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# Define **Analytics**:

## The changing role of BI's favorite catch-all term

# The Skinny on Analytics

Dealing with business data is not a new phenomenon. Twenty years ago, we relied on highly trained technical specialists to make sense of database modeling, which left analytics to large enterprises with time on their hands—and even then, insights were outdated the minute they were printed on paper. They weren't actionable at all. But today, businesses of all sizes can connect to and analyze data (even big data) to educate each other and drive better business decisions. With interactive visualizations and dashboards that improve both analysis and understanding, people are making better decisions backed by data. What used to take days and weeks to discover now takes minutes, and the impact is bigger.

For the analyst, the goal remains the same: to explore data and discover opportunities, answering questions that arise along the way. As an analyst, you already know that data makes proving a point easier, but only if that data is relevant and understandable. How do you make data relevant? Data analysis. How do you make analysis understandable? Visualization. The natural combination of these elements makes data analysis visual and easy to share.

From startup to enterprise, organizations have begun to empower its people to leverage data to make informed decisions, which is reflected in the increased adoption of self-service visual BI solutions.<sup>1</sup> These solutions not only give analysts and business decision-makers the insight they need, but also facilitate smarter decision-making in record time.<sup>2</sup> In fact, the demand for analytics skills is so high, higher education institutions have built analytics-specific programs, with **business analytics programs growing the fastest**. Self-service vendors have flooded the market to try and meet this demand, all the while endeavoring to stand out—often with a slew of interchangeable or unclear market terms.

Analytics, data analysis, business analytics, data discovery, visualization, advanced analytics... what's the difference? How do these concepts intersect? Should you even care? To stay on top of the alphabet soup, we'll dive into the key terms and phrases that attempt to define analytics today, and outline the features of a successful platform. Then you can get to the good stuff: putting your data to work.

<sup>1</sup> Magic Quadrant for Business Intelligence and Analytics Platforms, Gartner, 2017

<sup>2</sup> Passlick, Jens, Benedikt Lebek, and Michael H. Breitner. "A Self-Service Supporting Business Intelligence and Big Data Analytics Architecture." (2017).

# Visual Analytics

*'viZH(ōō)əl ,anə'lidiks*

noun

Data access, discovery, exploration, and information-sharing elevated by visual interactivity.

Data analysis and visualization were once separate steps. You, the analyst, would run queries or write calculations to get answers from a data source, and then export results as a specified chart or graph. But by making data discovery—the process, itself—visual, you explore your data in a richer, more meaningful way. With visual analytics, you shine the light on possibilities for displaying your data in ways you might not have otherwise considered.

By making the process of data discovery visual, you get observable feedback as you analyze. This puts the power of exploration in your hands, so you can work the way you think. When you can build an analysis and learn from it simultaneously, opportunities for investigation present themselves. In this way, visual analytics makes asking and answering questions of your data intuitive, even as those questions naturally grow in complexity—as we continue to ask **“Why?”** This is sometimes referred to as **ad-hoc analytics**, being able to answer questions of your data spontaneously, whether or not you embarked on your data analysis journey with those particular questions in mind.

When sharing, the power of the visual can be further extended to increase comprehension, leveraging **visual best practices** in your analytics to take cues from what we’ve learned conducting visual analysis of artwork.<sup>3</sup> In other words, how data visualizations are encoded by color, shape, and size matter for better delivering its value to viewers, so you should format your visualizations properly to best communicate your findings and encourage others to dig in.

Visual analytics, then, is not the same as visualization. Visualization represents data passively, communicating only one story. But with advances in computing power and data accessibility, we have the ability to answer questions with visual support along the way, and then to share interactive results with others—expediting and **improving quality communication and joint decision-making** on data.

For analysts and data scientists, who are looking for outliers, trends, and conducting exploratory analysis, the built-in tools that support this ad-hoc, visual analytical journey become increasingly important—which brings us to yet another industry-favorite term: advanced analytics.

<sup>3</sup> According to [Duke University](#), “The purpose of a **visual analysis** is to recognize and understand the visual choices the artist made in creating the artwork. By observing and writing about separate parts of the art object, you will come to a better understanding of the art object as a whole.”

# Advanced Analytics

əd' vanst ,anə'lidiks

noun

Smart, automated, or otherwise advanced data access, discovery, exploration, and information-sharing, meant to push the boundaries of traditional analytics.

Advanced analytic techniques help us discover deeper insights from data, make predictions (**predictive analytics**), and offer recommendations (**smart analytics** or **prescriptive analytics**). From a standalone definition, it's hard to tell what exactly constitutes “advanced” from table-stakes analytical capabilities.

