

Building blocks of Power BI

12 minutes

Everything you do in Microsoft Power BI can be broken down into a few basic **building blocks**. After you understand these building blocks, you can expand on each of them and begin creating elaborate and complex reports. After all, even seemingly complex things are built from basic building blocks. For example, buildings are created with wood, steel, concrete and glass, and cars are made from metal, fabric, and rubber. Of course, buildings and cars can also be basic or elaborate, depending on how those basic building blocks are arranged.

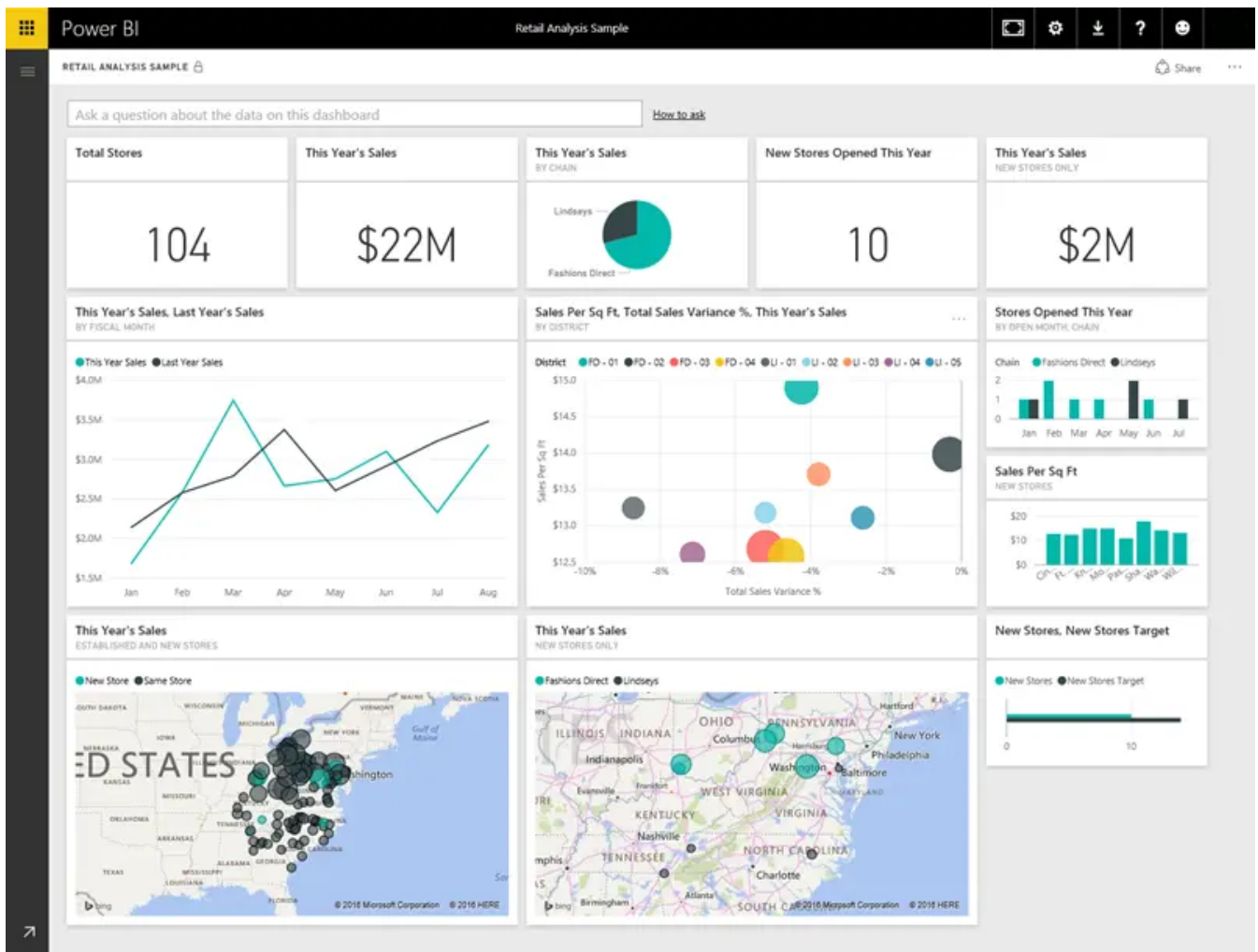
Let's take a look at these basic building blocks, discuss some simple things that can be built with them, and then get a glimpse into how complex things can also be created.

Here are the basic building blocks in Power BI:

- Visualizations
- Datasets
- Reports
- Dashboards
- Tiles

Visualizations

A **visualization** (sometimes also referred to as a **visual**) is a visual representation of data, like a chart, a color-coded map, or other interesting things you can create to represent your data visually. Power BI has all sorts of visualization types, and more are coming all the time. The following image shows a collection of different visualizations that were created in Power BI.



