Introduction
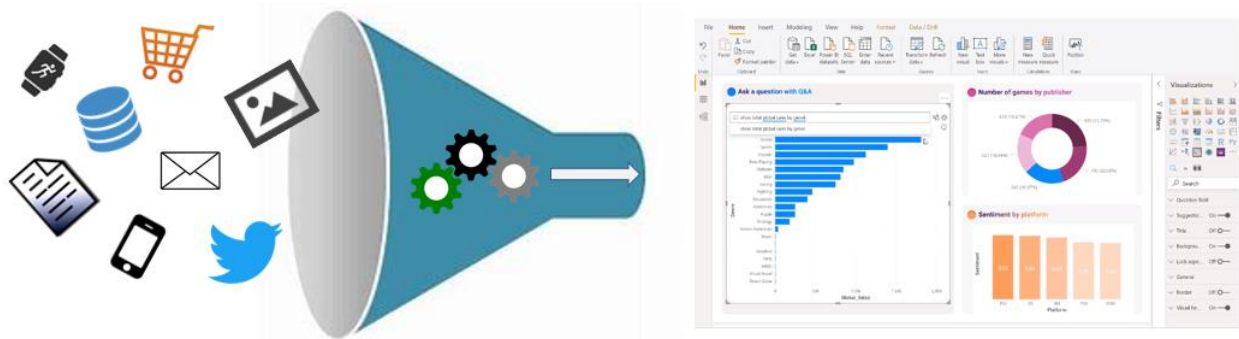
- 5 minutes

As a data analyst, you are on a journey. Think about all the data that is being generated each day and that is available in an organization, from transactional data in a traditional database, telemetry data from services that you use, to signals that you get from different areas like social media.

For example, today's retail businesses collect and store massive amounts of data that track the items you browsed and purchased, the pages you've visited on their site, the aisles you purchase products from, your spending habits, and much more.

With data and information as the most strategic asset of a business, the underlying challenge that organizations have today is understanding and using their data to positively affect change within the business. Businesses continue to struggle to use their data in a meaningful and productive way, which impacts their ability to act.

A retail business should be able to use their vast amounts of data and information in such a way that impacts the business, including:

- Tracking inventory
- Identifying purchase habits
- Detecting user trends and patterns
- Recommending purchases
- Determining price optimizations
- Identifying and stopping fraud

Additionally, you might be looking for daily/monthly sale patterns. Common data segments that you might want to examine include day-over-day, week-over-week, and

month-over-month so that you can compare how sales have been to where they were in the same week last year, for example.

The key to unlocking this data is being able to tell a story with it. In today's highly competitive and fast-paced business world, crafting reports that tell that story is what helps business leaders take action on the data. Business decision makers depend on an accurate story to drive better business decisions. The faster a business can make precise decisions, the more competitive they will be and the better advantage they will have. Without the story, it is difficult to understand what the data is trying to tell you.

However, having data alone is not enough. You need to be able to act on the data to affect change within the business. That action could involve reallocating resources within the business to accommodate a need, or it could be identifying a failing campaign and knowing when to change course. These situations are where telling a story with your data is important.

The underlying challenge that businesses face today is understanding and using their data in such a way that impacts their business and ultimately their bottom line. You need to be able to look at the data and facilitate trusted business decisions. Then, you need the ability to look at metrics and clearly understand the meaning behind those metrics.

This requirement might seem daunting, but it's a task that you can accomplish. Your first step is to partner with data experts within your organization, such as data engineers and data scientists, to help get the data that you need to tell that story. Ask these experts to participate in that data journey with you.

Your journey of telling a story with data also ties into building that data culture within your organization. While telling the story is important, *where* that story is told is also crucial, ensuring that the story is told to the right people. Also, make sure that people can discover the story, that they know where to find it, and that it is part of the regular interactions.

Data analysis exists to help overcome these challenges and pain points, ultimately assisting businesses in finding insights and uncovering hidden value in troves of data through storytelling. As you read on, you will learn how to use and apply analytical skills to go beyond a single report and help impact and influence your organization by telling stories with data and driving that data culture.

Next unit: Overview of data analysis

Overview of data analysis

Completed100 XP

- 6 minutes

Before data can be used to tell a story, it must be run through a process that makes it usable in the story. Data analysis is the process of identifying, cleaning, transforming, and modeling data to discover meaningful and useful information. The data is then crafted into a story through reports for analysis to support the critical decision-making process.

As the world becomes more data-driven, storytelling through data analysis is becoming a vital component and aspect of large and small businesses. It is the reason that organizations continue to hire data analysts.

Data-driven businesses make decisions based on the story that their data tells, and in today's data-driven world, data is not being used to its full potential, a challenge that most businesses face. Data analysis is, and should be, a critical aspect of all organizations to help determine the impact to their business, including evaluating customer sentiment, performing market and product research, and identifying trends or other data insights.

While the process of data analysis focuses on the tasks of cleaning, modeling, and visualizing data, the concept of data analysis and its importance to business should not be understated. To analyze data, core components of analytics are divided into the following categories:

- Descriptive
- Diagnostic
- Predictive
- Prescriptive
- Cognitive

Descriptive analytics

Descriptive analytics help answer questions about what has happened based on historical data. Descriptive analytics techniques summarize large datasets to describe outcomes to stakeholders.

By developing key performance indicators (KPIs), these strategies can help track the success or failure of key objectives. Metrics such as return on investment (ROI) are used in many industries, and specialized metrics are developed to track performance in specific industries.

An example of descriptive analytics is generating reports to provide a view of an organization's sales and financial data.

Diagnostic analytics

Diagnostic analytics help answer questions about why events happened. Diagnostic analytics techniques supplement basic descriptive analytics, and they use the findings from descriptive analytics to discover the cause of these events. Then, performance indicators are further investigated to discover why these events improved or became worse. Generally, this process occurs in three steps:

1. Identify anomalies in the data. These anomalies might be unexpected changes in a metric or a particular market.
2. Collect data that's related to these anomalies.
3. Use statistical techniques to discover relationships and trends that explain these anomalies.

Predictive analytics

Predictive analytics help answer questions about what will happen in the future. Predictive analytics techniques use historical data to identify trends and determine if they're likely to recur. Predictive analytical tools provide valuable insight into what might happen in the future. Techniques include a variety of statistical and machine learning techniques such as neural networks, decision trees, and regression.

Prescriptive analytics

Prescriptive analytics help answer questions about which actions should be taken to achieve a goal or target. By using insights from prescriptive analytics, organizations can make data-driven decisions. This technique allows businesses to make informed decisions in the face of uncertainty. Prescriptive analytics techniques rely on machine learning as one of the strategies to find patterns in large datasets. By analyzing past decisions and events, organizations can estimate the likelihood of different outcomes.

Cognitive analytics

Cognitive analytics attempt to draw inferences from existing data and patterns, derive conclusions based on existing knowledge bases, and then add these findings back into the knowledge base for future inferences, a self-learning feedback loop. Cognitive analytics help you learn what might happen if circumstances change and determine how you might handle these situations.

Inferences aren't structured queries based on a rules database; rather, they're unstructured hypotheses that are gathered from several sources and expressed with varying degrees of confidence. Effective cognitive analytics depend on machine learning algorithms, and will use several natural language processing concepts to make sense of previously untapped data sources, such as call center conversation logs and product reviews.

Example

By enabling reporting and data visualizations, a retail business uses descriptive analytics to look at patterns of purchases from previous years to determine what products might be popular next year. The company might also look at supporting data to understand

why a particular product was popular and if that trend is continuing, which will help them determine whether to continue stocking that product.

A business might determine that a certain product was popular over a specific timeframe. Then, they can use this analysis to determine whether certain marketing efforts or online social activities contributed to the sales increase.

An underlying facet of data analysis is that a business needs to trust its data. As a practice, the data analysis process will capture data from trusted sources and shape it into something that is consumable, meaningful, and easily understood to help with the decision-making process. Data analysis enables businesses to fully understand their data through data-driven processes and decisions, allowing them to be confident in their decisions.

As the amount of data grows, so does the need for data analysts. A data analyst knows how to organize information and distill it into something relevant and comprehensible. A data analyst knows how to gather the right data and what to do with it, in other words, making sense of the data in your data overload.

Next unit: Roles in data

Roles in data

Completed100 XP

- 8 minutes

Telling a story with the data is a journey that usually doesn't start with you. The data must come from somewhere. Getting that data into a place that is usable by you takes effort that is likely out of your scope, especially in consideration of the enterprise.

Today's applications and projects can be large and intricate, often involving the use of skills and knowledge from numerous individuals. Each person brings a unique talent and expertise, sharing in the effort of working together and coordinating tasks and responsibilities to see a project through from concept to production.

In the recent past, roles such as business analysts and business intelligence developers were the standard for data processing and understanding. However, excessive expansion of the size and different types of data has caused these roles to evolve into

more specialized sets of skills that modernize and streamline the processes of data engineering and analysis.

The following sections highlight these different roles in data and the specific responsibility in the overall spectrum of data discovery and understanding:

- Business analyst
- Data analyst
- Data engineer
- Data scientist
- Database administrator

Business analyst

While some similarities exist between a data analyst and business analyst, the key differentiator between the two roles is what they do with data. A business analyst is closer to the business and is a specialist in interpreting the data that comes from the visualization. Often, the roles of data analyst and business analyst could be the responsibility of a single person.

Data analyst

A data analyst enables businesses to maximize the value of their data assets through visualization and reporting tools such as Microsoft Power BI. Data analysts are responsible for profiling, cleaning, and transforming data. Their responsibilities also include designing and building scalable and effective data models, and enabling and implementing the advanced analytics capabilities into reports for analysis. A data analyst works with the pertinent stakeholders to identify appropriate and necessary data and

reporting requirements, and then they are tasked with turning raw data into relevant and meaningful insights.

A data analyst is also responsible for the management of Power BI assets, including reports, dashboards, workspaces, and the underlying datasets that are used in the reports. They are tasked with implementing and configuring proper security procedures, in conjunction with stakeholder requirements, to ensure the safekeeping of all Power BI assets and their data.

Data analysts work with data engineers to determine and locate appropriate data sources that meet stakeholder requirements. Additionally, data analysts work with the data engineer and database administrator to ensure that the analyst has proper access to the needed data sources. The data analyst also works with the data engineer to identify new processes or improve existing processes for collecting data for analysis.

Data engineer

Data engineers provision and set up data platform technologies that are on-premises and in the cloud. They manage and secure the flow of structured and unstructured data from multiple sources. The data platforms that they use can include relational databases, nonrelational databases, data streams, and file stores. Data engineers also ensure that data services securely and seamlessly integrate across data platforms.

