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History

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Introduction to Data Visualization with Tableau Public

Overview

[Tableau Public](#) is a free visualization suite for creating interactive data visualizations online. The software provides detailed data overviews and enables toggling between different visualizations in a single click, making it easier to see which works better for the data and questions at hand.

While Tableau runs locally, it saves publicly. For data with privacy restrictions, you should use Tableau Desktop, which runs on and saves to your local machine. [Students](#) and [educators](#) can sign up for free yearly licenses to Tableau Desktop.

Example Project: Internet Users By Country Over Time

To practice working in Tableau Public, download this [dataset of internet users per 100 people](#) by going to the dataset, clicking "Raw," and then at the top of your browser, select "File" and "Save Page As..." Make sure that the file format saves as a comma separated value (CSV) file. This dataset was published by Tableau Public in 2018, but was originally published on [Knoema](#). The spreadsheet includes three variables or columns ("Country," "Internet users per 100 people," "Year") and 1,764 records or rows.

As a sample research scenario, let's imagine that someone just handed us this data. To get a better feel for its quality and what questions we might ask of it, we can create a few exploratory data visualizations in Tableau Public.

Set Up

1. [Download, install, and then open Tableau Public.](#)
2. Under "Connect," click on "Text file" and select the internet users CSV file. This will load a preview of your dataset.
3. Review Tableau's guesses as to what data types it's observing. The representations are as follows:

- Globe = geospatial data,
- Hashtag = numeric data,
- Abc = string (text) data,
- T|F = Boolean (true or false) data,
- Calendar = temporal data.

For our dataset, we need to change the "Year" column from a numeric value to a date. To do so, click on the hashtag symbol above "Year" and select "Date." You should notice that all of our years now also have a month and day attached to them; by default, Tableau treats dates as month-day-year.

4. To begin working with our data, click on the orange "Sheet 1" rectangle toward the bottom left-hand corner of the application. This will create our first Tableau sheet, a blank space for generating visualizations.

Interface Changes

Tableau version 2020.2 underwent major interface and functionality changes. You can read about all of the differences on [Tableau's website](#). Below, I will describe the most notable differences you'll see from the main interface.

Pre-2020.2 Tableau Versions

- On the left-hand column, there is the "Data" pane that sorts our data into "Dimensions" (categorical data) and "Measures" (numeric data). Under "Measures," you will see that Tableau has also automatically generated two additional measures: "Number of Records" (number of rows in the dataset) and "Measure Values" (sum of all values).

Tableau Version 2020.2

- On the left-hand column, Tableau now groups data as "Tables." While Tableau no longer explicitly calls out "Dimensions" and "Measures," there is a horizontal line that separates categorical and numeric data.

- Tableau still generates two fields: "Measure Values" (sum of all values) and the previously named "Number of Records," which now takes the name of your file.

Interface Interactions

Double-clicking or dragging any dimension or measure over to the "Columns" and "Rows" sections near the middle-top of the sheet will give you the opportunity to examine the data more closely. You can use the back arrow at the top left to undo actions.

- "Pages," "Filters," and "Marks" are where you will drag dimensions and measures in order to filter the data.
- The "Show Me" button on the top right can be clicked on and off. When clicked on, it shows you different visualizations you can toggle between, along with what kind of data you need in order to generate them. Toggle "Show Me" off for now, since it takes up screen real estate and will hide our filter settings (once we create a filter).

Bar Chart: Number of Internet Users

1. Drag "Country" to "Rows."
2. Drag "Internet users" to "Columns."
3. Sort data from most to least by clicking the icon with the three stacked rectangles and downward arrow (it's located in our toolbar at the top of the sheet).
4. Challenge: if our dataset is internet users per 100 people, then why does Iceland show 708.8 users? Answer: Tableau is summing all values that correspond with an "Iceland" row, regardless of whether they record is for a different date. To see internet users per 100 people, we need to add a year filter.
5. Create the year filter by dragging "Year" to the "Filters" card.
 - Select "Years" in the resulting pop-up box.
 - Click the "All" box.
 - Click "Ok." It will look like nothing happened.
 - To set the filter, click on the dropdown by "YEAR(Year)," and select "Show Filter." This will show the filter settings in the right-hand column (you may have to click off "Show Me" to see it).
 - In the right-hand column, click the dropdown by "YEAR(Year)," and select "Single Value (list)" to filter one year at a time.
6. We can now start asking questions of the data. For example, which 5 countries had the most internet users per 100 people in 1990? Which 5 countries had the most in 2015? What might account for the difference?
7. To focus in on those questions, let's add a country filter by dragging "Country" to the "Filters" card. This time, select the countries of interest. If we'd like to compare greatest

