



MICROSTRATEGY



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About the Tutorial

MicroStrategy is a Business Intelligence software, which offers a wide range of data analytics capabilities. As a suite of applications, it offers Data Discovery, Advanced Analytics, Data Visualizations, Embedded BI, and Banded Reports and Statements. It can connect to data warehouses, relational systems, flat files, web services and a host of other types of sources to pull data for analysis.

Features such as highly formatted reports, ad hoc query, thresholds and alerts, and automated report distribution makes MicroStrategy an industry leader in BI software space. It is recognized as a visionary by Gartner Magic Quadrant.

Audience

This tutorial is designed for all those readers who want to create, read, write, and modify Business Intelligence Reports and dashboards using MicroStrategy Desktop. In addition, it will also be quite useful for those readers who look forward to become a Data Analyst or a Data Scientist.

Prerequisites

Before proceeding with this tutorial, you should have a basic understanding of Computer Programming terminologies and Data analysis. You should also have some knowledge on various types of graphs and charts. Familiarity with SQL will help in fast learning.

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MicroStrategy Basics

1. MicroStrategy – Overview

As a Business Intelligence tool with wide range of capabilities, MicroStrategy has powerful features that helps to find answers and insights in business data analysis. Following are some of the important features.

Data Discovery

This feature enables MicroStrategy to connect to any data source and blend the data from various sources. It can connect to relational sources, flat files, big data sources, social media platforms, and cloud systems to name a few.

Data Wrangling

This feature helps in data transformation and modification with an extensive set of built-in data wrangling and parsing capabilities. Business users benefit from automatic recommendations while data scientists can leverage the full breadth of wrangling capabilities. There are history scripts that remember data transformations and can be reapplied to any analysis.

Data Mining and Predictive Analysis

MicroStrategy has a wide range of native analytical capabilities, with the option to easily incorporate third-party data mining and modeling tools. The Data Mining Services can be used by business users, report designers and analysts to view and build predictive reports and distribute these reports to users on any device.

Library of Analytics Functions

It has an extensive library of over 300 OLAP, mathematical, financial, and data mining functions, which can be used to better understand the relationships between data, create business metrics and top-level KPIs, or build advanced statistical analyses.

Extensible Visualization Library

It has out-of-the-box grids, graphs, and in-built data visualizations tools. It also allows addition of hundreds of open-source visualizations available from D3 or other providers with built-in tools that help with the integration process. It also has a visualization builder and SK to code a new visualization from scratch.

Real-time Dashboards

You can build dashboards that can source live data to provide real-time monitoring of the most current information. With scheduled updates that have controllable intervals, users can be guaranteed of the latest data.

Embedded BI

MicroStrategy comes with several out-of-the-box development-ready portlets that require no additional coding. These portlets allow organizations to seamlessly embed MicroStrategy functionality with IBM WebSphere, Oracle WebLogic, Microsoft SharePoint, and SAP NetWeaver, among others. A portal integration kit includes sample code and documentation for integrating MicroStrategy Web with other enterprise portals.

Mobile Platform

The existing visualizations, reports, and dashboards are instantly available in mobile platforms, once they are created.

2. MicroStrategy – Environment Setup

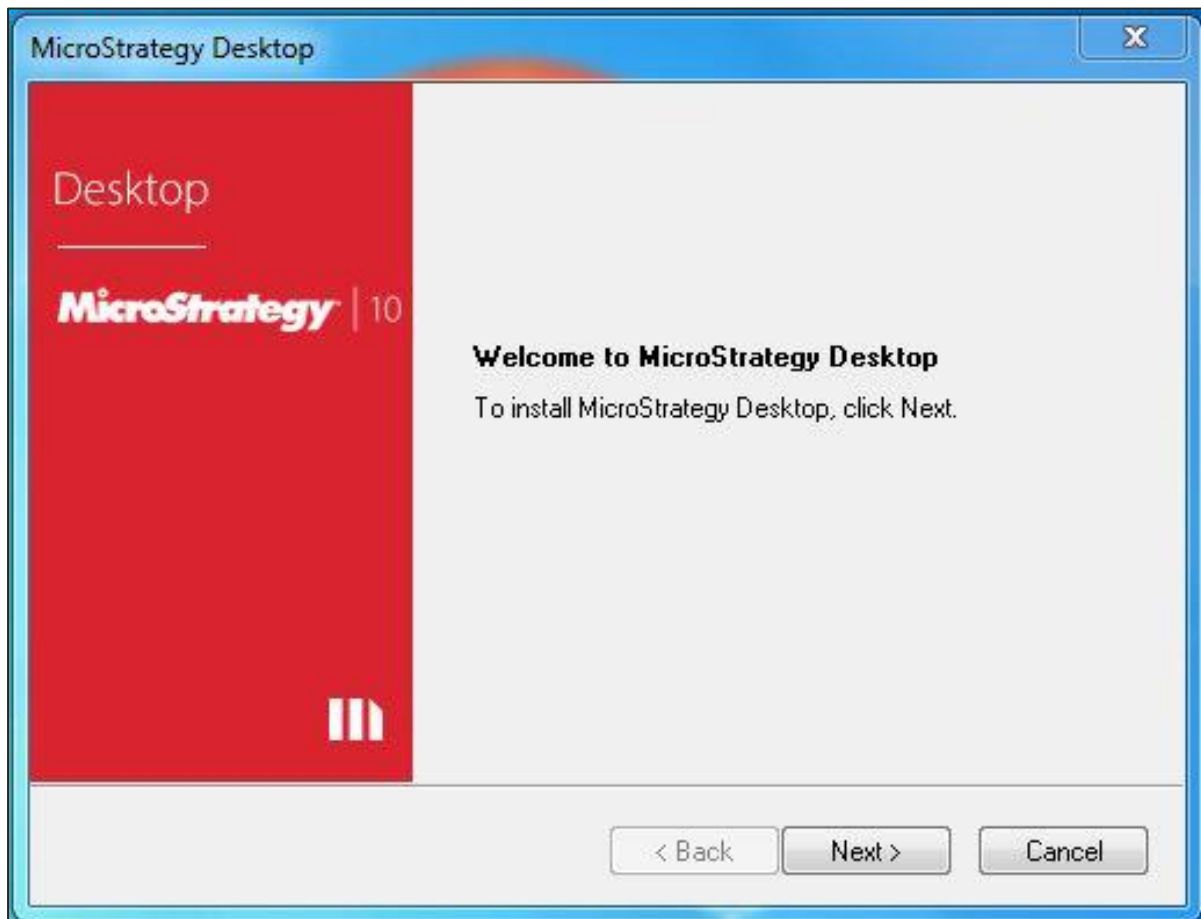
Download MicroStrategy Desktop

The Free Personal Edition of MicroStrategy Desktop can be downloaded from the [Microstrategy Desktop](#). To download, you need to register with your details.

