The Tableau Environment at Princeton

How Does Tableau Fit with Cognos?

It's important to know that Tableau is not meant to be a replacement for Cognos. Here are some quick reference points about the two tools.

Cognos will remain the primary reporting tool for the University.

- Represents the primary "front door" to the Information Warehouse
- Continued focus on operational reporting
- Capable of supporting analytics
- Scaled to support the entire University
- Provides a supportable platform for scheduled and ad hoc report distribution
- Totally browser-based with unlimited client usage
- Centrally managed, highly structured

Tableau is an additional tool that will serve as an option for analytics and data visualization.

- Primary source of data will be the Information Warehouse
- Will not replace Cognos as the enterprise reporting tool
- Lacks some of the enterprise-wide reporting capabilities, such as report distribution and "bursting"
- Has the capability to integrate local sources of data (spreadsheets, surveys, etc.)
    - Includes both a desktop version (limited number of licenses) and a web version for Interactors and Viewers

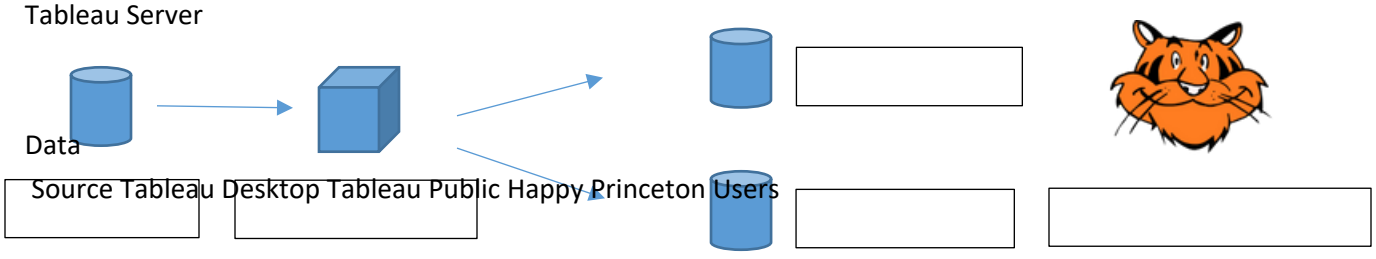
What you need to know about Tableau and how we use it at Princeton

As an introduction, let's take a step back and give the 100,000 foot view of Tableau. It's important to understand how or why you might be working with your data and to assess what your level of usage might be. Below are some important questions to consider:

- Will I be creating my own reports or will I only access reports others have created?
- Will others need to access the reports I create?
- Will reports I create need to be available to the general public?
- Do I need a license?

The answer to each of these questions will determine the type of access you'll need and how you'll need to handle the distribution or publication of your material.

Here at Princeton, we use Tableau in a manner similar to the way in which we use the data warehouse. Differences arise from the structure of the tool itself.



You may choose from a variety of data sources. We'll go into further detail about these in a little while.

Tableau Desktop is central to the creation of all Tableau visualization and data sources. In fact, if you only want to create reports but do not have a need for circulation or wider consumption, the desktop version would be all you need.