Primary responsibilities of data engineers include the use of on-premises and cloud data services and tools to ingest, egress, and transform data from multiple sources. Data engineers collaborate with business stakeholders to identify and meet data requirements. They design and implement solutions.

While some alignment might exist in the tasks and responsibilities of a data engineer and a database administrator, a data engineer's scope of work goes well beyond looking after a database and the server where it's hosted and likely doesn't include the overall operational data management.

A data engineer adds tremendous value to business intelligence and data science projects. When the data engineer brings data together, often described as data wrangling, projects move faster because data scientists can focus on their own areas of work.

As a data analyst, you would work closely with a data engineer in making sure that you can access the variety of structured and unstructured data sources because they will

support you in optimizing data models, which are typically served from a modern data warehouse or data lake.

Both database administrators and business intelligence professionals can transition to a data engineer role; they need to learn the tools and technology that are used to process large amounts of data.

Data scientist

Data scientists perform advanced analytics to extract value from data. Their work can vary from descriptive analytics to predictive analytics. Descriptive analytics evaluate data through a process known as exploratory data analysis (EDA). Predictive analytics are used in machine learning to apply modeling techniques that can detect anomalies or patterns. These analytics are important parts of forecast models.

Descriptive and predictive analytics are only partial aspects of data scientists' work. Some data scientists might work in the realm of deep learning, performing iterative experiments to solve a complex data problem by using customized algorithms.

Anecdotal evidence suggests that most of the work in a data science project is spent on data wrangling and feature engineering. Data scientists can speed up the experimentation process when data engineers use their skills to successfully wrangle data.

On the surface, it might seem that a data scientist and data analyst are far apart in the work that they do, but this conjecture is untrue. A data scientist looks at data to determine the questions that need answers and will often devise a hypothesis or an experiment and then turn to the data analyst to assist with the data visualization and reporting.

Database administrator

A database administrator implements and manages the operational aspects of cloud-native and hybrid data platform solutions that are built on Microsoft Azure data services and Microsoft SQL Server. A database administrator is responsible for the overall availability and consistent performance and optimizations of the database solutions. They work with stakeholders to identify and implement the policies, tools, and processes for data backup and recovery plans.

The role of a database administrator is different from the role of a data engineer. A database administrator monitors and manages the overall health of a database and the hardware that it resides on, whereas a data engineer is involved in the process of data wrangling, in other words, ingesting, transforming, validating, and cleaning data to meet business needs and requirements.

The database administrator is also responsible for managing the overall security of the data, granting and restricting user access and privileges to the data as determined by business needs and requirements.


Next unit: Tasks of a data analyst

Tasks of a data analyst

Completed100 XP

- 10 minutes

A data analyst is one of several critical roles in an organization, who help uncover and make sense of information to keep the company balanced and operating efficiently. Therefore, it's vital that a data analyst clearly understands their responsibilities and the tasks that are performed on a near-daily basis. Data analysts are essential in helping organizations gain valuable insights into the expanse of data that they have, and they work closely with others in the organization to help reveal valuable information.

The following figure shows the five key areas that you'll engage in during the data analysis process.
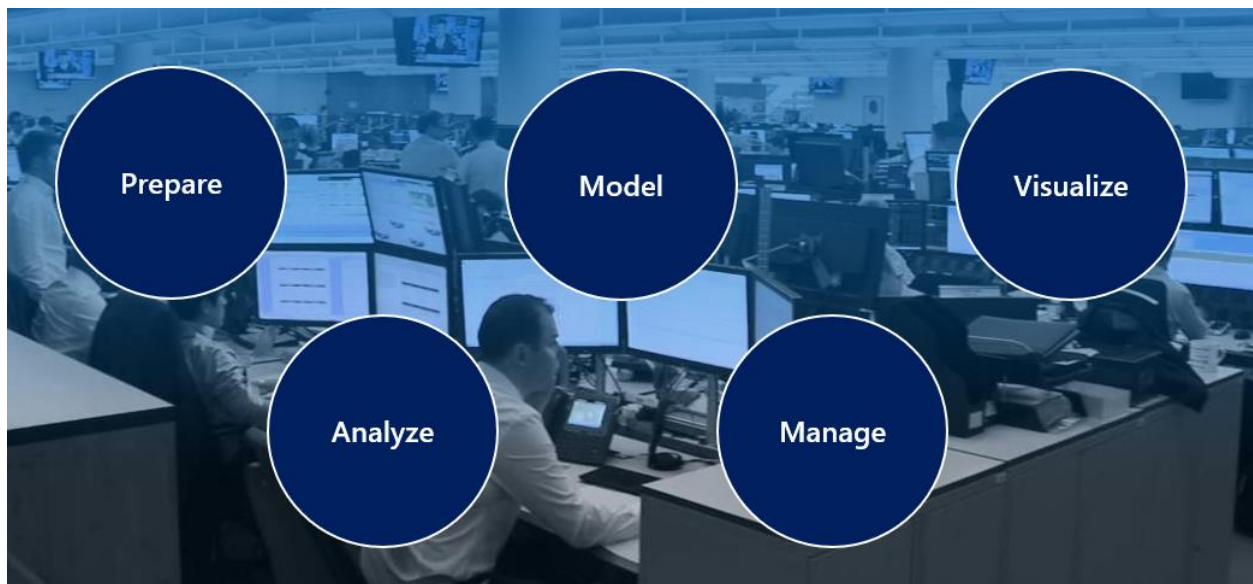
Prepare

As a data analyst, you'll likely divide most of your time between the prepare and model tasks. Deficient or incorrect data can have a major impact that results in invalid reports, a loss of trust, and a negative effect on business decisions, which can lead to loss in revenue, a negative business impact, and more.

Before a report can be created, data must be prepared. Data preparation is the process of profiling, cleaning, and transforming your data to get it ready to model and visualize.

Data preparation is the process of taking raw data and turning it into information that is trusted and understandable. It involves, among other things, ensuring the integrity of the data, correcting wrong or inaccurate data, identifying missing data, converting data from one structure to another or from one type to another, or even a task as simple as making data more readable.

Data preparation also involves understanding *how* you're going to get and connect to the data and the performance implications of the decisions. When connecting to data, you need to make decisions to ensure that models and reports meet, and perform to, acknowledged requirements and expectations.

Privacy and security assurances are also important. These assurances can include anonymizing data to avoid oversharing or preventing people from seeing personally identifiable information when it isn't needed. Alternatively, helping to ensure privacy

and security can involve removing that data completely if it doesn't fit in with the story that you're trying to shape.

Data preparation can often be a lengthy process. Data analysts follow a series of steps and methods to prepare data for placement into a proper context and state that eliminate poor data quality and allow it to be turned into valuable insights.

Model

When the data is in a proper state, it's ready to be modeled. Data modeling is the process of determining how your tables are related to each other. This process is done by defining and creating relationships between the tables. From that point, you can enhance the model by defining metrics and adding custom calculations to enrich your data.

Creating an effective and proper data model is a critical step in helping organizations understand and gain valuable insights into the data. An effective data model makes reports more accurate, allows the data to be explored faster and more efficient, decreases time for the report writing process, and simplifies future report maintenance.

The model is another critical component that has a direct effect on the performance of your report and overall data analysis. A poorly designed model can have a drastically negative impact on the general accuracy and performance of your report. Conversely, a well-designed model with well-prepared data will ensure a properly efficient and trusted report. This notion is more prevalent when you are working with data at scale.

From a Power BI perspective, if your report is performing slowly, or your refreshes are taking a long time, you will likely need to revisit the data preparation and modeling tasks to optimize your report.

The process of preparing data and modeling data is an iterative process. Data preparation is the first task in data analysis. Understanding and preparing your data before you model it will make the modeling step much easier.

Visualize

The visualization task is where you get to bring your data to life. The ultimate goal of the visualize task is to solve business problems. A well-designed report should tell a compelling story about that data, which will enable business decision makers to quickly

gain needed insights. By using appropriate visualizations and interactions, you can provide an effective report that guides the reader through the content quickly and efficiently, therefore allowing the reader to follow a narrative into the data.

The reports that are created during the visualization task help businesses and decision makers understand what that data means so that accurate and vital decisions can be made. Reports drive the overall actions, decisions, and behaviors of an organization that is trusting and relying on the information that is discovered in the data.

The business might communicate that they need all data points on a given report to help them make decisions. As a data analyst, you should take the time to fully understand the problem that the business is trying to solve. Determine whether all their data points are necessary because too much data can make detecting key points difficult. Having a small and concise data story can help find insights quickly.

With the built-in AI capabilities in Power BI, data analysts can build powerful reports, without writing any code, that enable users to get insights and answers and find actionable objectives. The AI capabilities in Power BI, such as the built-in AI visuals, enable the discovering of data by asking questions, using the Quick Insights feature, or creating machine learning models directly within Power BI.

An important aspect of visualizing data is designing and creating reports for accessibility. As you build reports, it is important to think about people who will be accessing and reading the reports. Reports should be designed with accessibility in mind from the outset so that no special modifications are needed in the future.

Many components of your report will help with storytelling. From a color scheme that is complementary and accessible, to fonts and sizing, to picking the right visuals for what is being displayed, they all come together to tell that story.

Analyze

The analyze task is the important step of understanding and interpreting the information that is displayed on the report. In your role as a data analyst, you should understand the analytical capabilities of Power BI and use those capabilities to find insights, identify patterns and trends, predict outcomes, and then communicate those insights in a way that everyone can understand.

Advanced analytics enables businesses and organizations to ultimately drive better decisions throughout the business and create actionable insights and meaningful

results. With advanced analytics, organizations can drill into the data to predict future patterns and trends, identify activities and behaviors, and enable businesses to ask the appropriate questions about their data.

Previously, analyzing data was a difficult and intricate process that was typically performed by data engineers or data scientists. Today, Power BI makes data analysis accessible, which simplifies the data analysis process. Users can quickly gain insights into their data by using visuals and metrics directly from their desktop and then publish those insights to dashboards so that others can find needed information.

This feature is another area where AI integrations within Power BI can take your analysis to the next level. Integrations with Azure machine learning, cognitive services, and built-in AI visuals will help to enrich your data and analysis.

Manage

Power BI consists of many components, including reports, dashboards, workspaces, datasets, and more. As a data analyst, you are responsible for the management of these Power BI assets, overseeing the sharing and distribution of items, such as reports and dashboards, and ensuring the security of Power BI assets.

Apps can be a valuable distribution method for your content and allow easier management for large audiences. This feature also allows you to have custom navigation experiences and link to other assets within your organization to complement your reports.