Visualizations can be simple, like a single number that represents something significant, or they can be visually complex, like a gradient-colored map that shows voter sentiment about a certain social issue or concern. The goal of a visual is to present data in a way that provides context and insights, both of which would probably be difficult to discern from a raw table of numbers or text.

Datasets

A **dataset** is a collection of data that Power BI uses to create its visualizations.

You can have a simple dataset that's based on a single table from a Microsoft Excel workbook, similar to what's shown in the following image.

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	B	C	D	E	F	G	H
1	Year	Month	Month Name	Calendar Month	Births	Births Per Day	Births (Normalized)
2119	2004	1	January	1/1/2004	2,937	94.7	2842
2120	2004	2	February	2/1/2004	2,824	97.4	2921
2121	2004	3	March	3/1/2004	3,128	100.9	3027
2122	2004	4	April	4/1/2004	2,896	96.5	2896
2123	2004	5	May	5/1/2004	3,008	97.0	2911
2124	2004	6	June	6/1/2004	3,047	101.6	3047
2125	2004	7	July	7/1/2004	2,981	96.2	2885
2126	2004	8	August	8/1/2004	3,079	99.3	2980
2127	2004	9	September	9/1/2004	3,219	107.3	3219
2128	2004	10	October	10/1/2004	3,547	114.4	3433
2129	2004	11	November	11/1/2004	3,365	112.2	3365
2130	2004	12	December	12/1/2004	3,143	101.4	3042
2131	2005	1	January	1/1/2005	2,921	94.2	2827
2132	2005	2	February	2/1/2005	2,699	96.4	2892
2133	2005	3	March	3/1/2005	3,024	97.5	2926
2134	2005	4	April	4/1/2005	3,037	101.2	3037
2135	2005	5	May	5/1/2005	3,231	104.2	3127
2136	2005	6	June	6/1/2005	3,163	105.4	3163
2137	2005	7	July	7/1/2005	3,119	100.6	3018
2138	2005	8	August	8/1/2005	3,156	101.8	3054
2139	2005	9	September	9/1/2005	3,439	114.6	3439

Datasets can also be a combination of many different sources, which you can filter and combine to provide a unique collection of data (a dataset) for use in Power BI.

For example, you can create a dataset from three database fields, one website table, an Excel table, and online results of an email marketing campaign. That unique combination is still considered a single **dataset**, even though it was pulled together from many different sources.

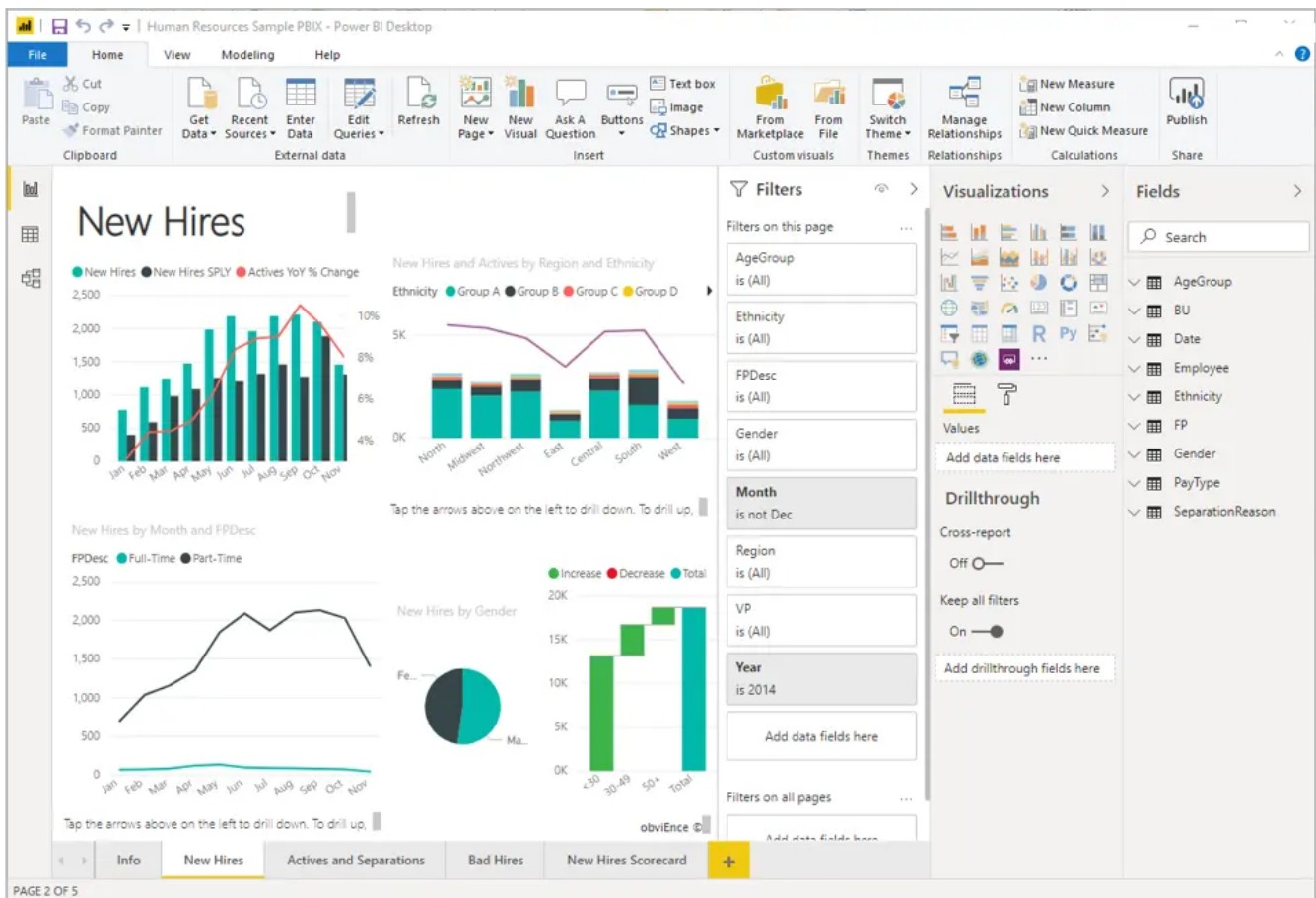
Filtering data before bringing it into Power BI lets you focus on the data that matters to you. For example, you can filter your contact database so that only customers who received emails from the marketing campaign are included in the dataset. You can then create visuals based on that subset (the filtered collection) of customers who were included in the campaign. Filtering helps you focus your data—and your efforts.