After downloading, the installation is a very straightforward process in which you need to accept the license agreement and provide the target folder for storing the desktop version. Desktop version is available for both Windows and Mac OS. In this tutorial, we will consider only the Windows version. The following screenshots describe the setup steps.

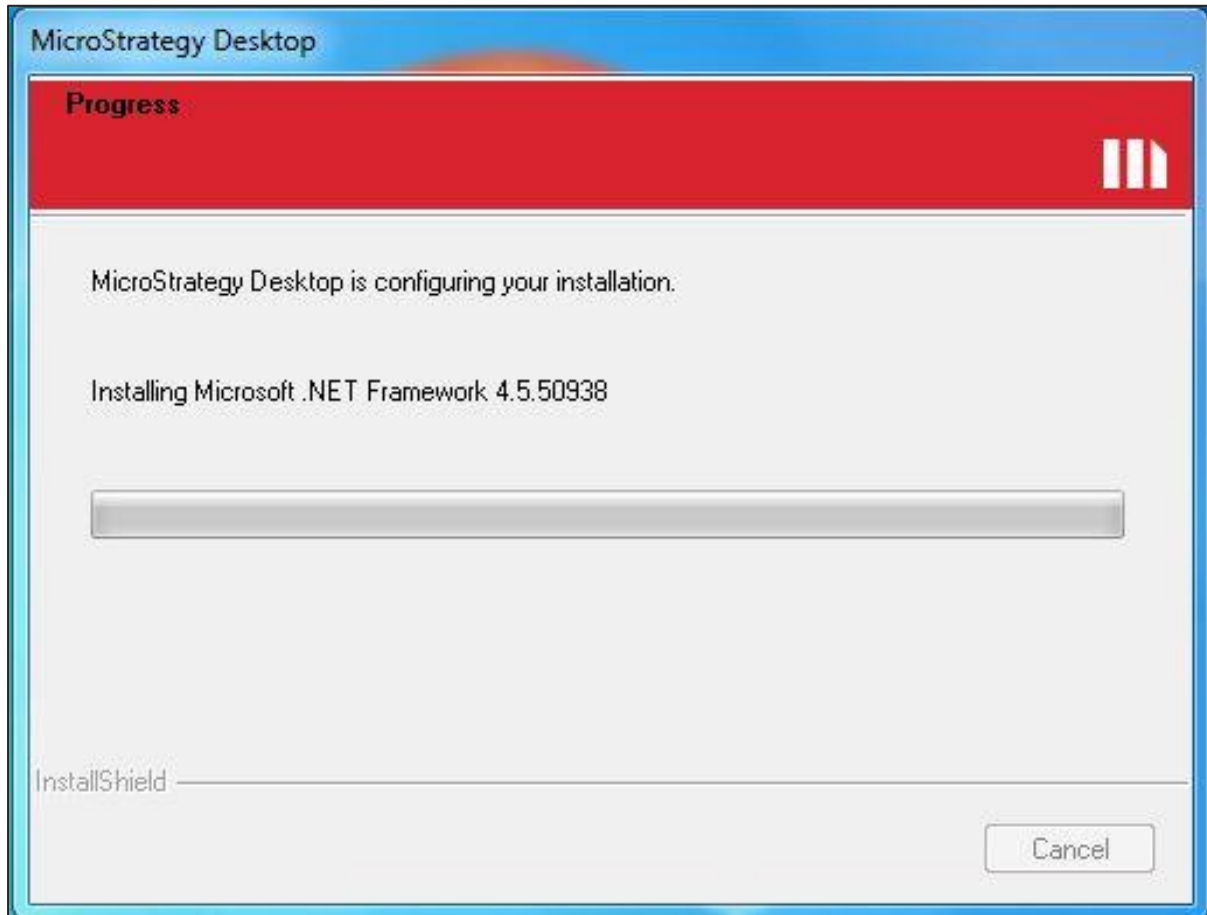
Start the Installation Wizard

Double-click the MicroStrategy Desktop-64bit.exe and it will present a screen to allow the installation program to run. Click Next.