The management of your content helps to foster collaboration between teams and individuals. Sharing and discovery of your content is important for the right people to get the answers that they need. It is also important to help ensure that items are secure. You want to make sure that the right people have access and that you are not leaking data past the correct stakeholders.

Proper management can also help reduce data silos within your organization. Data duplication can make managing and introducing data latency difficult when resources are overused. Power BI helps reduce data silos with the use of shared datasets, and it allows you to reuse data that you have prepared and modeled. For key business data, endorsing a dataset as certified can help to ensure trust in that data.

The management of Power BI assets helps reduce the duplication of efforts and helps ensure security of the data.

Next unit: Check your knowledge

Check your knowledge

Completed 200 XP

- 6 minutes

Answer the following questions to see what you've learned.

1.

Which data role enables advanced analytics capabilities specifically through reports and visualizations?

○

Data scientist

○

Data engineer

○

Data analyst

A data analyst uses appropriate visuals to help business decision makers gain deep and meaningful insights from data.

2.

Which data analyst task has a critical performance impact on reporting and data analysis?

○

Model

An optimized and tuned data model performs better and provides a better data analysis experience.

○

Analyze

○

Visualize

3.

Which one of the following options is the most important key benefit of data analysis?

○

Decisive analytics

○

Informed business decisions
A key benefit of data analysis is the ability to gain valuable insights from a business's data assets to make timely and optimal business decisions.

○

Complex reports

Next unit: Summary

Summary

_{Completed}100 XP

- 1 minute

In this module, you learned that the role of data analyst is vital to the success of an organization. Additionally, the tasks that data analysts perform help ensure that the business decisions are based on trusted data. You also learned about the different roles in data and how the people in these roles work closely with a data analyst to deliver valuable insights into a business's data assets.

Module complete:

Introduction

_{Completed}100 XP

- 6 minutes

Microsoft Power BI is a collection of software services, apps, and connectors that work together to turn your unrelated sources of data into coherent, visually immersive, and interactive insights. Whether your data is a simple Microsoft Excel workbook, or a collection of cloud-based and on-premises hybrid data warehouses, **Power BI** lets you

easily connect to your data sources, visualize (or discover) what's important, and share that with anyone or everyone you want.


Power BI can be simple and fast, capable of creating quick insights from an Excel workbook or a local database. But **Power BI** is also robust and enterprise-grade, ready not only for extensive modeling and real-time analytics, but also for custom development. Therefore, it can be your personal report and visualization tool, but can also serve as the analytics and decision engine behind group projects, divisions, or entire corporations.

If you're a **beginner** with Power BI, this module will get you going. If you're a Power BI **veteran**, this module will tie concepts together and fill in the gaps.

The parts of Power BI

Power BI consists of a Microsoft Windows desktop application called **Power BI Desktop**, an online SaaS (*Software as a Service*) service called the **Power BI service**, and mobile Power BI **apps** that are available on any device, with native mobile BI apps for Windows, iOS, and Android.
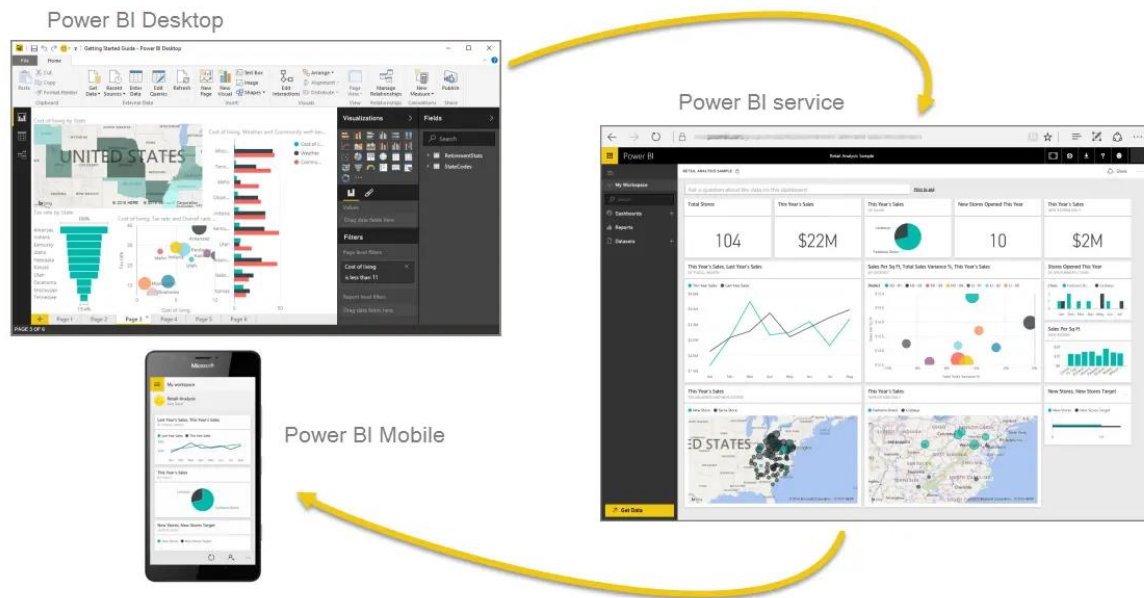
These three elements—**Desktop**, the **service**, and **Mobile** apps—are designed to let people create, share, and consume business insights in the way that serves them, or their role, most effectively.

How Power BI matches your role

How you use Power BI might depend on your role on a project or a team. And other people, in other roles, might use Power BI differently, which is just fine.

For example, you might view reports and dashboards in the **Power BI service**, and that might be all you do with Power BI. But your number-crunching, business-report-creating coworker might make extensive use of **Power BI Desktop** (and publish Power BI Desktop reports to the Power BI service, which you then use to view them). And another coworker, in sales, might mainly use her Power BI phone app to monitor progress on her sales quotas and drill into new sales lead details.

You also might use each element of **Power BI** at different times, depending on what you're trying to achieve, or what your role is for a given project or effort.

Perhaps you view inventory and manufacturing progress in a real-time dashboard in the service, and also use **Power BI Desktop** to create reports for your own team about customer engagement statistics. How you use Power BI can depend on which feature or service of Power BI is the best tool for your situation. But each part of Power BI is available to you, which is why it's so flexible and compelling.

We discuss these three elements—**Desktop**, the **service**, and **Mobile** apps—in more detail later. In upcoming units and modules, we'll also create reports in Power BI Desktop, share them in the service, and eventually drill into them on our mobile device.

Download Power BI Desktop

You can download Power BI Desktop from the web or as an app from the Microsoft Store on the Windows tab.

Download Strategy	Link	Notes
Windows Store App	[Windows Store](#)	Will automatically stay updated
Download from web	[Download .msi](#)	Must manually update periodically

Sign in to Power BI service

Before you can sign in to Power BI, you'll need an account. To get a free trial, go to [app.powerbi.com](#) and sign up with your email address.

For detailed steps on setting up an account, see [Sign in to Power BI service](#)

The flow of work in Power BI

A common flow of work in Power BI begins in **Power BI Desktop**, where a report is created. That report is then published to the **Power BI service** and finally shared, so that users of **Power BI Mobile** apps can consume the information.

It doesn't always happen that way, and that's okay. But we'll use that flow to help you learn the different parts of Power BI and how they complement each other.

Okay, now that we have an overview of this module, what Power BI is, and its three main elements, let's take a look at what it's like to use **Power BI**.


Next unit: Use Power BI

Use Power BI

- 2 minutes

Now that we've introduced the basics of Microsoft Power BI, let's jump into some hands-on experiences and a guided tour.

The activities and analyses that you'll learn with Power BI generally follow a common flow. The **common flow** of activity looks like this:

1. Bring data into Power BI Desktop, and create a report.
2. Publish to the Power BI service, where you can create new visualizations or build dashboards.
3. Share dashboards with others, especially people who are on the go.
4. View and interact with shared dashboards and reports in Power BI Mobile apps.
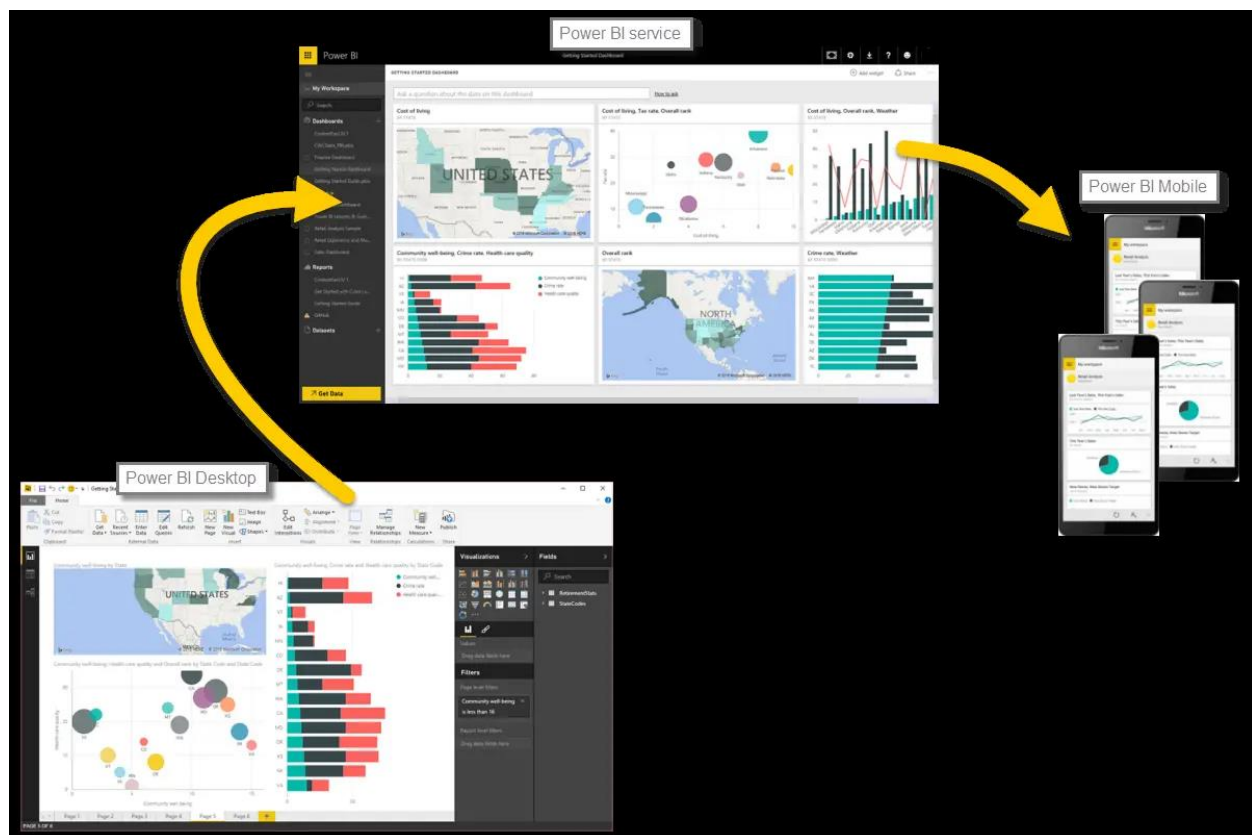
As mentioned earlier, you might spend all your time in the **Power BI service**, viewing visuals and reports that have been created by others. And that's fine. Someone else on your team might spend their time in **Power BI Desktop**, which is fine too. To help you

understand the full continuum of Power BI and what it can do, we'll show you all of it. Then you can decide how to use it to your best advantage.