number of users in 1990 to 2015, we should select: the United States, Norway, Switzerland, Australia, Sweden, Iceland, Luxembourg, Andorra, and Liechtenstein.

8. To automate the temporal dimension, we can convert our time filter to a time slider by dragging "YEAR(Year)" from the "Filters" card to "Pages." In the right-hand column, you can click the right triangle button to activate the time slider and see how the number of users changes over time without any additional clicking on your (or your users') part.
9. Give a title to the chart by double clicking on the current "Sheet 1" title and inserting "Internet Users per 100 People by Country and Year." Leave "" there since it will automatically show what year we're viewing. Click "Apply" to see what the title will look like. Then click "Ok."
10. Change the "Sheet 1" name in the lower left-hand corner by double clicking on it and renaming it "bar chart."

Line Graph: Change over Time

1. Start a new sheet by clicking the icon next to our current sheet.
2. Double click on "Year" (this should add it to the "Columns" section)
3. Double click on "Internet users" (this should add it to the "Rows" section)
4. Drag "Country" to the "Color" mark - note the warning cautioning against the use of color for more than 20 records. To see what happens, click "Add all members." While the resulting line graph shows an overall increase in the number of users, it's difficult to track individual changes and differentiate colors. Click the back arrow in the top-left corner to undo.
5. Drag "Country" to the "Color" mark again, but this time, click "Filter and then add." Choose countries of interest (you might choose the same countries from the bar chart or new ones you want to highlight).
6. Change line colors by clicking on the dropdown next to "Country" in the right-hand column. Select a palette from the dropdown, or double click on the color next to an individual country's name to change it. When you have colors you like, click "Assign Palette" to see what they look like on the graph. Then click "Ok."
7. Give the graph the title: "Internet Users over Time by Country."
8. Rename the sheet to "line graph."

Map: Internet Users by Country

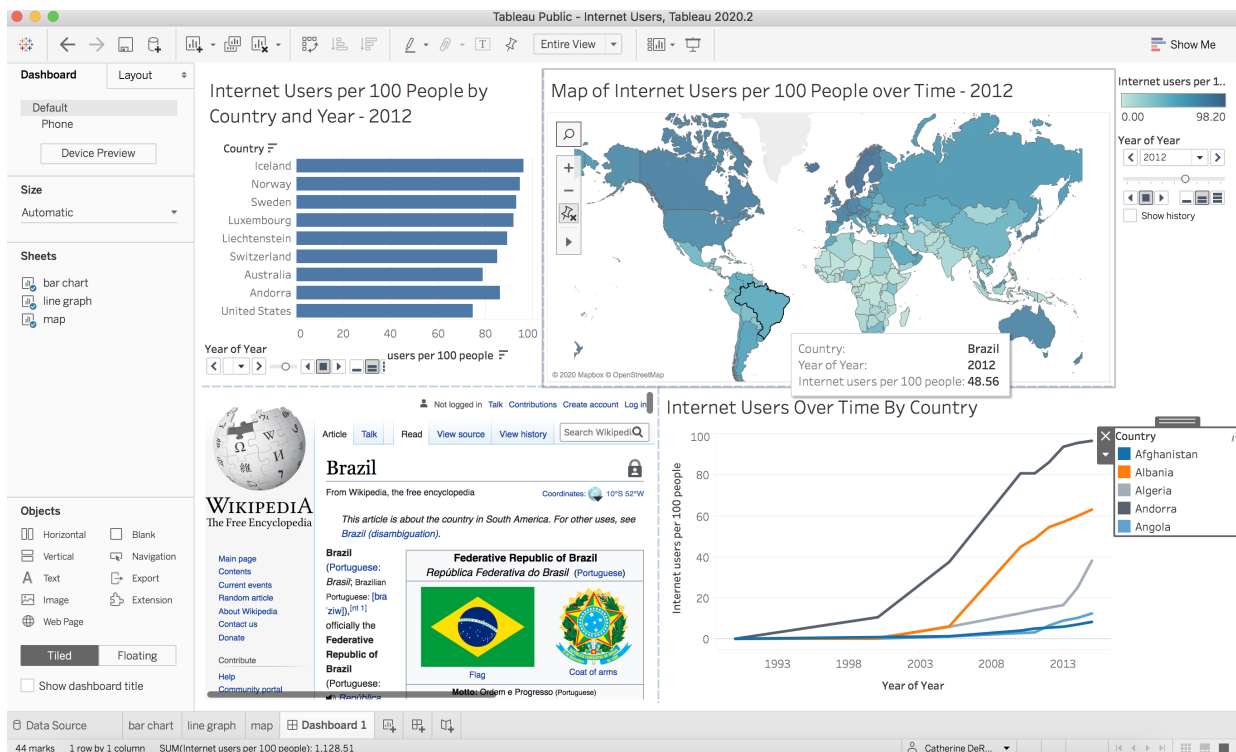
1. Start a new sheet.
2. Drag "Country" to "Columns."
3. Drag "Internet Users" to "Rows."
4. Click to turn on "Show Me" and select the second map, which will generate a choropleth map.
5. Notice that not all countries are filled in on the map. Click on "3 unknown" in the lower right-hand corner of the map to give Tableau a mapping between country names as they