Required Components

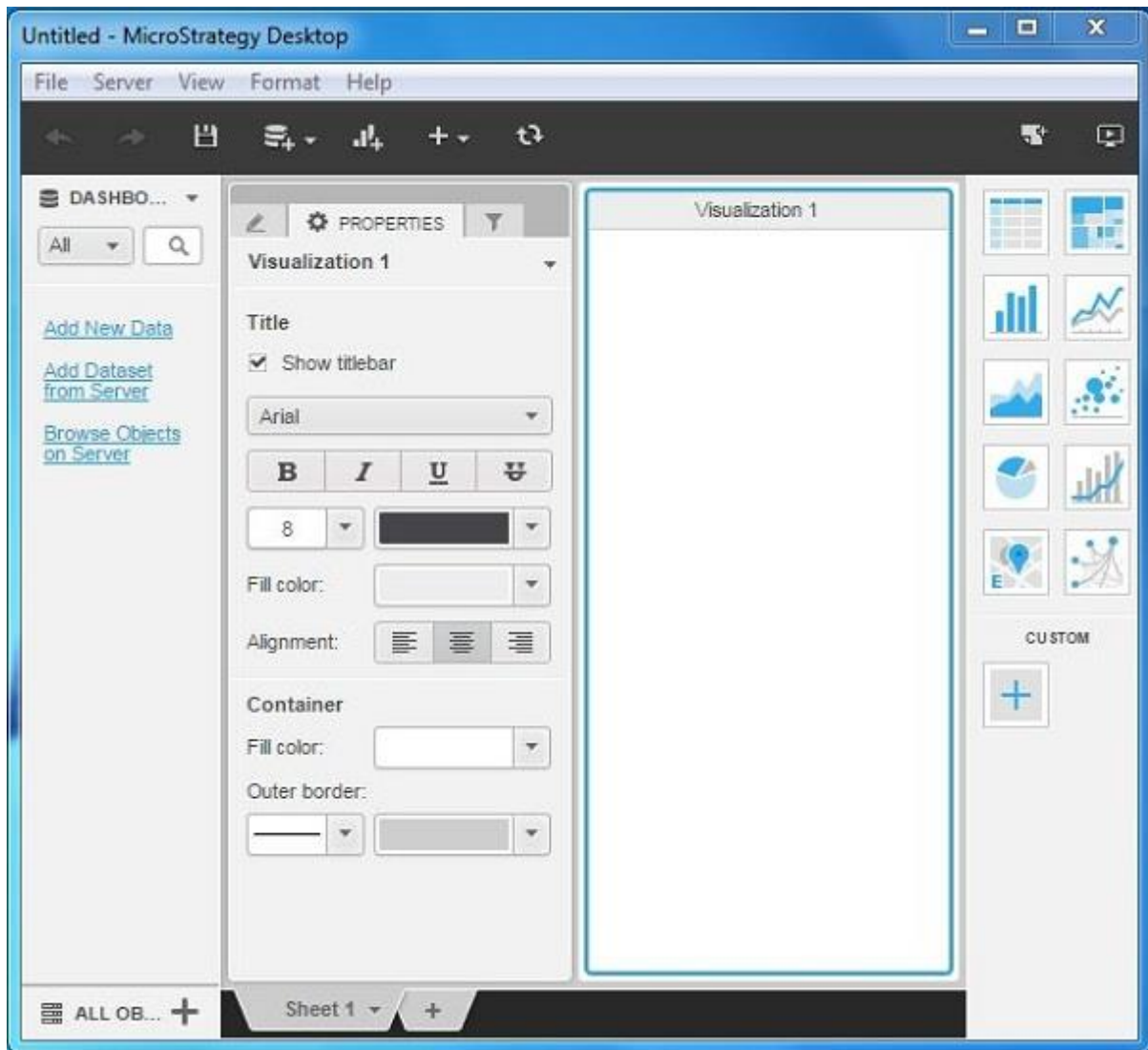
Depending on the Windows environment, you may need additional Windows platform software for MicroStrategy to run. .Net Framework is a common requirement. The installation process takes care of it on its own.



On successful completion of the above steps, MicroStrategy Desktop is available on your system.

Verify the Installation

To verify that MicroStrategy Desktop has been successfully installed, open the start menu in Windows and click the icon for MicroStrategy. The following window opens confirming the installation of MicroStrategy Desktop.

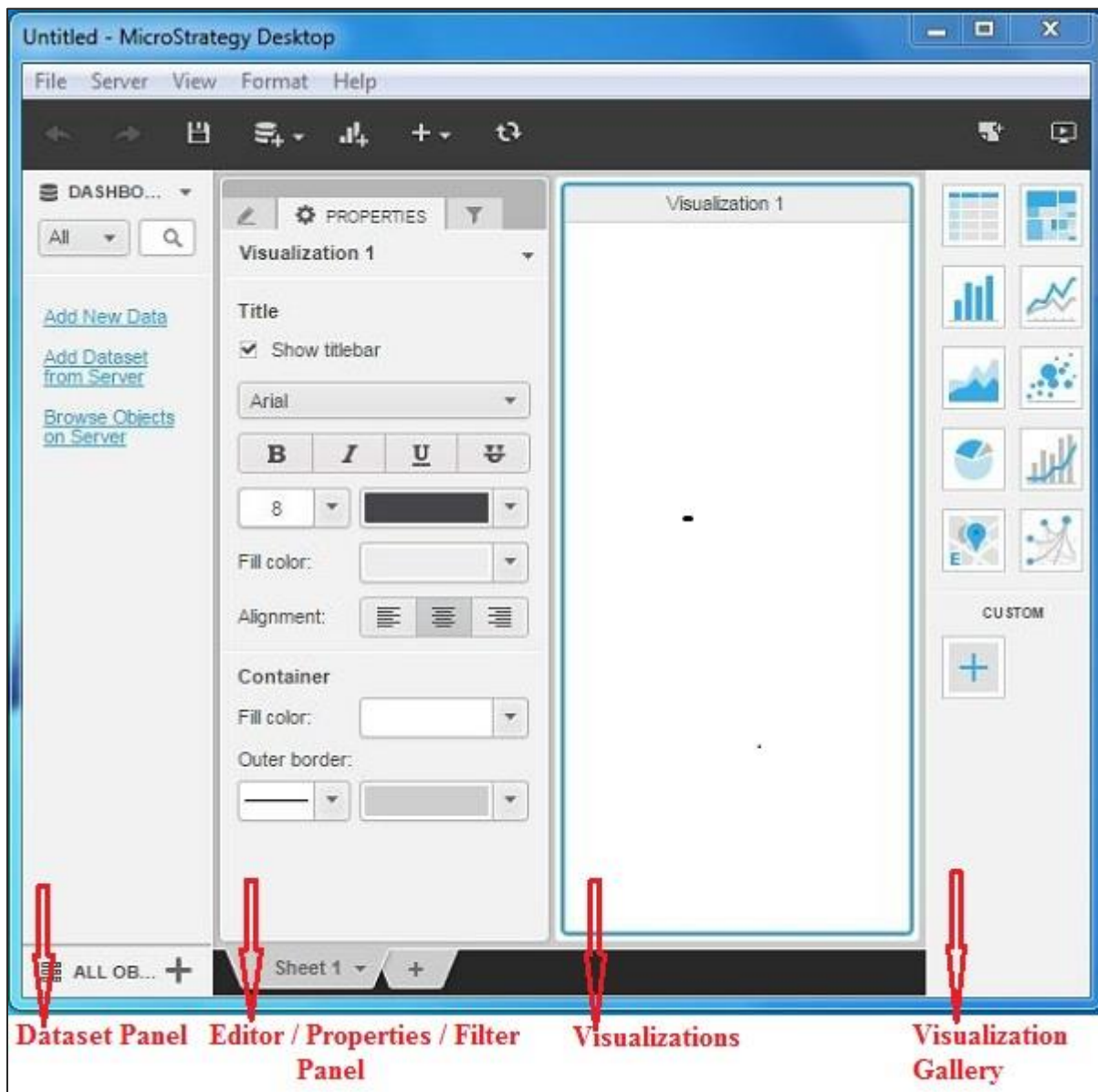


3. MicroStrategy – Desktop

The MicroStrategy Desktop environment is very intuitive. It has a simple menu to import data for analysis and export the result of analysis. The menu also provides features to connect to a server if required, view the data sets available, the visualization gallery, and data filtering options, etc.