An important and enabling part of Power BI is the multitude of data **connectors** that are included. Whether the data you want is in Excel or a Microsoft SQL Server database, in Azure or Oracle, or in a service like Facebook, Salesforce, or MailChimp, Power BI has built-in data connectors that let you easily connect to that data, filter it if necessary, and bring it into your dataset.

After you have a dataset, you can begin creating visualizations that show different portions of it in different ways, and gain insights based on what you see. That's where reports come in.

Reports

In Power BI, a **report** is a collection of visualizations that appear together on one or more pages. Just like any other report you might create for a sales presentation or write for a school assignment, a report in Power BI is a collection of items that are related to each other. The following image shows a **report** in Power BI Desktop—in this case, it's the second page in a five-page report. You can also create reports in the Power BI service.



Reports let you create many visualizations, on multiple pages if necessary, and let you arrange those visualizations in whatever way best tells your story.

You might have a report about quarterly sales, product growth in a particular segment, or migration patterns of polar bears. Whatever your subject, reports let you gather and organize your visualizations onto one page (or more).

Dashboards

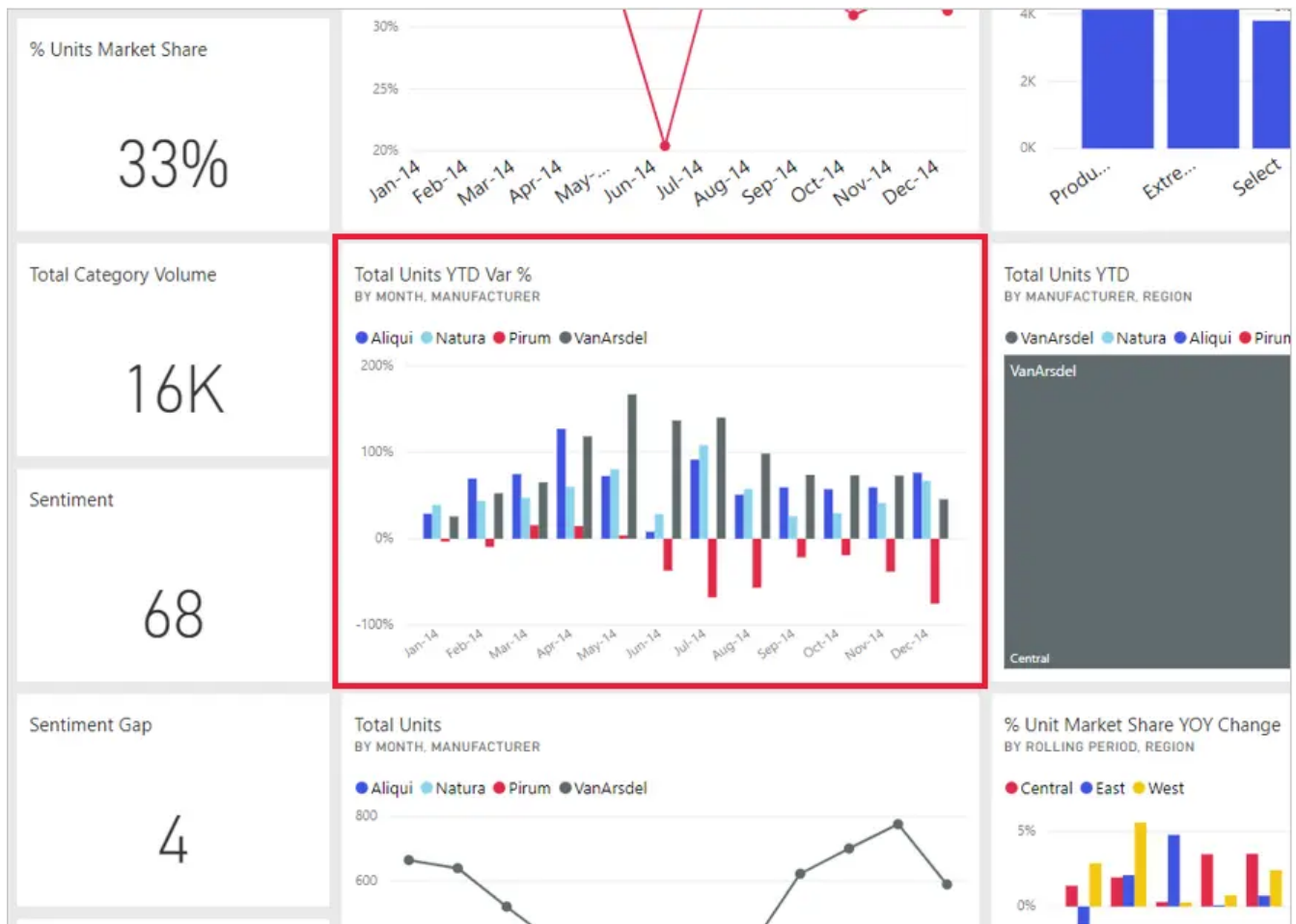
When you're ready to share a report, or a collection of visualizations, you create a **dashboard**. Much like the dashboard in a car, a Power BI **dashboard** is a collection of visuals from a single page that you can share with others. Often, it's a selected group of visuals that provide quick insight into the data or story you're trying to present.

A dashboard must fit on a single page, often called a canvas (the canvas is the blank backdrop in Power BI Desktop or the service, where you put visualizations). Think of it like the canvas that an artist or painter uses—a workspace where you create, combine, and rework interesting

and compelling visuals. You can share dashboards with other users or groups, who can then interact with your dashboards when they're in the Power BI service or on their mobile device.

Tiles