So, let's jump in and step through the experience. Your first order of business is to learn the basic building blocks of Power BI, which will provide a solid basis for turning data into cool reports and visuals.

Next unit: Building blocks of Power BI

Building blocks of Power BI

_{Completed}100 XP

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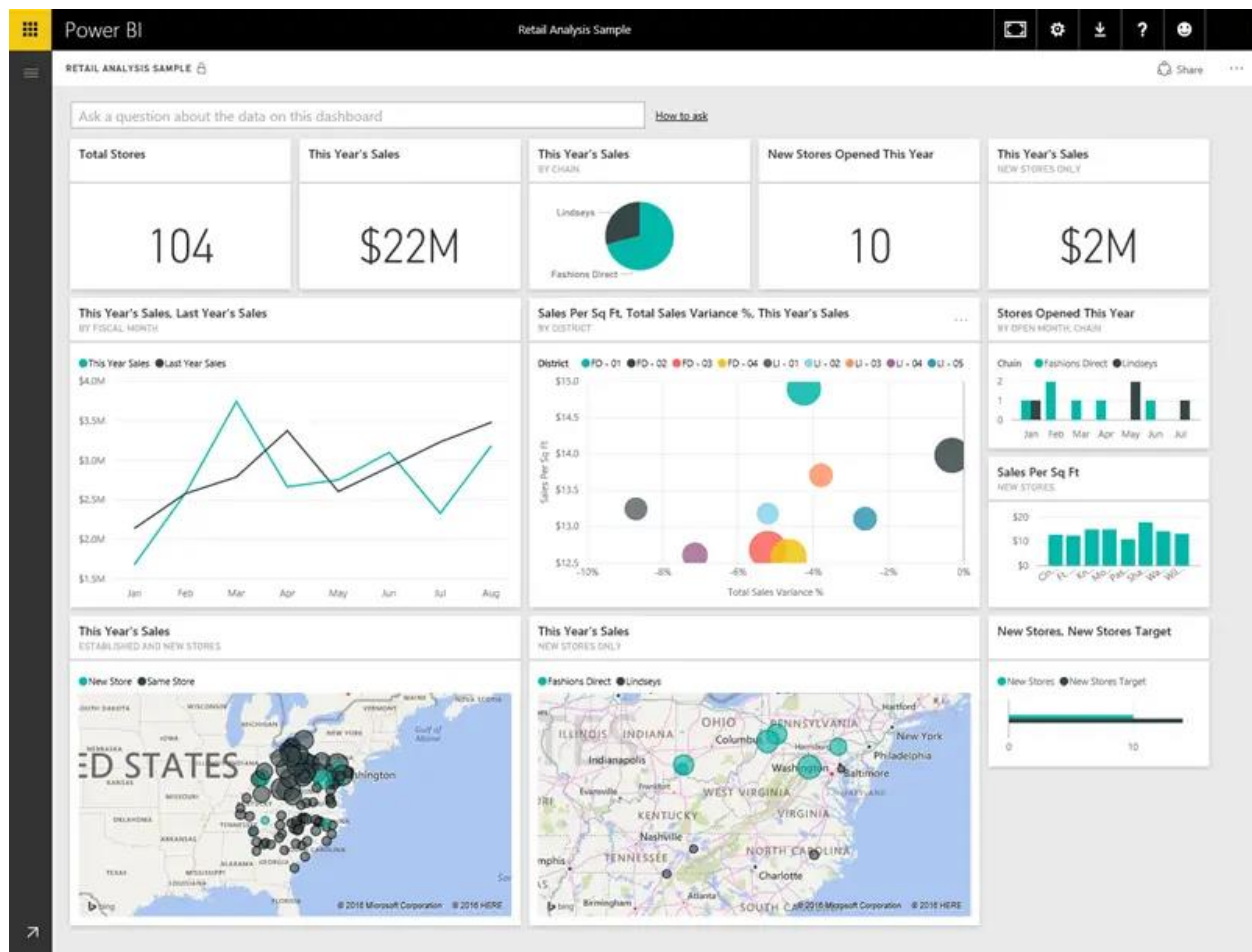
Visualizations can be simple, like a single number that represents something significant, or they can be visually complex, like a gradient-colored map that shows voter sentiment about a certain social issue or concern. The goal of a visual is to present data in a way that provides context and insights,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

	B	C	D	E	F	G	H
	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.
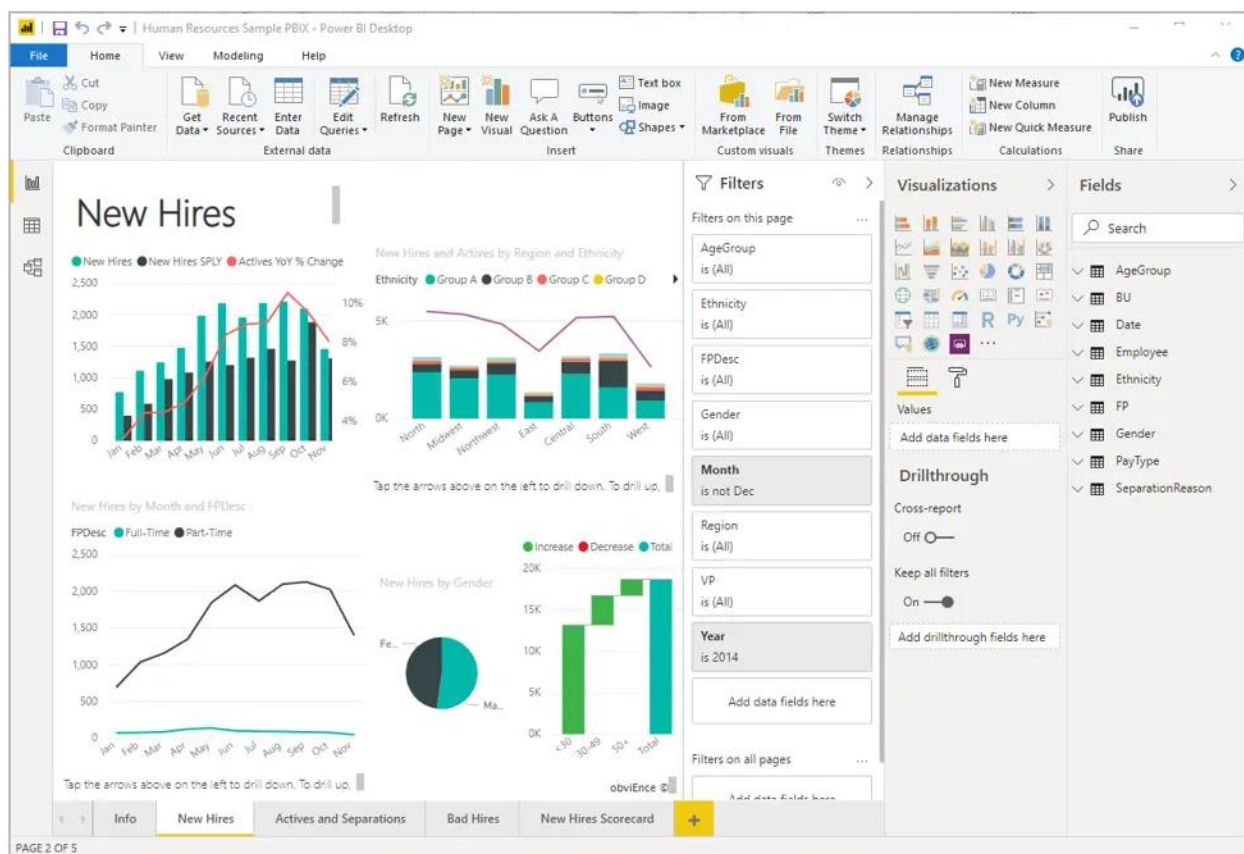
Reports let you create many visualizations, on multiple pages if necessary, and let you arrange those visualizations in whatever way best tells your story.

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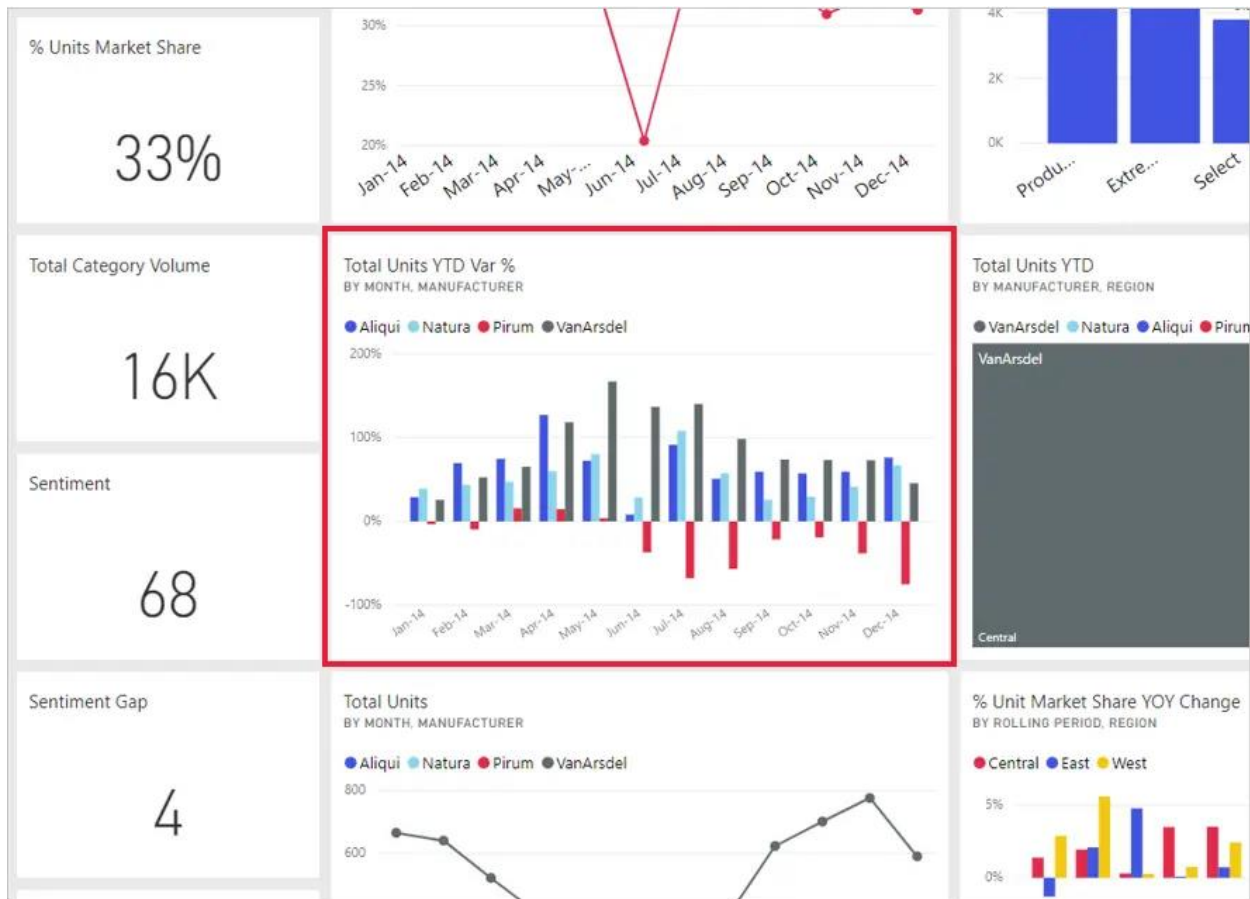
When you're *creating* a dashboard in Power BI, you can move or arrange tiles however you want. You can make them bigger, change their height or width, and snuggle them up to other tiles.