Desktop Windows

Following screenshot shows the image of MicroStrategy desktop windows.



Following is a brief description of each of these windows.

- **Dataset Panel:** This is used to add the required data sets to be analyzed. The data sets can come from any of the compatible sources. This section also gives an option to connect to the data sets available in MicroStrategy server.
- **Editor Panel:** This is used to bring in the required rows and columns from the data set for analysis. Also the different matrices or mathematical expressions can be applied to the data analysis available here.
- **Properties Panel:** This panel is used to set the display formats of the data such as font size, color alignment. etc.
- **Filter Panel:** This panel is used to apply various filters on the data sets being analyzed.
- **Visualizations:** It is the panel which shows data analysis. You can drag the data objects to this panel and apply a method of visualization to see the results.
- **Visualization Gallery:** This panel displays the inbuilt-visualizations available, which can be applied directly on the data set. The various visualizations available are – Heat maps, bar charts, bubble charts, network diagrams, etc. It also allows to create custom visualizations.

4. MicroStrategy – Architecture

MicroStrategy has a metadata-driven architecture. The metadata is a central repository, which stores all the objects used by it. Also the metadata can be used by any of the MicroStrategy products, which has ensured uniformity in the values of the objects. The objects stored in the metadata are reusable.

Object Layers

The following diagram represents the different layer of objects created and stored in MicroStrategy metadata.

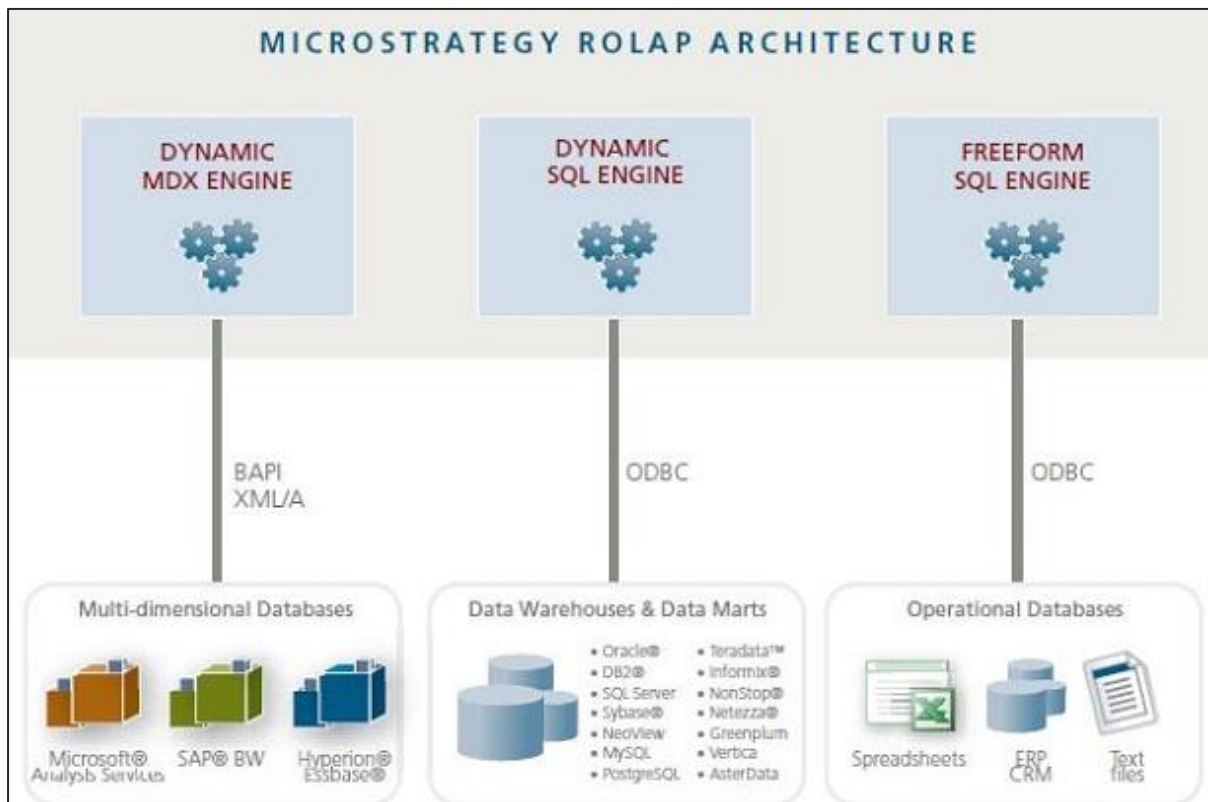


- **Administration Objects:** This Objects layer establishes the security, user grouping, and performance parameters that govern the MicroStrategy applications.
- **Report Objects:** This objects layer assembles the building blocks from the Schema and Analysis Object Layers to provide insightful textual and visual analysis.
- **Analysis Objects:** This objects layer provides the building blocks for sophisticated analysis. The analysis objects are built on the objects developed in the schema layer.
- **Schema Objects:** This objects layer provides a logical abstraction of the database schema that is tailored for the business model.

ROLAP Architecture

MicroStrategy can access data from data warehouses, cube databases, flat files, operational databases such as ERPs, CRMS, Web applications, etc. For this, it uses a relational OLAP architecture.