This is because the phrase “advanced analytics” has become something of a BI industry enigma—simultaneously referring to (1) types of analyses not usually attempted by business users, like forecasting and visualization, and (2) complex tasks often facilitated by scripting languages, machine learning, neural networks, and multivariate statistics.

*“Tableau empowers the whole organization. It brings advanced analytics into the hands of people who don't necessarily have an analyst's or programmer's skill set.”*

For this reason, data scientists, who belong to the second group, might consider a standard visual analytics tool as incapable of advanced analytics; whereas the sophisticated business user or analyst (or “citizen data scientist,” as dubbed by **Gartner**) could find advanced analytical capabilities in almost any visual analytics software solution.

So although the list varies user to user, these are the advanced analytic must-haves in visual analytics tools today:

- Segmentation and Cohort Analysis
- Scenario and What-If Analysis
- Sophisticated Calculations
- Time-Series and Predictive Analysis
- External Services Integration

— ALEXS THOMPSON, PH.D.,  
DATA SCIENTIST AT HALLMARK CARDS

To learn more about the features that address these scenarios, read [Advanced Analytics with Tableau](#).

While useful for answering complex questions, these techniques are only successful if their outputs can be easily consumed by others. For instance, you should be able to leverage models created in R or Python in your visual analytics. By making your analysis visual and interactive, you extend it to viewers unfamiliar with statistical programming languages—and empower them to answer their own questions in real time.

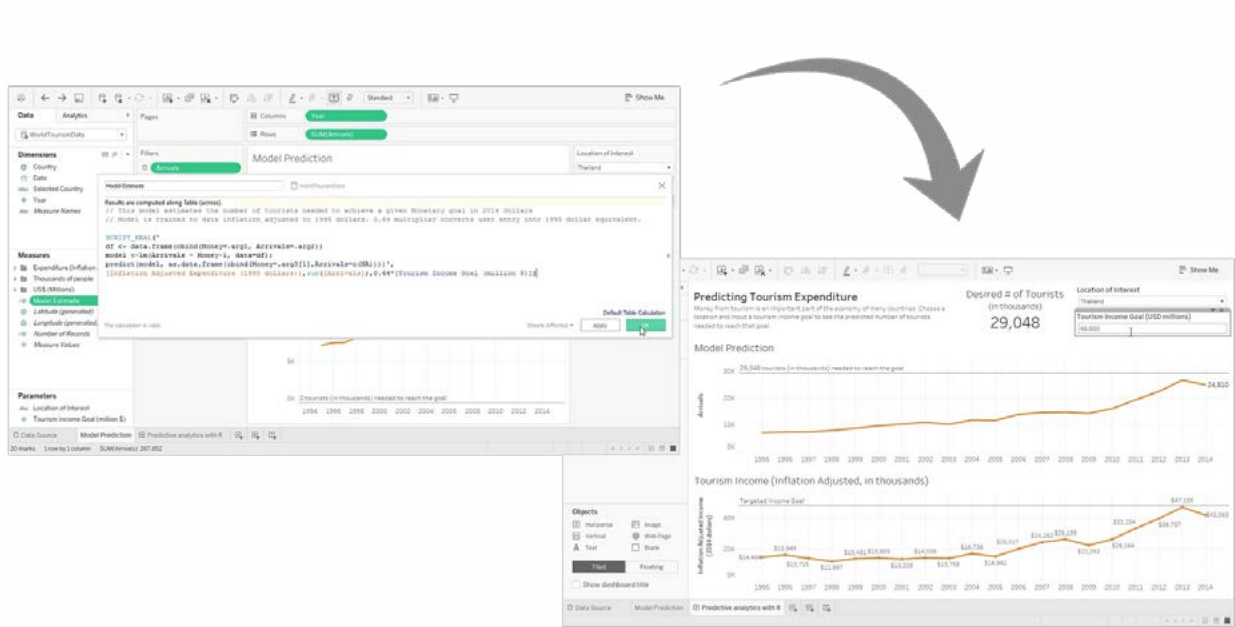


Figure 1: By scripting R directly in a visual analytics tool like Tableau, you (1) perform multiple linear regression—in this case, to discover how many tourists are required to reach a specific income goal, (2) empower users to set their own parameters and resulting scripts in R, and (3) easily and immediately communicate visual results.

The sweet spot for analytics software, then, accounts for both advanced and visual analytic features gracefully. Today, data analysis skills are expected of almost all people in a business,<sup>4</sup> so the software needs to be smart enough to account for a wide range of skill sets.