In Power BI, a **tile** is a single visualization on a dashboard. It's the rectangular box that holds an individual visual. In the following image, you see one tile, which is also surrounded by other tiles.



When you're *creating* a dashboard in Power BI, you can move or arrange tiles however you want. You can make them bigger, change their height or width, and snuggle them up to other tiles.

When you're *viewing*, or *consuming*, a dashboard or report—which means you're not the creator or owner, but the report or dashboard has been shared with you—you can interact with it, but you can't change the size of the tiles or their arrangement.

All together now

Those are the basics of Power BI and its building blocks. Let's take a moment to review.

Power BI is a collection of services, apps, and connectors that lets you connect to your data, wherever it happens to reside, filter it if necessary, and then bring it into Power BI to create compelling visualizations that you can share with others.

Now that you've learned about the handful of basic building blocks of Power BI, it should be clear that you can create datasets that make sense *to you* and create visually compelling reports that tell your story. Stories told with Power BI don't have to be complex, or complicated, to be compelling.

For some people, using a single Excel table in a dataset and then sharing a dashboard with their team will be an incredibly valuable way to use Power BI.

For others, the value of Power BI will be in using real-time Azure SQL Data Warehouse tables that combine with other databases and real-time sources to build a moment-by-moment dataset.

For both groups, the process is the same: create datasets, build compelling visuals, and share them with others. And the result is also the same for both groups: harness your ever-expanding world of data, and turn it into actionable insights.

Whether your data insights require straightforward or complex datasets, Power BI helps you get started quickly and can expand with your needs to be as complex as your world of data requires. And because Power BI is a Microsoft product, you can count on it being robust, extensible, Microsoft Office–friendly, and enterprise-ready.

Now let's see how this works. We'll start by taking a quick look at the Power BI service.

Next unit: Tour and use the Power BI service

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