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

Tour and use the Power BI service

Completed100 XP

- 12 minutes

As we learned in the previous unit, the common flow of work in Microsoft Power BI is to create a report in Power BI Desktop, publish it to the Power BI service, and then share it with others, so that they can view it in the service or on a mobile app.

But because some people begin in the Power BI service, let's take a quick look at that first, and learn about an easy and popular way to quickly create visuals in Power BI: *apps*.

An **app** is a collection of preset, ready-made visuals and reports that are shared with an entire organization. Using an app is like microwaving a TV dinner or ordering a fast-food value meal: you just have to press a few buttons or make a few comments, and you're

quickly served a collection of entrees designed to go together, all presented in a tidy, ready-to-consume package.

So, let's take a quick look at apps, the service, and how it works. We'll go into more detail about apps (and the service) in upcoming modules, but you can think of this as a taste to whet your appetite. You can sign into the service at https://powerbi.microsoft.com.

Create out-of-box dashboards with cloud services

With Power BI, connecting to data is easy. From the Power BI service, you can just select the **Get Data** button in the lower-left corner of the home page.
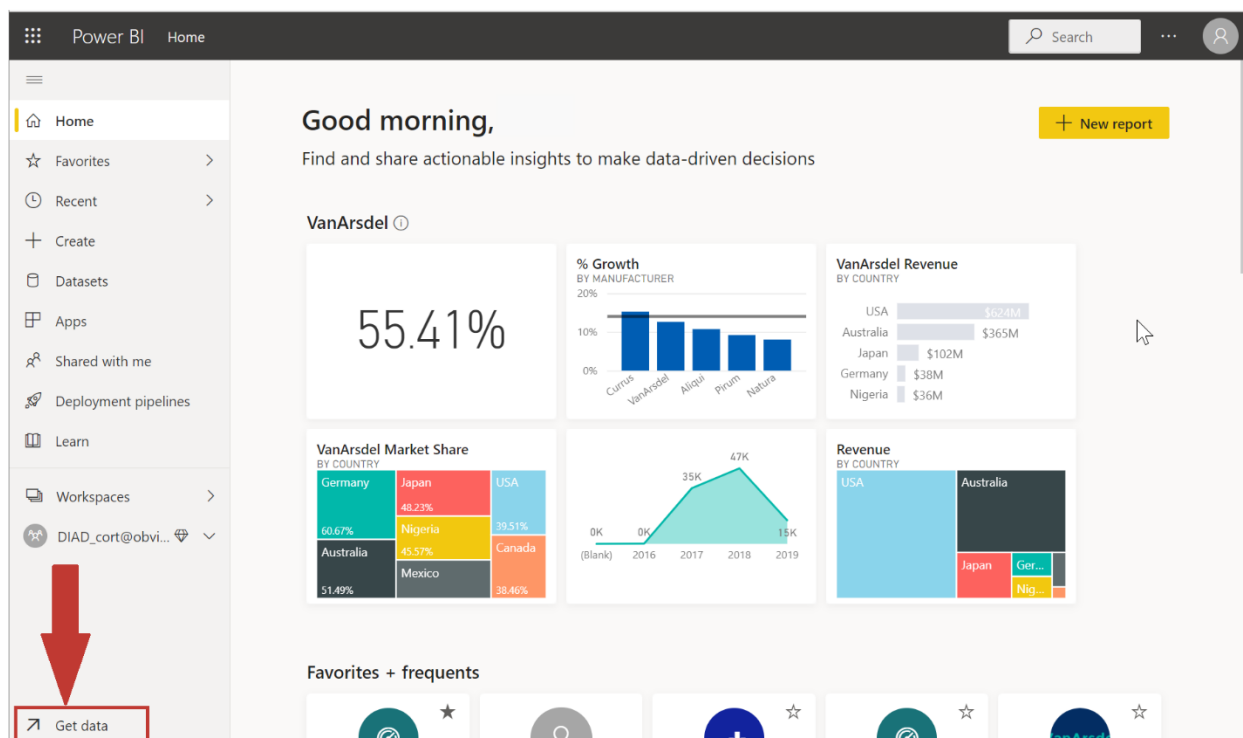
The *canvas* (the area in the center of the Power BI service) shows you the available sources of data in the Power BI service. In addition to common data sources like Microsoft Excel files, databases, or Microsoft Azure data, Power BI can just as easily connect to a whole assortment of **software services** (also called SaaS providers or cloud services): Salesforce, Facebook, Google Analytics, and more.
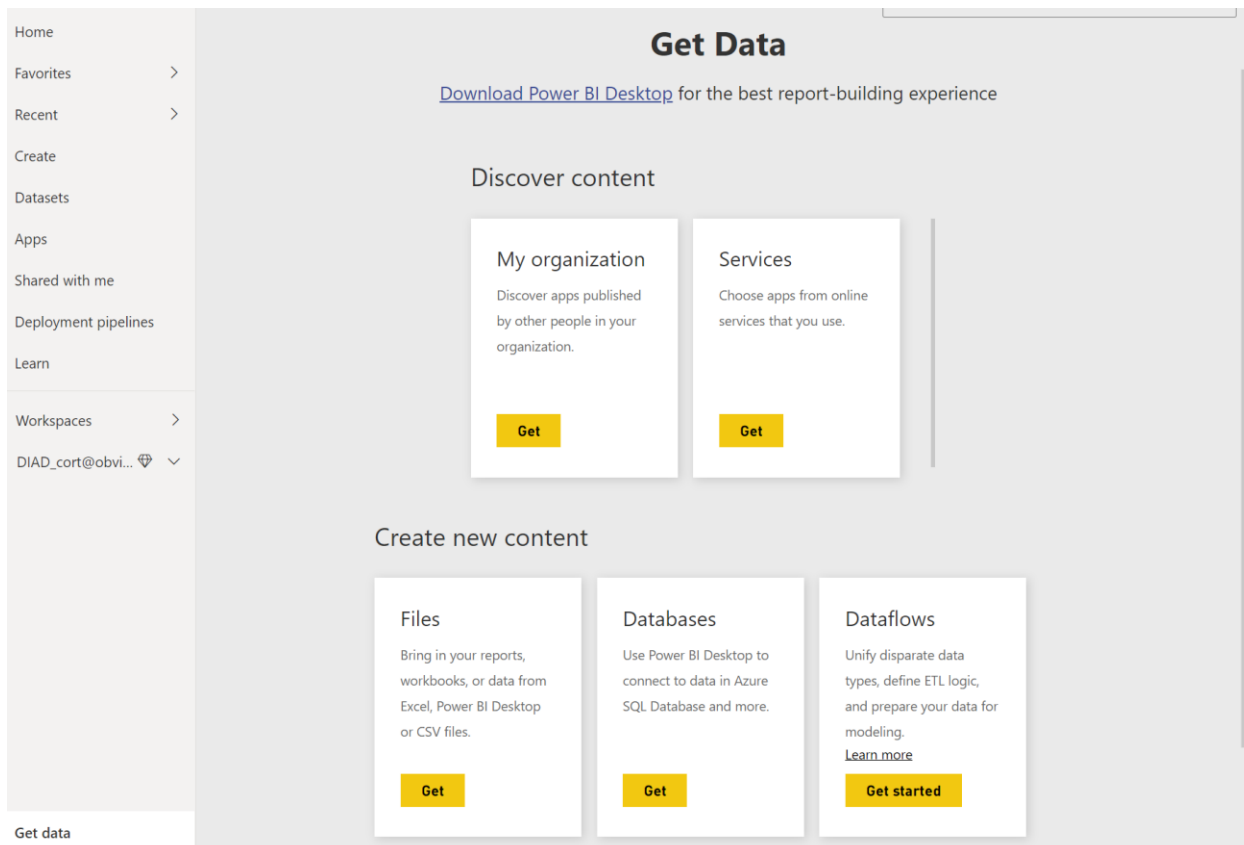
For these software services, the **Power BI service** provides a collection of ready-made visuals that are pre-arranged on dashboards and reports for your organization. This collection of visuals is called an **app**. Apps get you up and running quickly, with data and dashboards that your organization has created for you. For example, when you use the GitHub app, Power BI connects to your GitHub account (after you provide your credentials) and then populates a predefined collection of visuals and dashboards in Power BI.