<sup>4</sup>Top Skills That Can Get You Hired, LinkedIn, 2016

# The Cycle of Analytics

*THə 'sɪk(ə)l əv ,anə'lidɪks*

noun

The stages associated with data access, discovery, exploration, and information sharing.

As humans, we solve problems in a predictable way; we iterate through ideas and questions searching for answers. Analytics is no different. It's a process, and should be designed to mirror the way we think. Analytics begins with asking questions of your data, and includes sharing the insights you discover, but those don't have to be end points.

You might search for relevant data sets, conduct analyses, share various findings with coworkers, incorporate feedback, and try new approaches: Every step is part of your analytics. You can think of this process as linear, but it's more common to revisit certain stages as you learn more about your data and the questions you're really trying to answer. In accounting for these evolving questions and changing expectations, another market term is born: the **cycle of analytics**.

As you select a platform to meet your analytics needs, it's important to ensure that all steps within this process are supported, as they will allow you to more fully and completely deliver the most value from your analytics.



Figure 2: The cycle of analytics

Figure 2 shows that there are five primary stages in the cycle of analytics, from accessing data to sharing and iterating on resulting visualizations and dashboards. What is the goal of each stage, and what software features and functionalities help us progress from one stage to the next?

### 1. Access & View

- a. **Goal:** To connect to the data that matters, wherever it's stored, and optimize it for analysis by combining it with related data sources and cleaning messy data.
- b. **Features and functionalities to look for:** Data connectors to easily connect to data—on-premises or in the cloud—whether it's big data, a SQL database, a spreadsheet, or cloud apps like Google and Salesforce. Preparation and integration functions (joins, unions), without writing code, to transform your data. The ability to pivot, split, and manage metadata to prepare it for analysis.

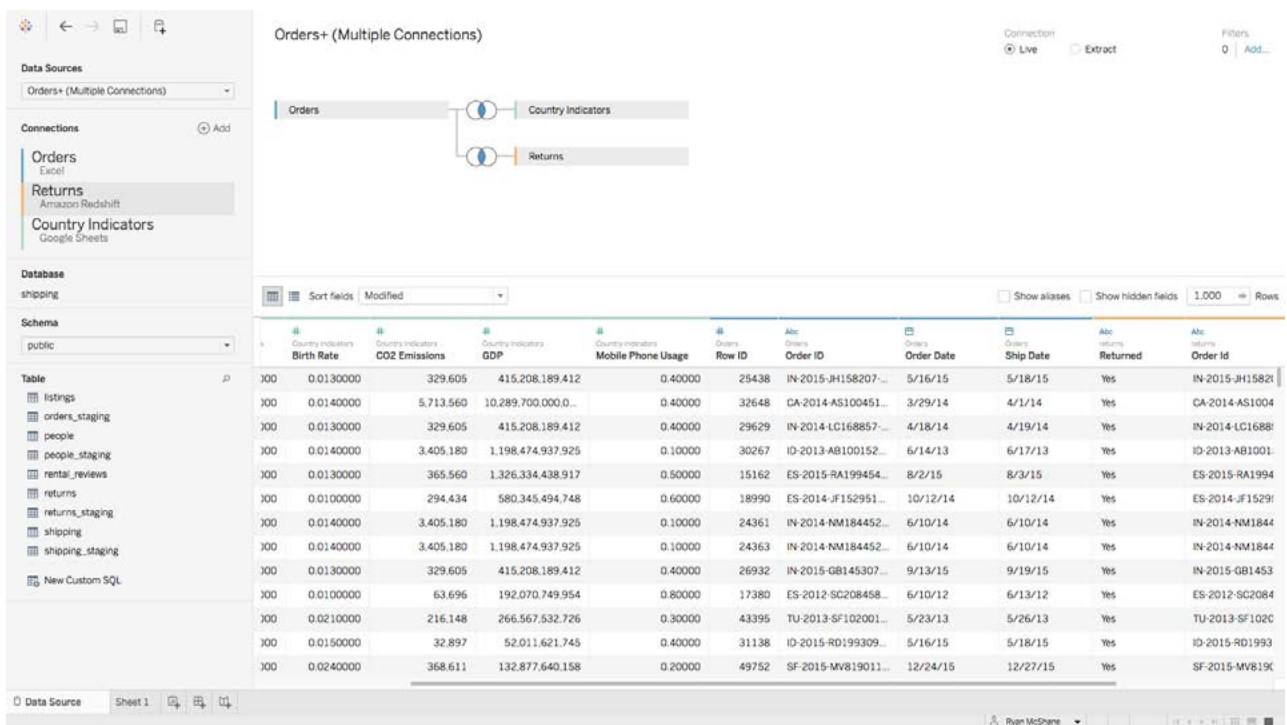


Figure 3: Built-in cross-database joins let you connect to all the data you need for your analysis, regardless of where it lives.