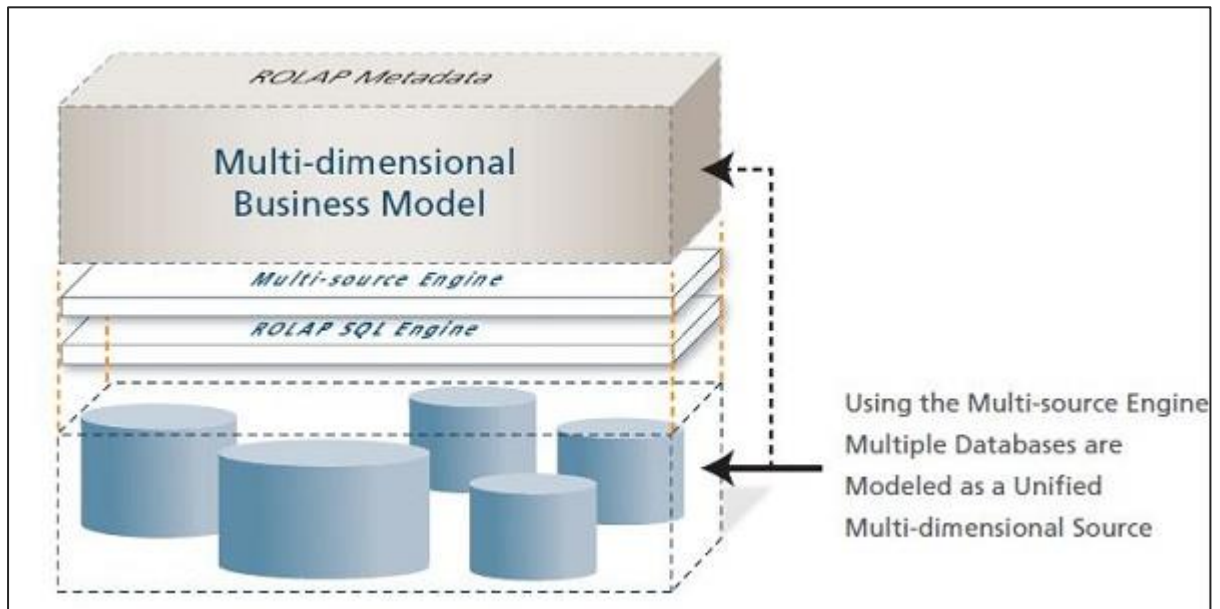
The following diagram shows an overall architecture of MicroStrategy platform describing how it accesses data from various sources using the metadata objects.



- **Dynamic MDX Engine:** It generates optimized Multidimensional Expressions (MDX) for interactively accessing cube databases from SAP, Microsoft Analysis Services, Hyperion Essbase, etc.
- **Dynamic SQL Engine:** It generates optimized SQL for interactively accessing data warehouses.
- **Freeform SQL Engine:** It provides direct access to operational databases, text files, and spreadsheets via a graphical Query Builder or through freehand SQL.

Unified Metadata

Finally, MicroStrategy Architect can model multiple sources as if they were a single data source, storing all this information in MicroStrategy's unified metadata.

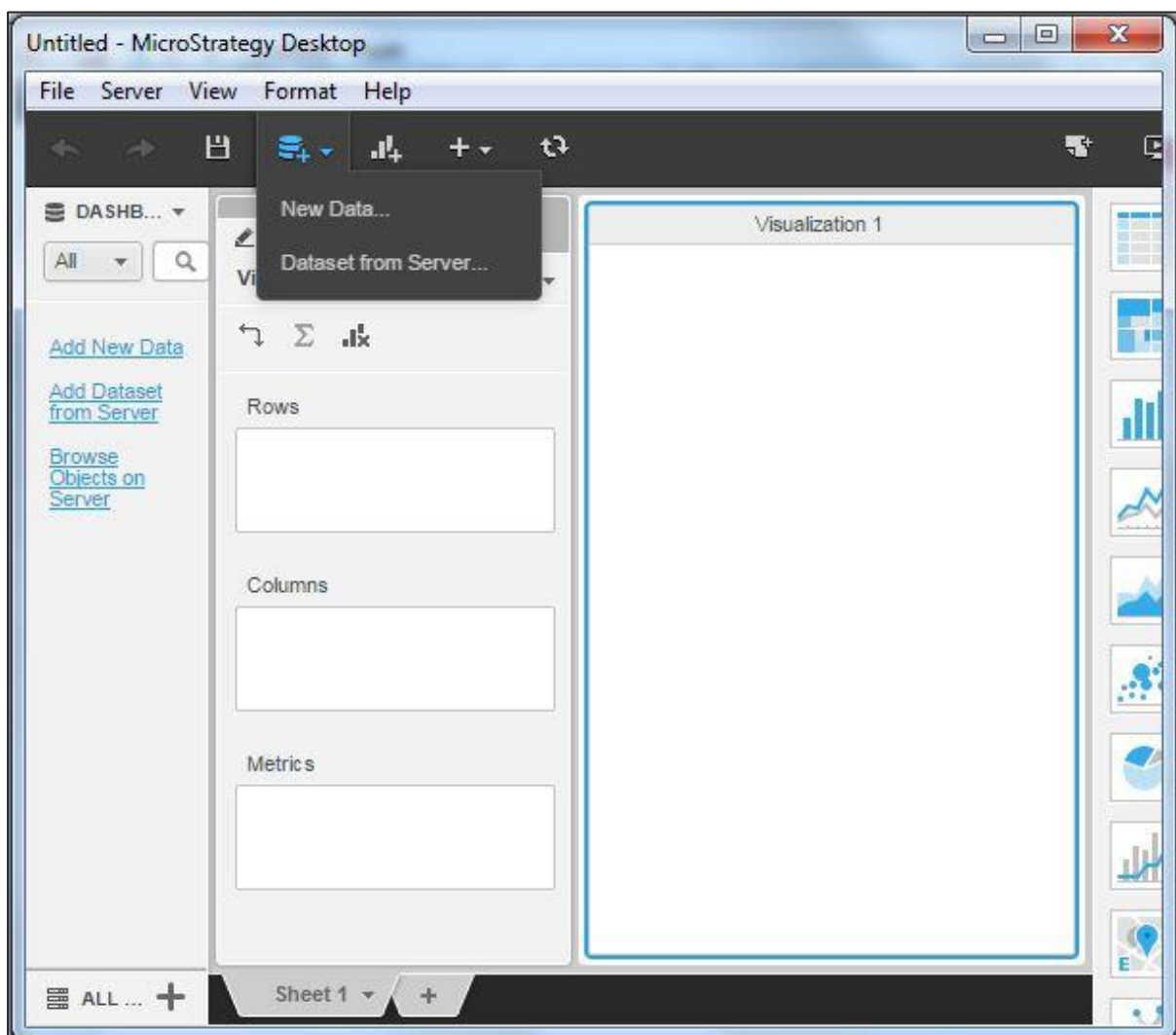


5. MicroStrategy – Importing Data

MicroStrategy connects to nearly every kind of data source available. It has native connectors, which establish connection with these data sources and also has a connect live feature, which fetches data as and when required. Interestingly, it also shows the icons of data sources for quicker identification of data source you are looking for.