There are apps for all sorts of online services. The following image shows a page of apps that are available for different online services, in alphabetical order. This page is shown when you select the **Get** button in the **Services** box (shown in the previous image). As you can see from the following image, there are many apps to choose from.
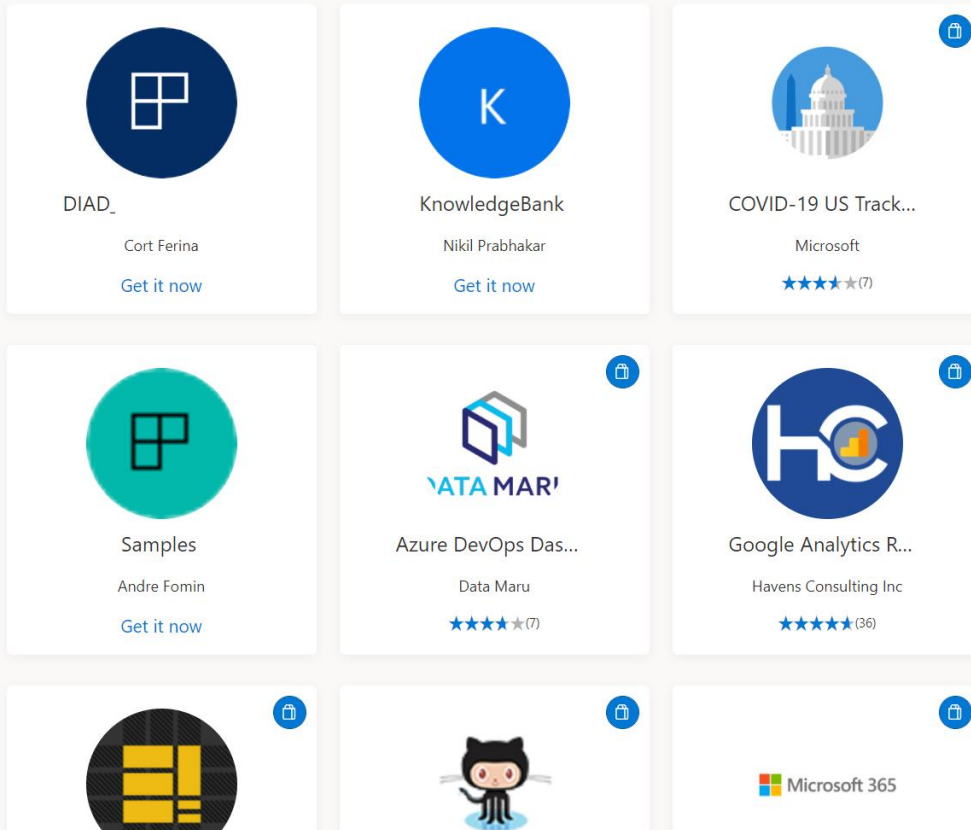
For our purposes, we'll choose **GitHub**. Note that the GitHub app requires Power BI Pro. GitHub is an application for online source control. When you select the **Get it now** button in the box for the GitHub app, the **Connect to GitHub** dialog box appears. Note that GitHub does not support Internet Explorer, so make sure you are working in another browser.

One more thing ...

Github Repository Usage
By Microsoft

This app requires some basic profile information. We have pulled your Microsoft Account data to help you get started. AppSource will save your information for next time.

Name *	
Work email *	
Job title	
Company	
Country / region *	United States
Phone number *	

☑ I give Microsoft permission to use or share my account information so that the provider or Microsoft can contact me regarding this product and related products. I agree to the provider's terms of use and privacy policy and understand that the rights to use this product do not come from Microsoft, unless Microsoft is the provider. Use of AppSource is governed by separate terms and privacy.

Continue

After you enter the information and credentials for the GitHub app, installation of the app begins.
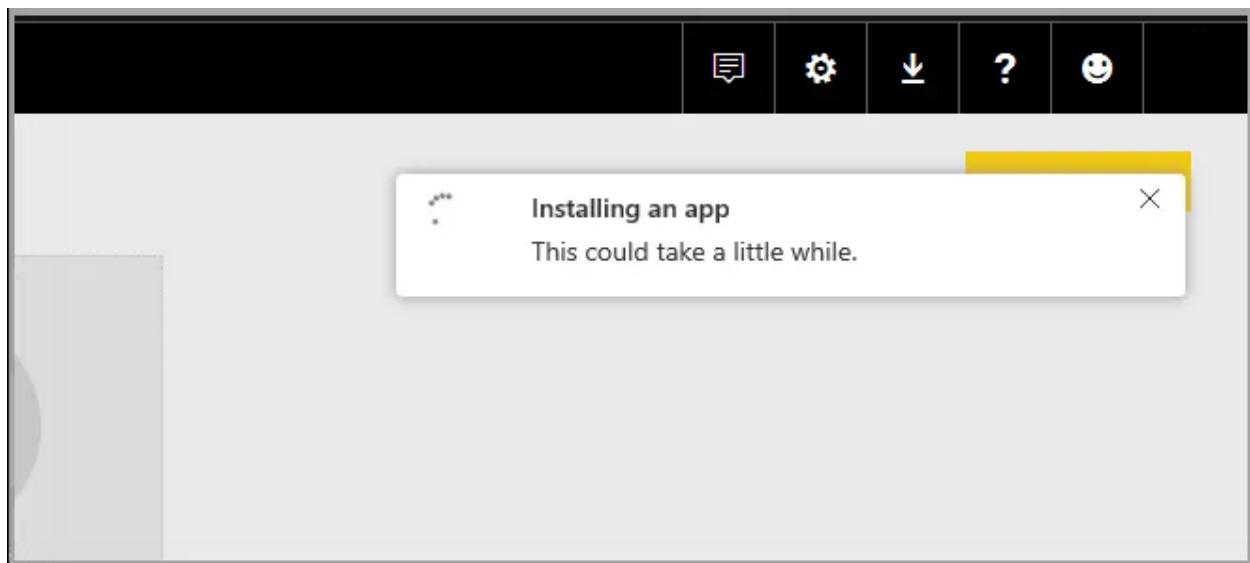
After the data is loaded, the predefined GitHub app dashboard appears.
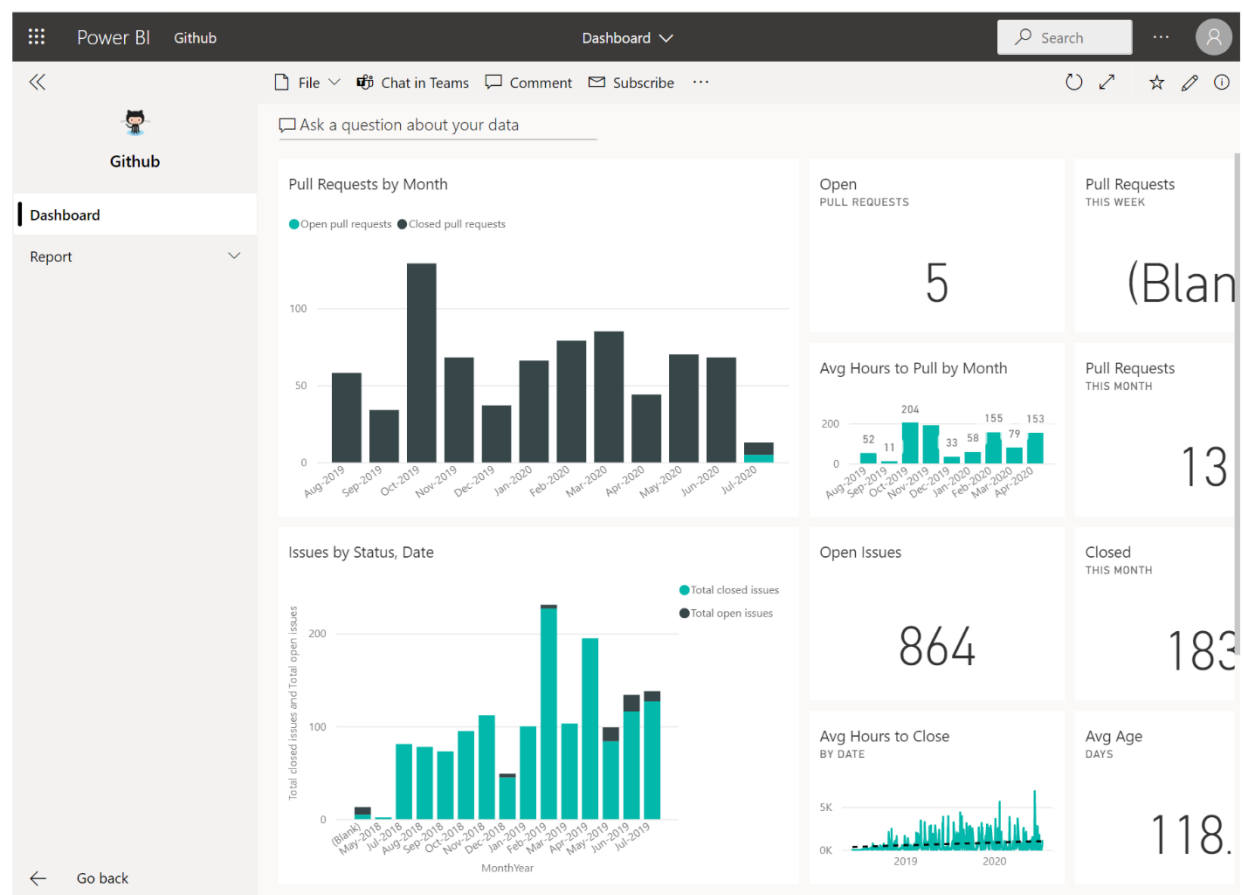