appear in our dataset, and country names that Tableau knows.

- Dem. People's Rep. Korea to North Korea,
 - Dem. Rep. Congo to Democratic Republic of Congo,
 - Korea to South Korea.
6. Drag "Year" to "Pages" to see change over time.
 7. Give the map the title: "Map of Internet Users per 100 People over Time."
 8. Rename the sheet to "map."

Data Dashboard: Combine Visualizations Together

1. Start a data dashboard by clicking on the icon next to the sheet icon.
2. Adjust the size of the dashboard by clicking on the dropdown under "Size" in the left-hand column. This enables you to re-size for the device(s) your designing for. To have the dashboard take up the size of the screen you're using, click the size dropdown and then click the dropdown by "Range" and select "Automatic."
3. Double click on the sheet names in the left-hand column to add them to the dashboard. Practice re-arranging them on the dashboard.
4. To make the dashboard even more dynamic and informative, let's add a component that links out to the Wikipedia page for whichever country a user selects.
 - Drag a "Web Page" object onto the dashboard and click "Ok" without adding a URL.
 - On the dropdown box for the web page object, click "Add URL Action."
 - In the name field, type: "Go to Wikipedia page for" and then click the triangle button at the end of the line and select "Country."
 - For "Run action on," choose "Hover."
 - For URL, add: "<https://en.wikipedia.org/wiki/>" and then click on the triangle button and select "Country."
 - Click "Test Link" to see if it's working.
 - Click "Ok" and "Ok" again to add the action.
 - Hover on any data point in the dashboard, and the Wikipedia page should automatically update to reflect the country that's selected.



Save Your Work

To save your Tableau workbook, you have to create a free Tableau account. When you click save, you will be prompted to log in and save your workbook to Tableau's server, where it will be visible on Tableau Public. Users can interact with your workbook on Tableau Public, or they could download, add to, or otherwise edit it.

Next Steps, Cautions, & Additional Tips

- To learn about joining multiple datasets, creating data stories, running calculations, and managing a Tableau server, watch Tableau's free [online training videos](#).
- Word of caution: Tableau frequently has updates available, but they're not always backwards compatible. For that reason, you might not want to update to the newest version while you're in the middle of a project.
- For additional practice and open datasets, check out [#MakeoverMonday](#). Every week, Tableau shares a dataset and starter visualization, and challenges participants to remake it. You can find the results and share your own remakes on [Twitter](#). Better yet, if you see a makeover visualization you like, try downloading the workbook from Tableau Public to see how it was made!

[Give feedback](#)