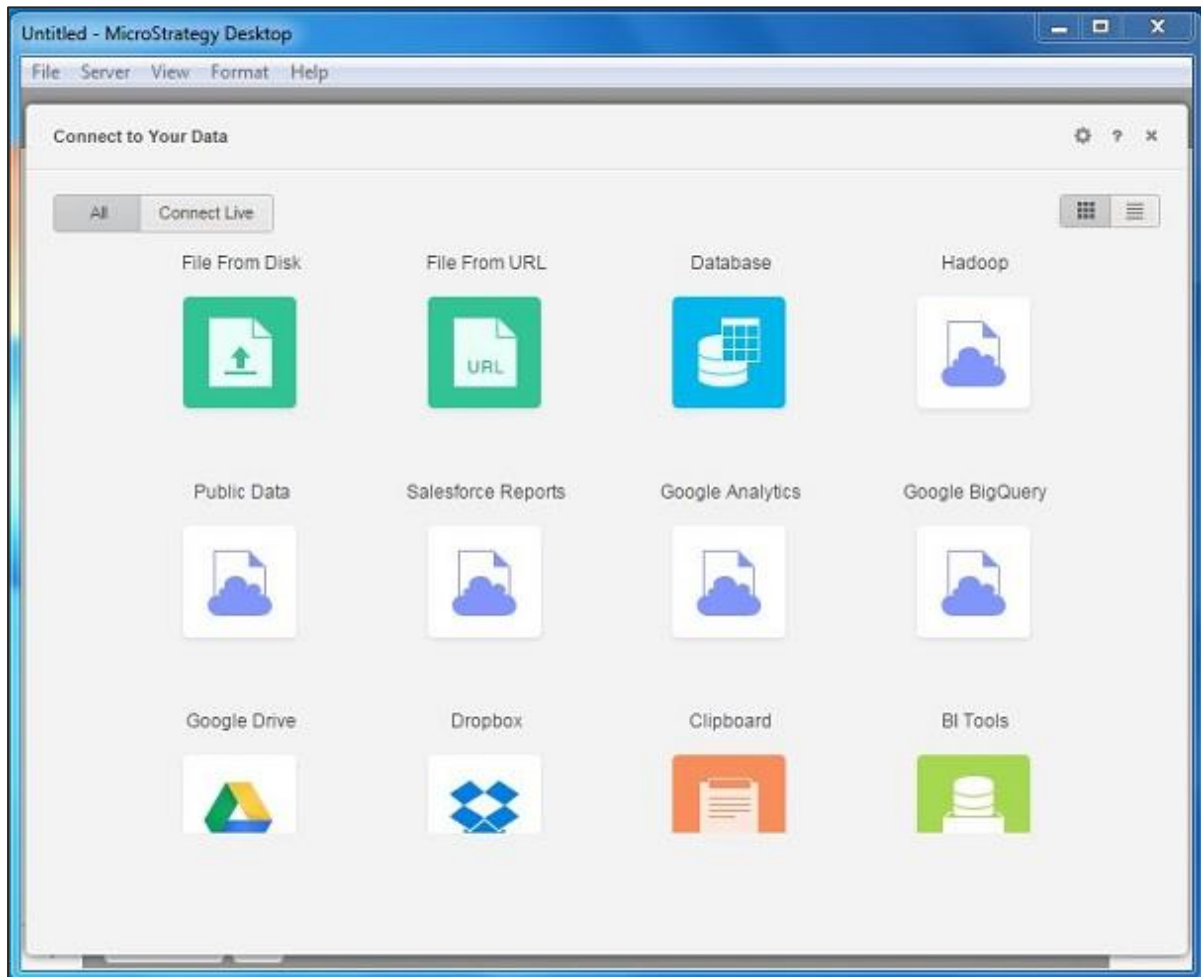
Add Data

The simplest way to search and select the required data set is by using the Add Data option available with a + icon under the main menu. The following diagram shows the steps to add data.



