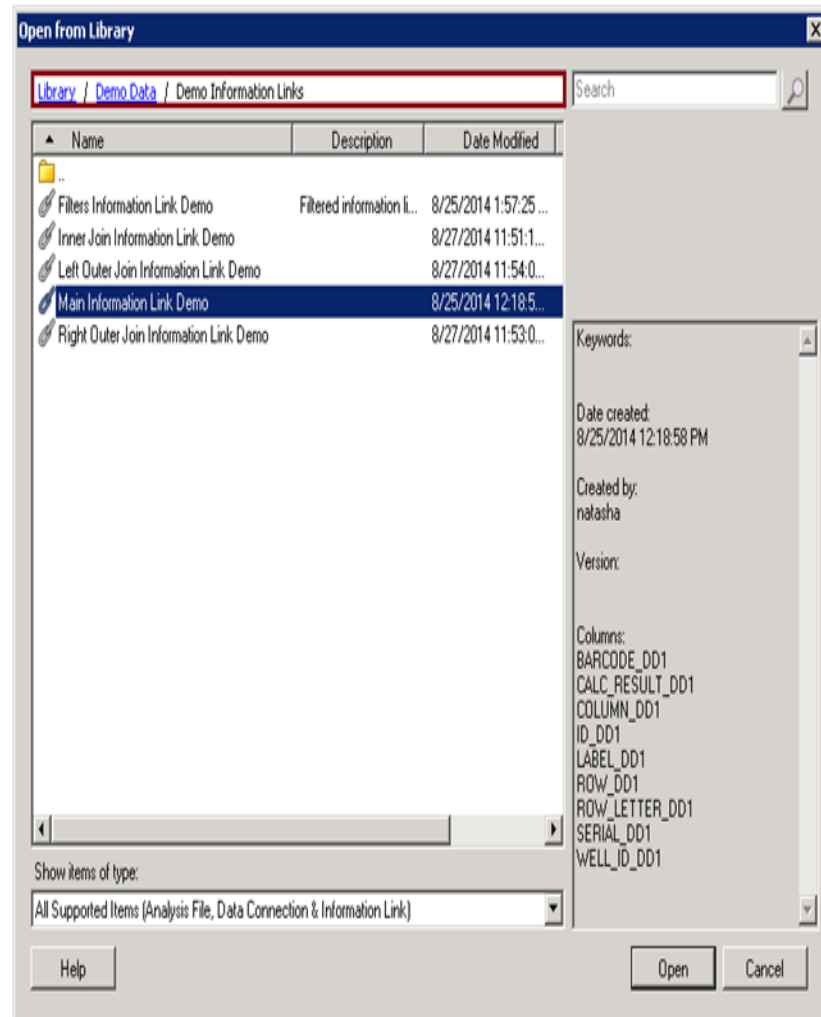
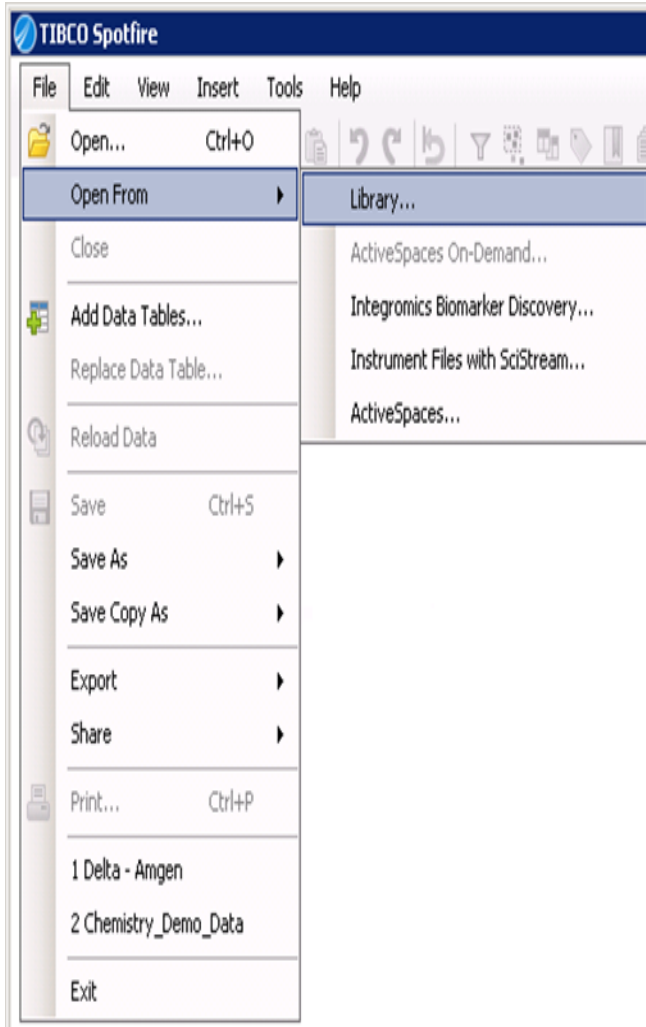
The screenshot shows the 'Join Element' dialog box in the Information Designer. The dialog is titled 'TABLE1 - TABLE2 Inner Join\*'. It contains the following elements:

- Join columns:** A table with columns 'Name', 'Alias', and 'Path'. It contains two rows, both with 'KEY' in the 'Name' column.
- Condition:** A dropdown menu set to 'Inner Join'. A list of options is visible: 'Inner Join', 'Left Outer Join', 'Right Outer Join', and 'Freehand'.
- Target tables:** Two dropdown menus showing 'TABLE1 [Demo Data Source (Oracle)]' and 'TABLE2 [Demo Data Source (Oracle)]'.
- Default join:** A checkbox labeled 'Default join' which is unchecked.
- Description:** A text field with a downward arrow icon, currently empty.
- Buttons:** 'Add >', '< Remove', 'Save As...', 'Save', and 'Close'.