### Interact

- a. **Goal:** To instantly visualize the fields in your data to gain a better understanding of its structure and ability to answer the questions you have.
- b. **Features and functionalities to look for:** Visual data discovery or query language (like **VizQL**) that automatically visualizes fields from any data set as charts and graphs. Intuitive interface that encourages limitless exploration, **multiple options for charts and graphs**, and trial and error.

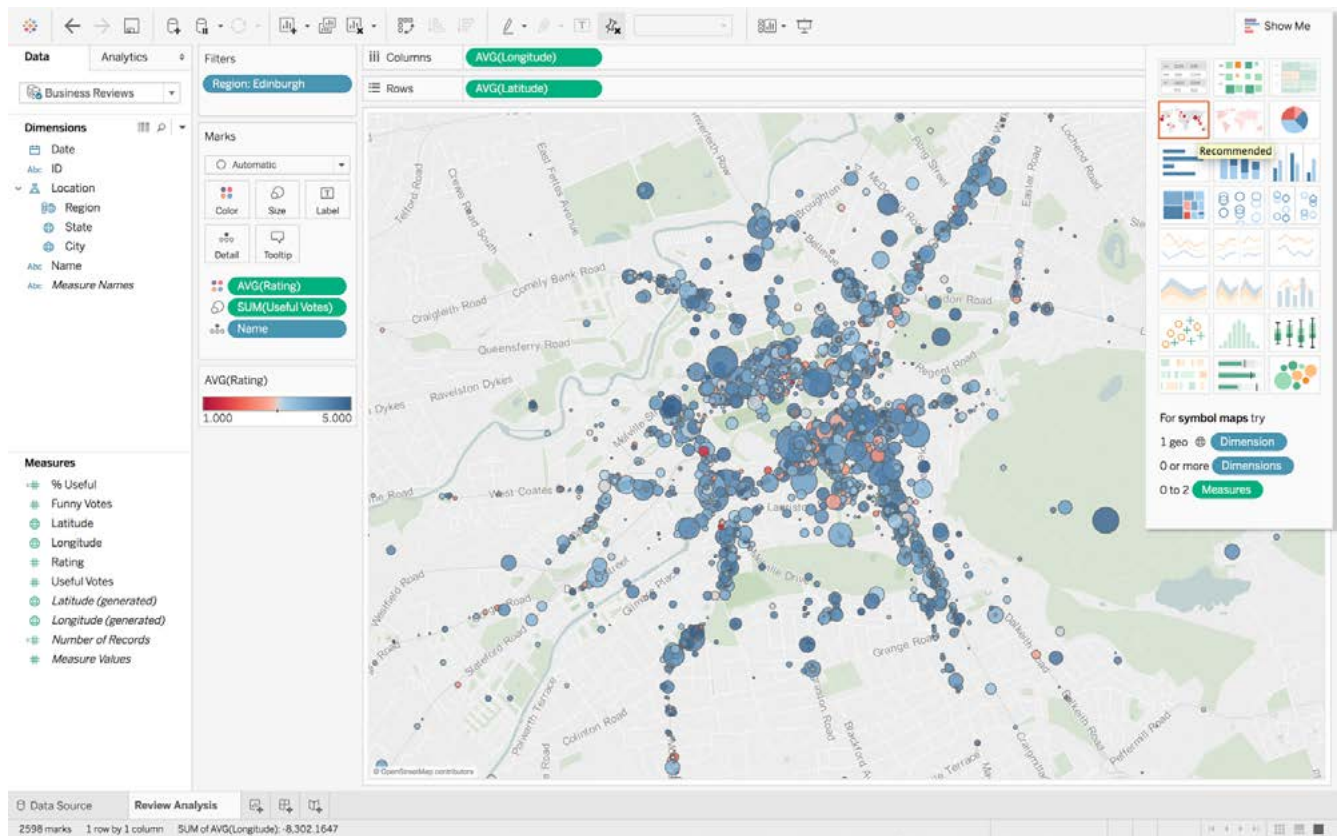


Figure 4: Drag-and-drop interactivity lets you instantly visualize fields from your data set—in this case, as a map.