In addition to the app **dashboard**, the **report** that was generated (as part of the GitHub app) and used to create the dashboard is available, as is the **dataset** (the collection of

data pulled from GitHub) that was created during data import and used to create the GitHub report.
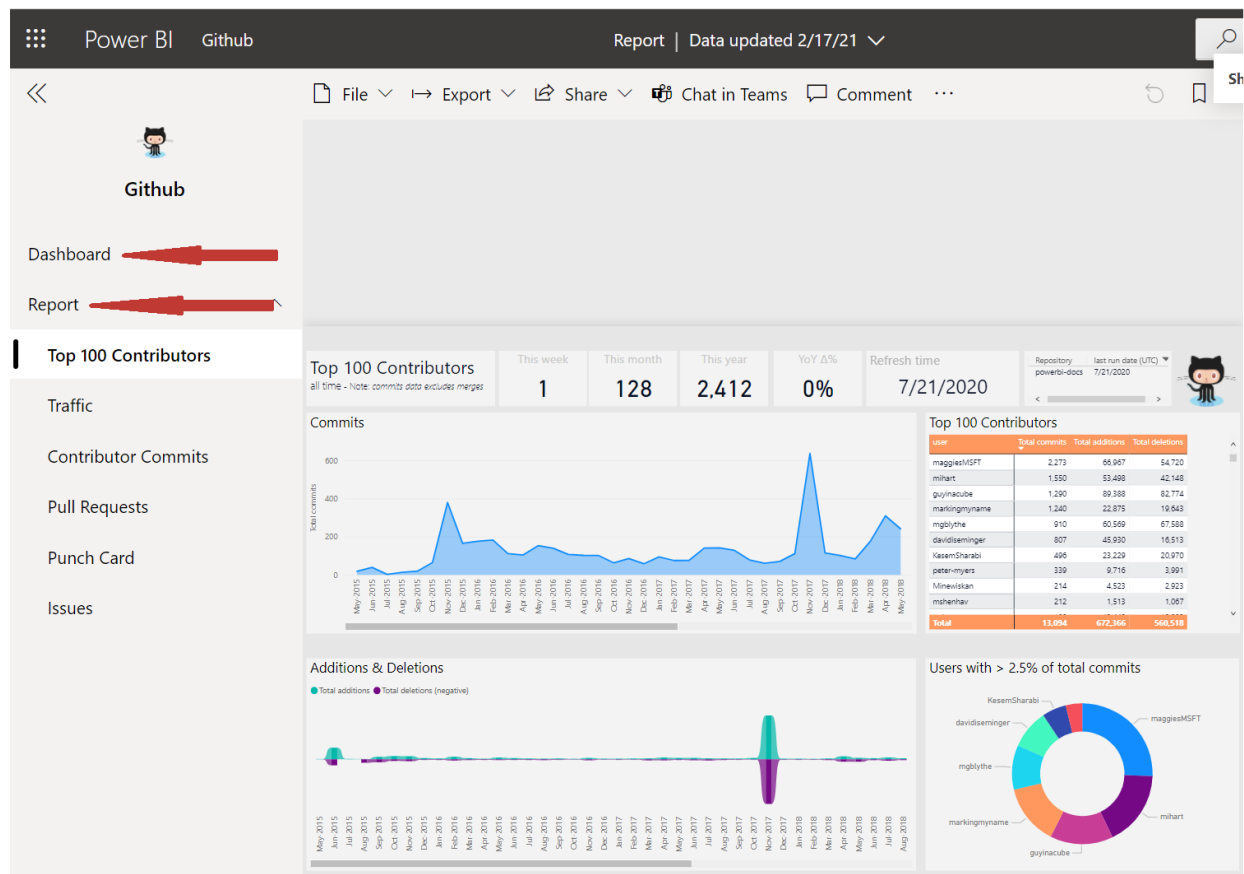
You can select any of the visuals and interact with them. If you click on a section in one visual, all the other visuals on the page will filter accordingly. For example, when you click on **MIHART** in the donut chart on the **Pull Requests** report, the other visuals on the page adjust to reflect that selection.
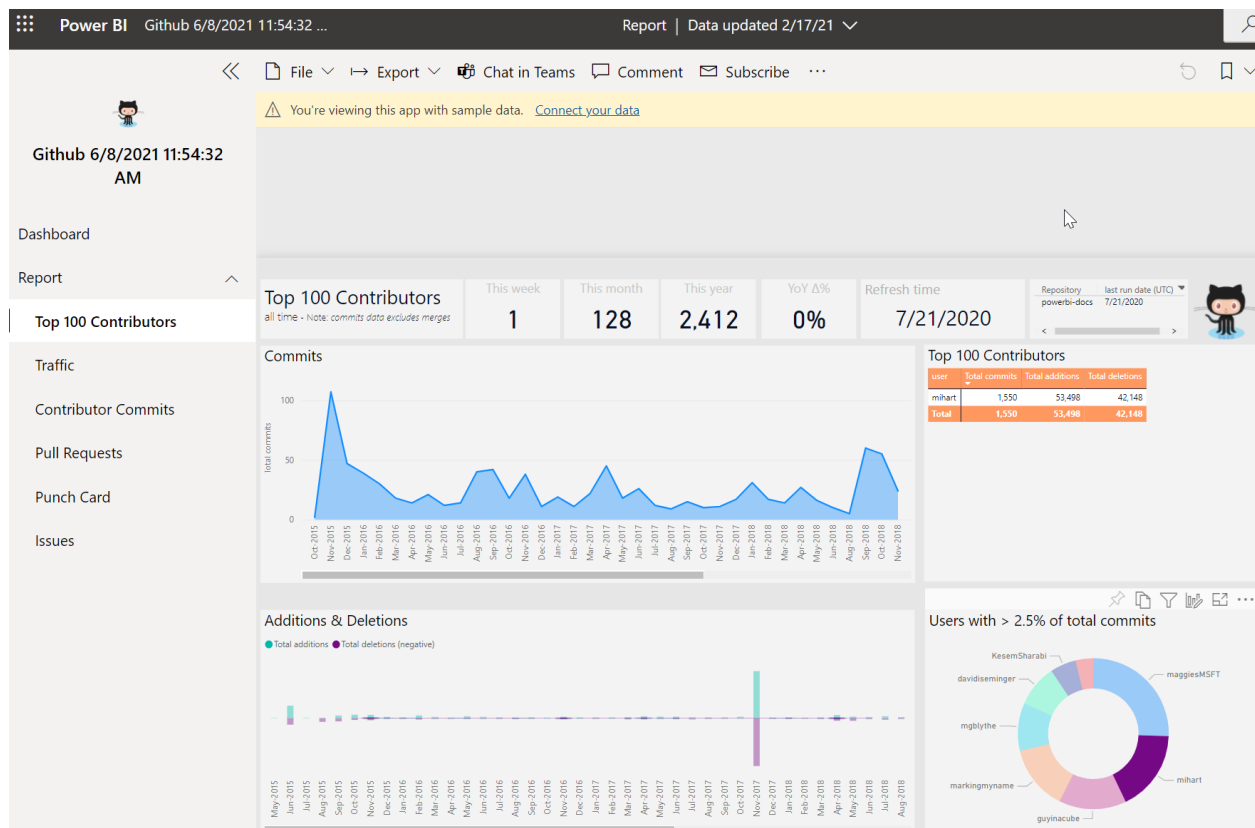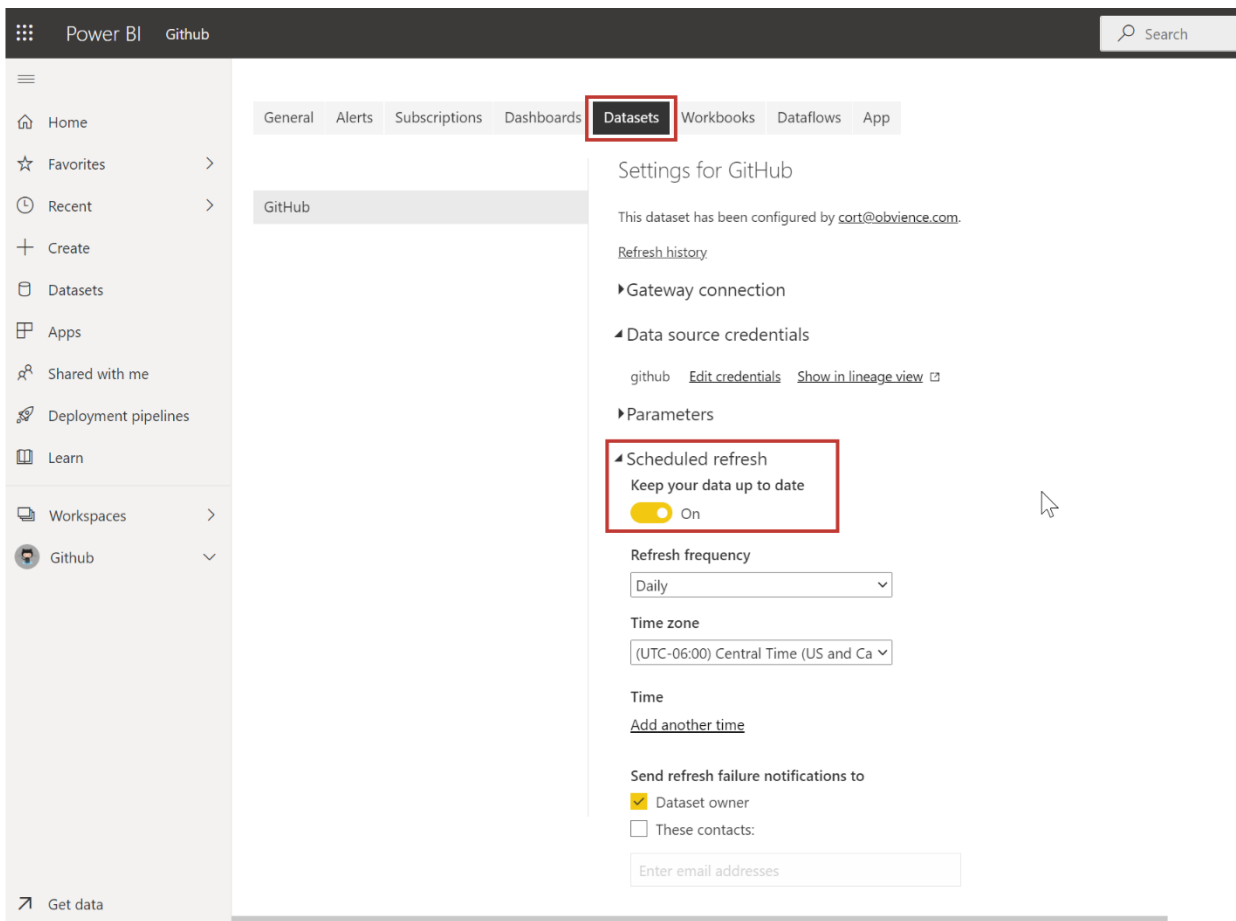
Update data in the Power BI service

You can also choose to **update** the dataset for an app, or other data that you use in Power BI. To set update settings, select the schedule update icon for the dataset to update, and then use the menu that appears. You can also select the update icon (the circle with an arrow) next to the schedule update icon to update the dataset immediately.
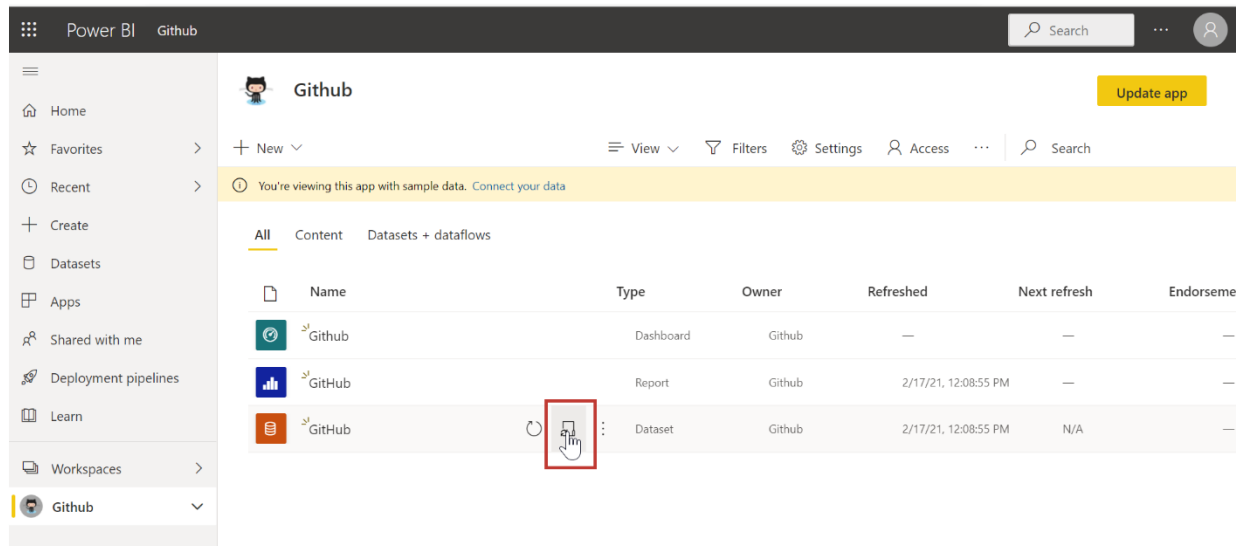
The **Datasets** tab is selected on the **Settings** page that appears. In the right pane, select the arrow next to **Scheduled refresh** to expand that section. The **Settings** dialog box appears on the canvas, letting you set the update settings that meet your needs.