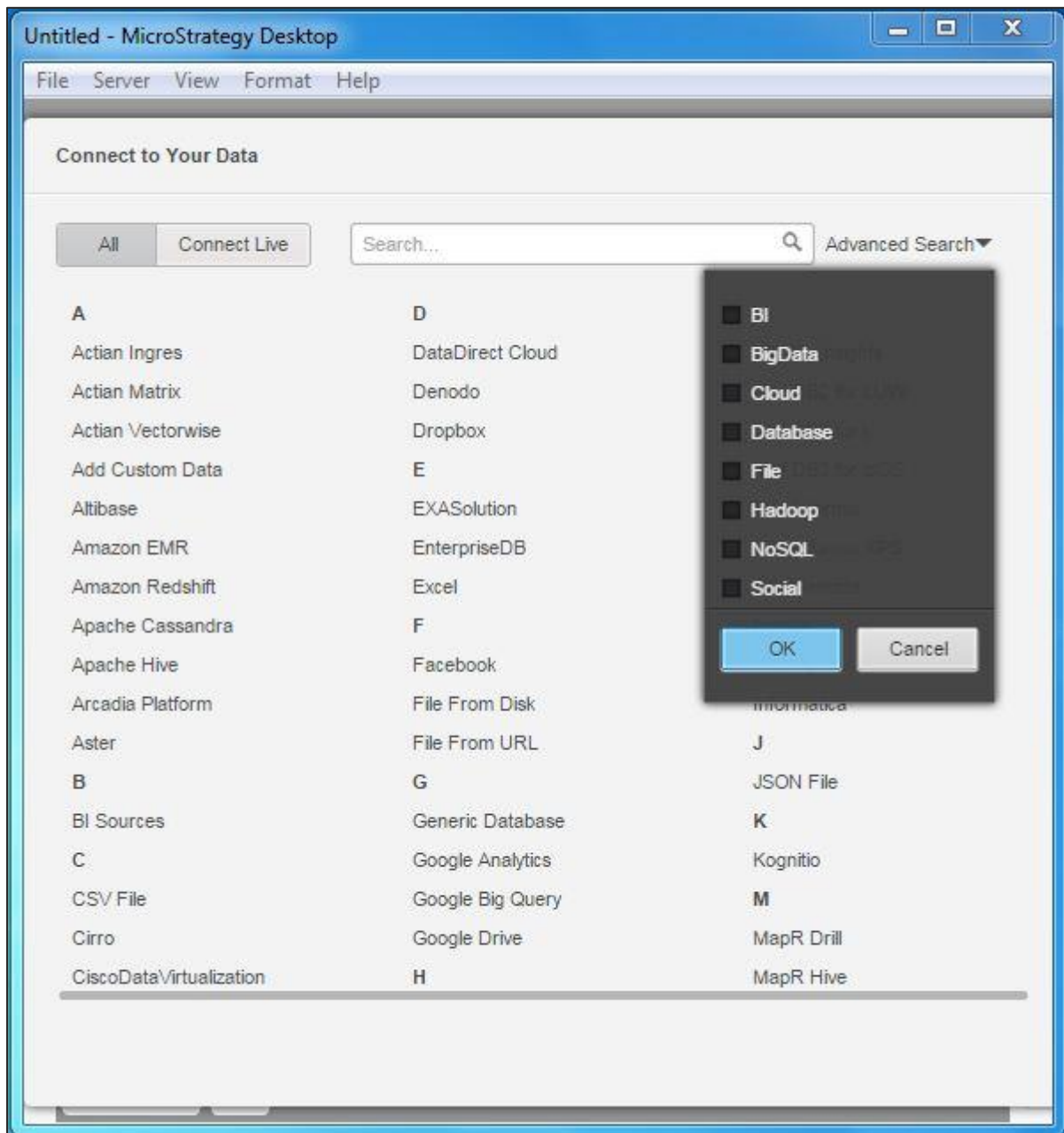
Data Sources

On clicking the Add Data option, we see the icons of various data sources. These help in quickly identifying the data source.



Search Data Source

With this vast number of connection types available, sometimes we need to type in the data source name or filter it from a small group of data set names. MicroStrategy has the feature of advanced search, which makes it possible.

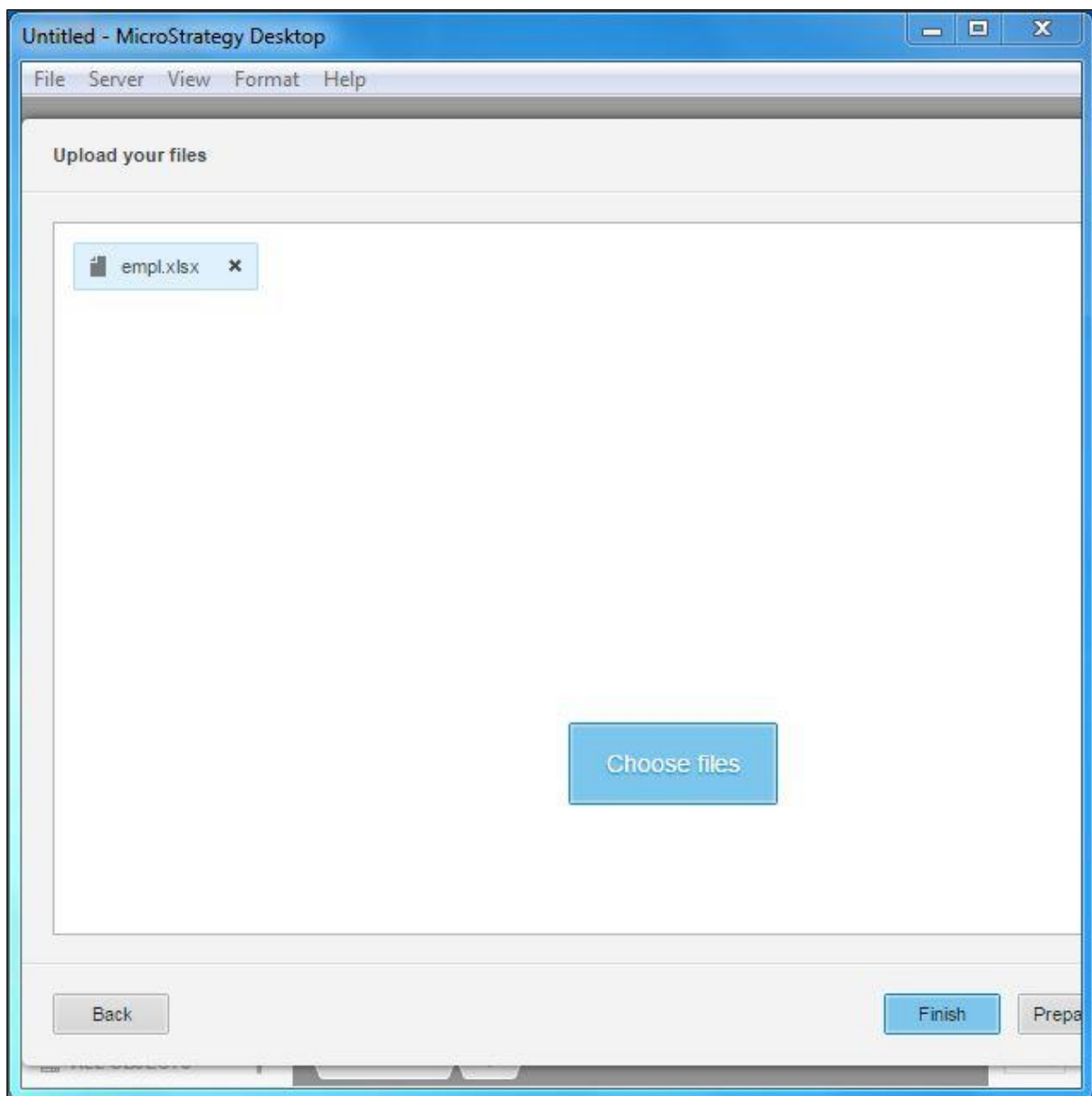


Adding Data from Files

In this section, we will see how to add an excel file as a data source and create a simple visualization.

Select the Excel File

Click the option Add Data and choose Excel available under the alphabetically arranged headers showing **E**. The window shows a Choose File option and clicking it we can browse the local system to select the required excel file. In the following example, we have a sample file containing the employee data of an organization.