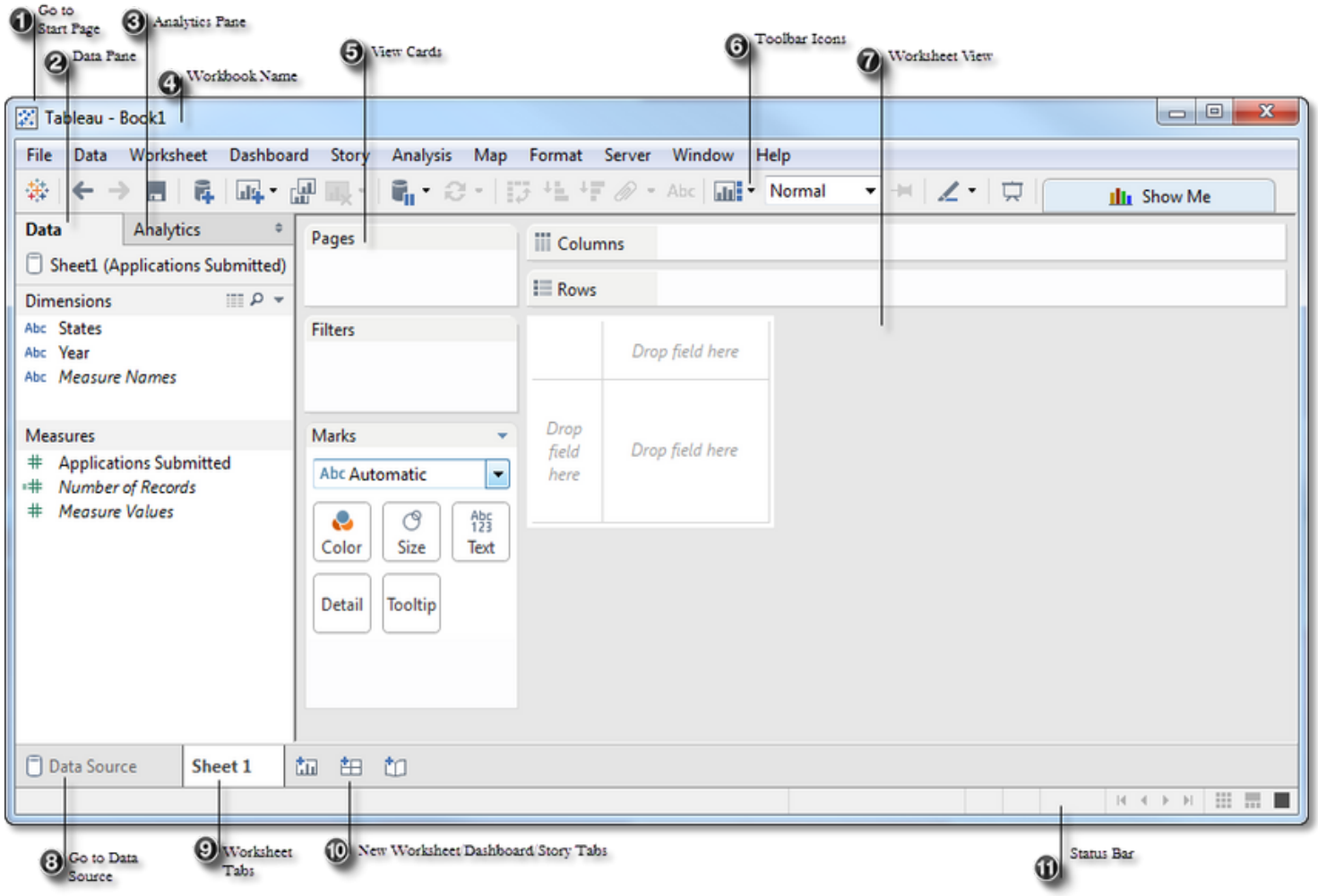
Tableau Server is used when you have a visualization that has been designed to be consumed by others. If you have a specific, restricted audience and would like to control the manner in which they interact with your work, they should be defined on the server and you would publish your work to be accessed.

Tableau Public is a version of server but security has been setup such that the visualizations published here may be accessed without authentication. This is where you would publish work that you want anyone at all to view and consume. An example of this would be a graph demonstrating historical applications to the university. This might be included on the Princeton public website.

CeDAR takes a role in the Princeton Tableau world by centrally managing the Tableau Desktop licenses and providing training. We also maintain the Tableau Servers (Development, Production, and Public). Finally we coordinate the Princeton Tableau User Group where we can all share experiences and ask questions of one another.

The Tableau Reporting Tool

Application Terminology

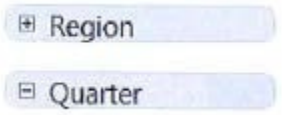


1. **Go to Start Page**: Toggle between the active sheet and the Desktop Start Page.
2. **Data Pane**: Includes dimensions and measures, populated from your selected data source. May also include calculated fields, parameters, or sets.
3. **Analytics Pane**: Includes options you can use to apply reference lines, forecasts, trend lines, to add totals to crosstabs, and to build boxplots.
4. **Workbook Name**: The file name of our workbook.
5. **View Cards**: Used for modifying the worksheet.
6. **Toolbar Icons**: Icons are available for quick access to popular features.
7. **Worksheet/View**: Workspace for building your visualizations.
8. **Go to Data Source**: Returns you to the data source specification page.
9. **Worksheet Tabs**: Click to view a specific worksheet, dashboard, or story
10. **New Worksheet, Dashboard, and Story Tabs**: Click to create a new Worksheet, Dashboard, or Story.
11. **Status Bar**: Displays data about the fields and marks included in the view.

Icons and Visual Cues for Fields

In the Data Pane and the Worksheet/View, Tableau displays visual cues. Each of the field icons can be modifie
in the Data Pane by one of four indicators:

Icon/Cues	Description
Abc	Blue icons indicate that the field is discrete.
=Abc	Green icons indicate that the field is continuous.
=!	Icons preceded by the equal sign (=) indicate that the field is a user-defined calculation or a copy of another field.
	Icons with an exclamation mark next to them indicate that the field is invalid.
	Move between the active data source or sheet and the Start Page. When on the Start Page, the icon is black. When on an active data source or sheet, the icon is in color.
	Undo Button: The left-facing arrow is will undo your last action.
	Redo Button: The right-facing arrow will redo your last action.
	Show/Hide Cards: Use this to edit the cards displayed.
	Swap: Use this icon to swap, quickly, axes of a visualization.
Abc	Text Values
#	Numeric Values
	Date Only Values
	Date & Time Values
	Geographical Data
	User-Defined Set
T|F	Boolean (True/False) Values
	Group
State	A blue field on a shelf indicates a **discrete** field.
Sales	A green field on a shelf indicates a **continuous** field.
Product	A (SORT) icon indicates a sorted field.

	The delta icon indicates that the field has a table calculation applied to it.
	The plus and minus controls appear when the field is part of the hierarchy in which you can drill up or down.