That's enough for our quick look at the Power BI service. There are many more things you can do with the service, and we'll cover these later in this module and in upcoming modules. Also, remember that there are many types of data you can connect to, and all sorts of apps, with more of both coming all the time.


Next unit: Summary

Summary

- 5 minutes

Let's do a quick review of what we covered in this module.

Microsoft Power BI is a collection of software services, apps, and connectors that work together to turn your data into interactive insights. You can use data from single basic sources, like a Microsoft Excel workbook, or pull in data from multiple databases and cloud sources to create complex datasets and reports. Power BI can be as straightforward as you want or as enterprise-ready as your complex global business requires.

Power BI consists of three main elements—**Power BI Desktop**, the **Power BI service**, and **Power BI Mobile**—which work together to let you create, interact with, share, and consume your data the way you want.
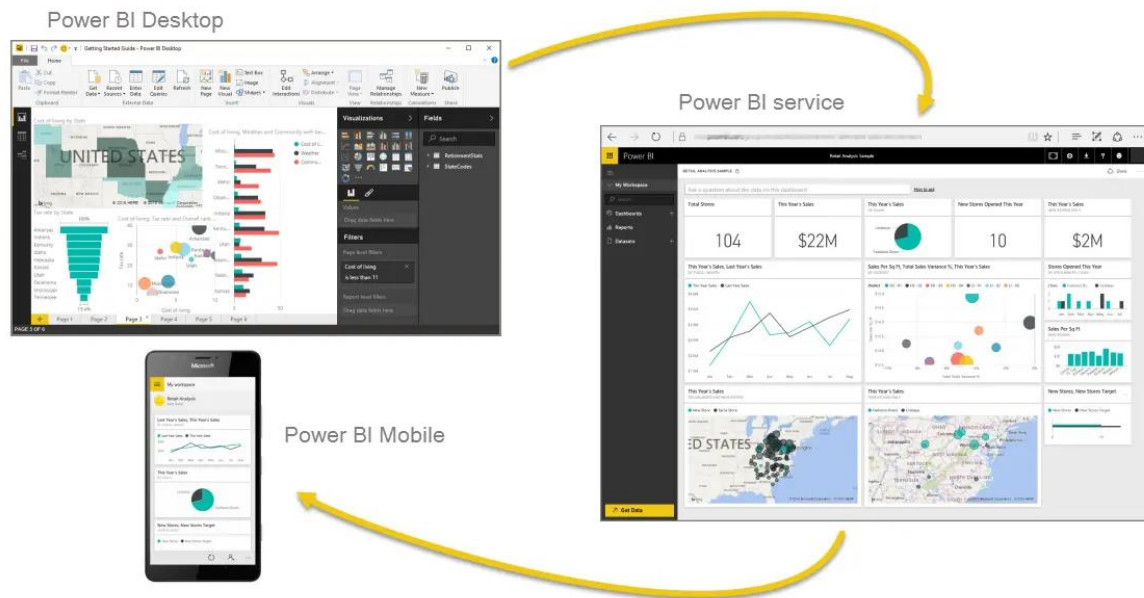
We also discussed the basic building blocks in Power BI:

- **Visualizations** – A visual representation of data, sometimes just called visuals
- **Datasets** – A collection of data that Power BI uses to create visualizations
- **Reports** – A collection of visuals from a dataset, spanning one or more pages
- **Dashboards** – A single-page collection of visuals built from a report
- **Tiles** – Snapshots of your data on a dashboard

In the **Power BI service**, we installed an **app** in just a few clicks. That **app**, a ready-made collection of visuals and reports, let us easily connect to a **software service** to populate the app and bring that data to life.

Finally, we set up a **refresh schedule** for our data, so that we know the data will be fresh when we go back to the Power BI service.

Next steps

Congratulations! You've finished the first module of the **learning path** for Power BI. You now have a firm foundation of knowledge for when you move on to the next module, which walks through the steps to create your first report.

We mentioned this before, but it's worth restating: this learning path builds your knowledge by following the common flow of work in Power BI:

- Bring data into **Power BI Desktop**, and create a report.
- **Publish** to the Power BI service, where you create new visualizations or build dashboards.
- **Share** your dashboards with others, especially people who are on the go.
- View and interact with shared dashboards and reports in **Power BI Mobile** apps.
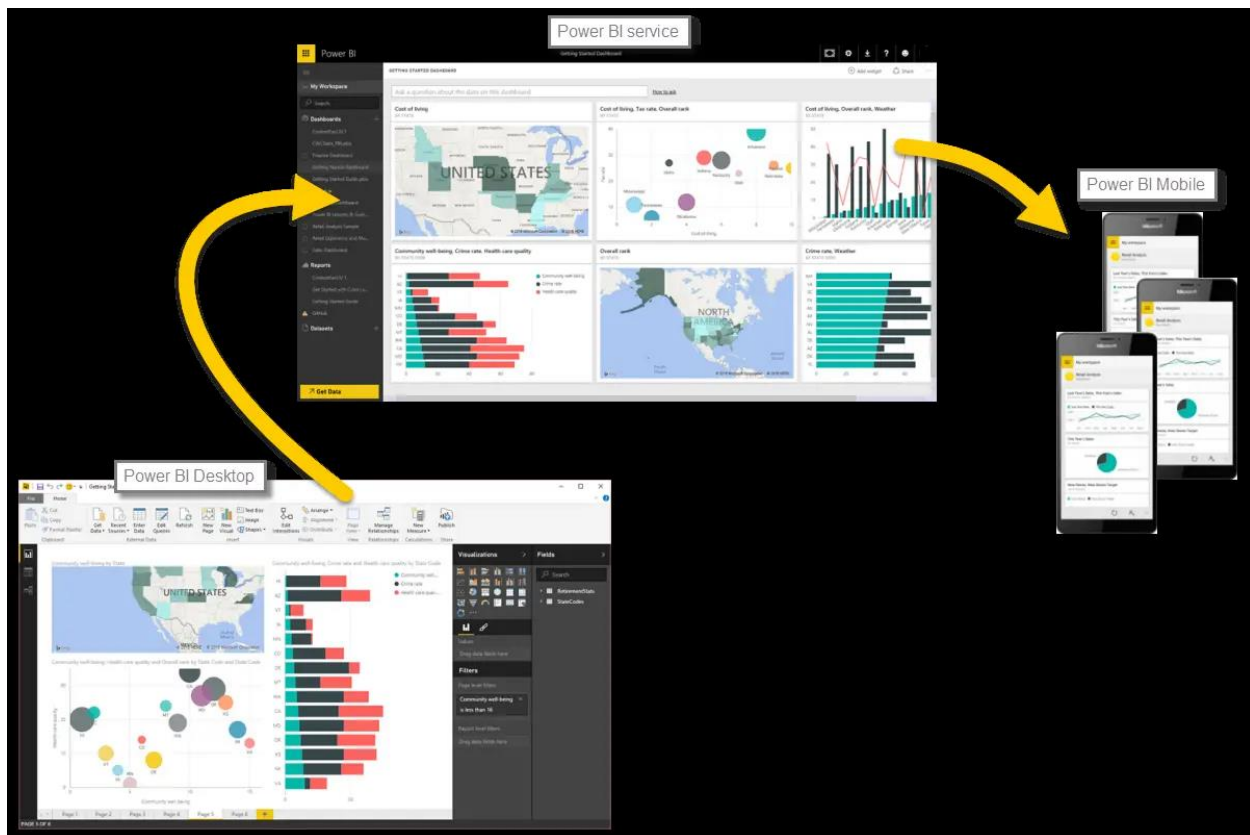
You might not do all that work yourself—some people will only view dashboards that were created by someone else, and they'll just use the service. That's fine, and we'll soon have a module dedicated to showing how you can easily navigate and use the **Power BI service** to view and interact with reports and apps.

But the next module follows the flow of work in Power BI, showing you how to create a report and publish it to the Power BI service. You'll learn how those reports and dashboards are created and how they are connected to the data. You might even decide to create a report or dashboard of your own.

See you in the next module!

Check your knowledge

- 3 minutes

Knowledge check Get started with Power BI

1.

What is the common flow of activity in Power BI?

○

Create a report in Power BI mobile, share it to the Power BI Desktop, view and interact in the Power BI service.

○

Create a report in the Power BI service, share it to Power BI mobile, interact with it in Power BI Desktop.

○

Bring data into Power BI Desktop and create a report, share it to the Power BI service, view and interact with reports and dashboards in the service and Power BI mobile.
The Power BI service lets you view and interact with reports and dashboards, but doesn't let you shape data.

○

Bring data into Power BI mobile, create a report, then share it to Power BI Desktop.
2.

Which of the following are building blocks of Power BI?

○

Tiles, dashboards, databases, mobile devices.

○

Visualizations, datasets, reports, dashboards, tiles.
Building blocks for Power BI are visualizations, datasets, reports, dashboards, tiles.

○

Visual Studio, C#, and JSON files.
3.

A collection of ready-made visuals, pre-arranged in dashboards and reports is called what in Power BI?

○

The canvas.

○

Scheduled refresh.

○

An app.

An app is a collection of ready-made visuals, pre-arranged in dashboards and reports. You can get apps that connect to many online services from the AppSource.