Numbered callouts in the image point to: 1. The 'Elements' tree on the left; 2. The 'Add >' button; 3. The 'Condition' dropdown menu; 4. The 'Save' button.

Sometimes when creating Information Links, columns from more than one table must be used. In those cases to create a useful Information Link, a join between the tables is needed. The join relates the tables by matching data in columns that identify rows uniquely, e.g. primary key columns.

# Open and load Information from a Spotfire Session



# Data loaded

The screenshot displays a Spotfire web application interface. The main area shows a data table with 9 columns and 30 rows of data. The columns are: CALC\_RESUL..., BARCODE\_DD1, COLUMN\_DD1, ID\_DD1, LABEL\_DD1, ROW\_DD1, ROW\_LETTE..., SERIAL\_DD1, and WELL\_ID\_DD1. The data rows show values for each column, with LABEL\_DD1 values ranging from 'AlphaScreen x...' and ROW\_DD1 values ranging from 6 to 7. The interface includes a top navigation bar with a 'New visualization' button and a 'Page' tab. On the right side, there are filter panels for 'CALC\_RESULT\_DD1' and 'BARCODE\_DD1'. The 'CALC\_RESULT\_DD1' filter has a search bar and a range slider from 268 to 285700. The 'BARCODE\_DD1' filter has a search bar and a list of values including '(All) 759 values', 'ESP0009125', 'ESP0009126', 'ESP0009127', 'ESP0009128', 'ESP0009129', and 'ESP0009130'. At the bottom right, a status bar indicates '291,456 of 291,456 rows 0 marked 9 columns'. A 'Ready' indicator is visible at the bottom left.

CALC_RESUL...	BARCODE_DD1	COLUMN_DD1	ID_DD1	LABEL_DD1	ROW_DD1	ROW_LETTE...	SERIAL_DD1	WELL_ID_DD1
47094	ESP0009125	11	131	AlphaScreen x...	6	F	4	F11
45583	ESP0009125	12	132	AlphaScreen x...	6	F	4	F12
49982	ESP0009125	13	133	AlphaScreen x...	6	F	4	F13
42435	ESP0009125	14	134	AlphaScreen x...	6	F	4	F14
49909	ESP0009125	15	135	AlphaScreen x...	6	F	4	F15
51020	ESP0009125	16	136	AlphaScreen x...	6	F	4	F16
54883	ESP0009125	17	137	AlphaScreen x...	6	F	4	F17
47406	ESP0009125	18	138	AlphaScreen x...	6	F	4	F18
50959	ESP0009125	19	139	AlphaScreen x...	6	F	4	F19
47468	ESP0009125	20	140	AlphaScreen x...	6	F	4	F20
49681	ESP0009125	21	141	AlphaScreen x...	6	F	4	F21
49345	ESP0009125	22	142	AlphaScreen x...	6	F	4	F22
26828	ESP0009125	23	143	AlphaScreen x...	6	F	4	F23
654	ESP0009125	24	144	AlphaScreen x...	6	F	4	F24
49002	ESP0009125	1	145	AlphaScreen x...	7	G	4	G1
49944	ESP0009125	2	146	AlphaScreen x...	7	G	4	G2
56031	ESP0009125	3	147	AlphaScreen x...	7	G	4	G3
48900	ESP0009125	4	148	AlphaScreen x...	7	G	4	G4
54376	ESP0009125	5	149	AlphaScreen x...	7	G	4	G5
48531	ESP0009125	6	150	AlphaScreen x...	7	G	4	G6
53048	ESP0009125	7	151	AlphaScreen x...	7	G	4	G7
50303	ESP0009125	8	152	AlphaScreen x...	7	G	4	G8
48608	ESP0009125	9	153	AlphaScreen x...	7	G	4	G9
48233	ESP0009125	10	154	AlphaScreen x...	7	G	4	G10
49402	ESP0009125	11	155	AlphaScreen x...	7	G	4	G11
49495	ESP0009125	12	156	AlphaScreen x...	7	G	4	G12
53904	ESP0009125	13	157	AlphaScreen x...	7	G	4	G13
49702	ESP0009125	14	158	AlphaScreen x...	7	G	4	G14
47576	ESP0009125	15	159	AlphaScreen x...	7	G	4	G15
49534	ESP0009125	16	160	AlphaScreen x...	7	G	4	G16

## Common issues and troubleshooting on Information Designer

- Use right-mouse “Validate” on Information Elements. The most likely cause of the “Validation unsuccessful” Information Link message is that the Data Source is not accessible (wrong data source, wrong credentials, database down, ...)
- Invalid SQL: Test your SQL in the source database first to make sure it is valid (e.g. with database vendor tools like SQL+)
- Join Columns issue: Source columns used have been modified or dropped in the source database
- For more information about executed SQL queries performed when an Information Link is executed check the SQL Log file on the Spotfire server





**Questions? Thank you for your time!**

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