Getting Started in Tableau Desktop

The Tableau Workspace is made up of menus, a toolbar, the Data and Analytics panes, cards and shelves, and one or more sheets (worksheets, dashboards, and/or stories).

Data Pane

Component	Description
Dimensions	Fields that contain category data such as text and dates. Dimensions create the axis headers in a view.
Measures	Fields that contain numbers that can be aggregated. Measures create the axes in a view.
Parameters	Author-defined variables that can replace constant values in calculated fields and filters.
Sets	Subsets of data that are defined by you.

Analytics Pane

Component	Description
Summarize	Includes options to add pre-defined components such as constant and average lines, medians with quartiles, box plots, and totals.
Model	Adds modeling information to your view, such as trend lines, forecasting, and average distribution band.
Custom	Add custom lines, bands, and box plots.

View Components

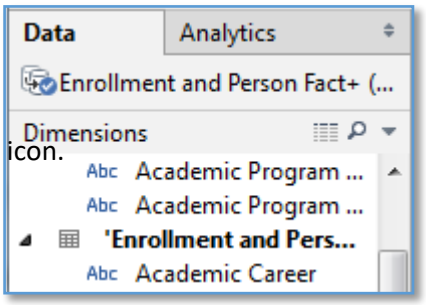
The View area is where you create your visualization. It is located to the right of the Side Bar. Drag items from the Side Bar to the View to being creating your visualization.

Component	Description
Columns and Rows	Drag dimension and measure fields to these shelves to define how you want the data shown in the view.
Pages	Show data changes over time or across discrete dimensions.
Filter	Drag fields to the Filters shelf to limit the number of members shown. Exposed filters in a dashboard allow others to control how they view the visualization.
Marks	Data as shown in the visualization. Bars, circles, pies, text, and lines are examples of Marks.

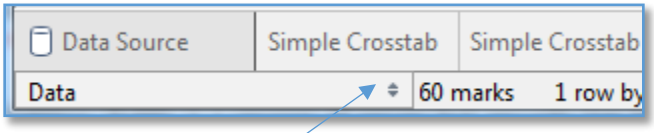
	Marks Card Tools used to change the appearance of “mark” types.
	The tabs across the bottom of the view correspond to the worksheets contained **Worksheets** within the entire workbook. To add a new worksheet, click the New Worksheet tab and a new worksheet displays.
	When you connect to data, Tableau categorizes your data fields as Dimensions (discrete categories of data) and Measures (numeric data values). When you drag a dimension or measure into a view, the Tableau visualization process transforms your data into Marks, which are the visual form your data takes. Marks can be bars, lines, dots, shapes, numbers, or text.
	You would use the Marks card to change the attributes of the marks in your view. You can change the color, size, or mark type.
	Editing Attributes **To … Do This …** **Change the mark type** On the Marks card, select the drop-down menu and choose the mark type.
	Change colors Choose Color to access the color menu options.
	Adjust mark size Choose Size, and use the slider to adjust the size.
	Change label Choose Label to access the label menu options. Options available are dependent on selections you make. NOTE when TEXT is selected from the Marks dropdown, Label appears as Text.
Edit Tooltip	**Add Details** From the Data window, drag a dimension field to Detail to separate the marks in the view according to members of a dimension. Using details brings more data into a view without changing the table structure.
Assign values to Pie chart	Choose Tooltip, and in the Edit Tooltip dialog box, edit the details of the tooltip.
Control the path of a line	On the Marks card, choose Pie from the drop-down menu, and drag a measure to Angle. Note: Angle only displays when Pie is selected. On the Marks card, choose either Line or Polygon from the dropdown menu, and drag a dimension to Path. Note: Path only displays when Line or Polygon is selected.

Helpful Hints

You can minimize your Data window by clicking the double arrow at the upper right corner of the window.



If you've minimized the Data window, it will collapse to the bottom status bar. You can restore the window again by clicking the same double arrow icon.



If you've accidentally hidden a card and want to show it again, there are two ways to do this.

1. Select the **Worksheet** menu and **Show Cards** option.
2. Click the **Show/Hide Cards** icon (shown to the right).

Data Sources

Tableau Desktop is a tool that allows you to connect to nearly any data source. These include Excel, Access, server sourced and cloud based data. You can also easily join multiple data sources for your visualizations. This can be useful when you need to include details from more than one source. For example, you may have performed a survey to find the effectiveness of a program. In order to determine whether the results varied by select demographic details, you might want to join the survey participant information with the personal details from a human resources database. By doing this, you could greatly enrich your reporting capabilities without overwhelming the survey takers with identifying information. This capability within Tableau allows you to move easily beyond previous reporting constraints.

However, with this ability comes a new responsibility. It's *extremely important* to understand fully the data on which you are reporting. Because you will be creating new joins and providing subsequent visualizations, it's important to know that the results are accurate. As you learn, validate your data by running queries from the warehouse or in other proven methods to ensure your counts are correct. Likewise, since you have the ability to create new data connections, it is your obligation to ensure you are not sharing any confidential material. This is discussed in depth in the following section.