Prepare the Excel File

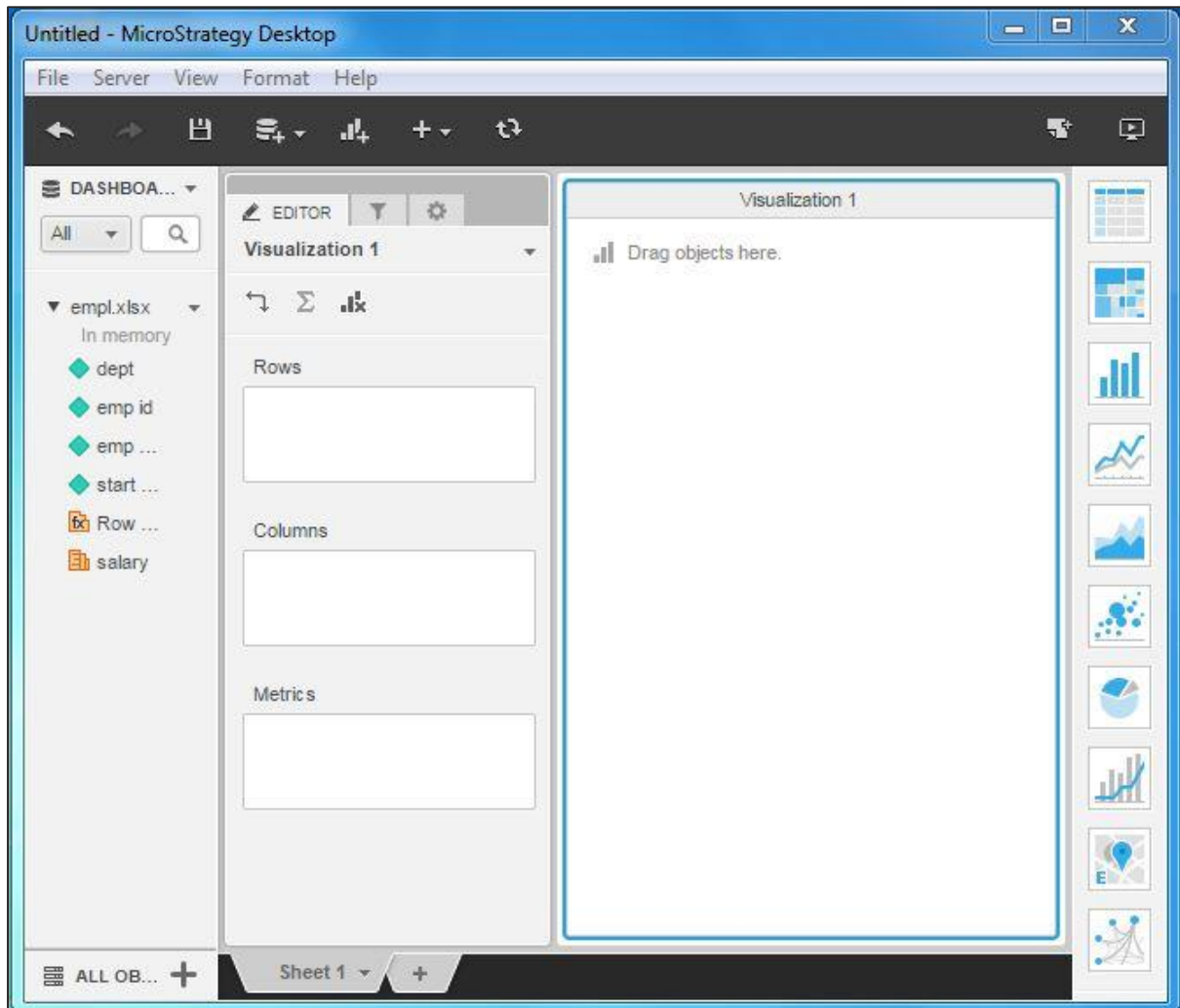
Before accepting the content of the Excel file, we can preview and also edit the data present in it. Once the file is selected, we can see the button Prepare Data next to the Finish button. Clicking it produces a preview of the data present in the file.

The screenshot shows the 'Preview' window in MicroStrategy Desktop. The window title is 'Untitled - MicroStrategy Desktop'. The menu bar includes 'File', 'Server', 'View', 'Format', and 'Help'. The main area is divided into two sections: a large dashed box on the left with a plus sign and the text 'Add a new table', and a list of attributes and metrics on the right. The attributes listed are 'emp id', 'emp name', 'start date', and 'dept'. The metrics listed are 'salary'. Below this, a table preview shows 12 rows of data (3 visible). The table has columns for 'emp id', 'emp name', 'salary', 'start date', and 'dept'. The data rows are: (1, Rick, 623.3, 1/1/2012, IT), (2, Dan, 515.2, 9/23/2013, Operations), and (3, Michelle, 611, 11/15/2014, IT). At the bottom right, there are 'Finish' and 'Cancel' buttons. A 'Wrangle...' button is also visible above the table.

emp id	emp name	salary	start date	dept
1	Rick	623.3	1/1/2012	IT
2	Dan	515.2	9/23/2013	Operations
3	Michelle	611	11/15/2014	IT

Prepare Visualization

On clicking Finish, after the data is previewed, we are presented with the MicroStrategy window showing the data objects chosen.



Next, we can create a simple visualization from this data source by dragging the columns in the data source into rows and columns boxes. A metric can also be added. The following diagram shows the final visualization.

The screenshot displays the MicroStrategy Desktop interface. On the left, a dashboard pane shows a data source named 'empl...' with fields 'dept', 'emp id', 'emp ...', 'start ...', 'Row ...', and 'salary'. The 'salary' field is selected. The central editor pane shows 'Visualization 1' with 'emp id' in the Rows box, 'dept' in the Columns box, and 'salary' in the Metrics box. The main visualization area shows a pivot table with the following data:

dept	Finance	HR	IT	Operations
emp id	salary	salary	salary	salary
1			623.3	
2				515.2
3			611	
4		729		
5	843.25			
6			578	
7				722.5
8	632.8			
9			583.4	
10			611.5	
11				486.2
Total	1476.05	729	3007.2	1723.9

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