## Analyze & Discover

- a. **Goal:** To analyze your data, and get answers to questions of varying complexity. To identify hidden opportunities from outliers and unforeseen trends.
- b. **Features and functionalities to look for:** Encoding by shape, color, size, and more, so you can explore data from different perspectives on the fly. Flexible calculation language with familiar formulas. Drag-and-drop analytics—from simple grouping to powerful integrations with scripting languages like R and Python.



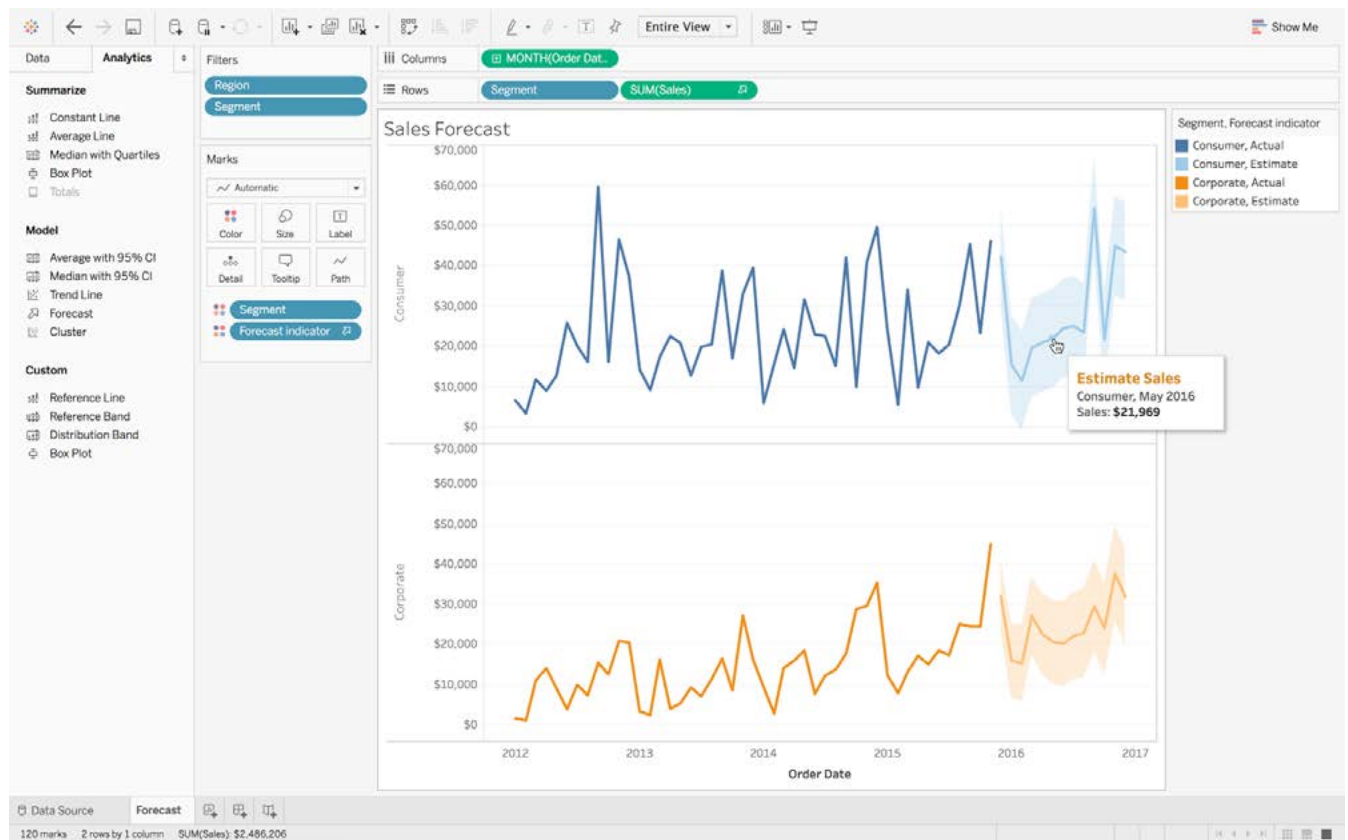


Figure 5: Built-in analytic techniques like forecasting help you analyze your data to identify areas of opportunity for your business.

## Share

- a. **Goal:** To share your visualizations and dashboards with others securely, so they can view, understand your insights, and explore the data for themselves.
- b. **Features and functionalities to look for:** Streamlined interface in the browser, with ways to categorize and search published visualizations and dashboards. Web authoring—the ability to edit published visualizations and dashboards online to answer new questions based on trusted data. Mobile application for iOS and Android to view and edit data and dashboards.

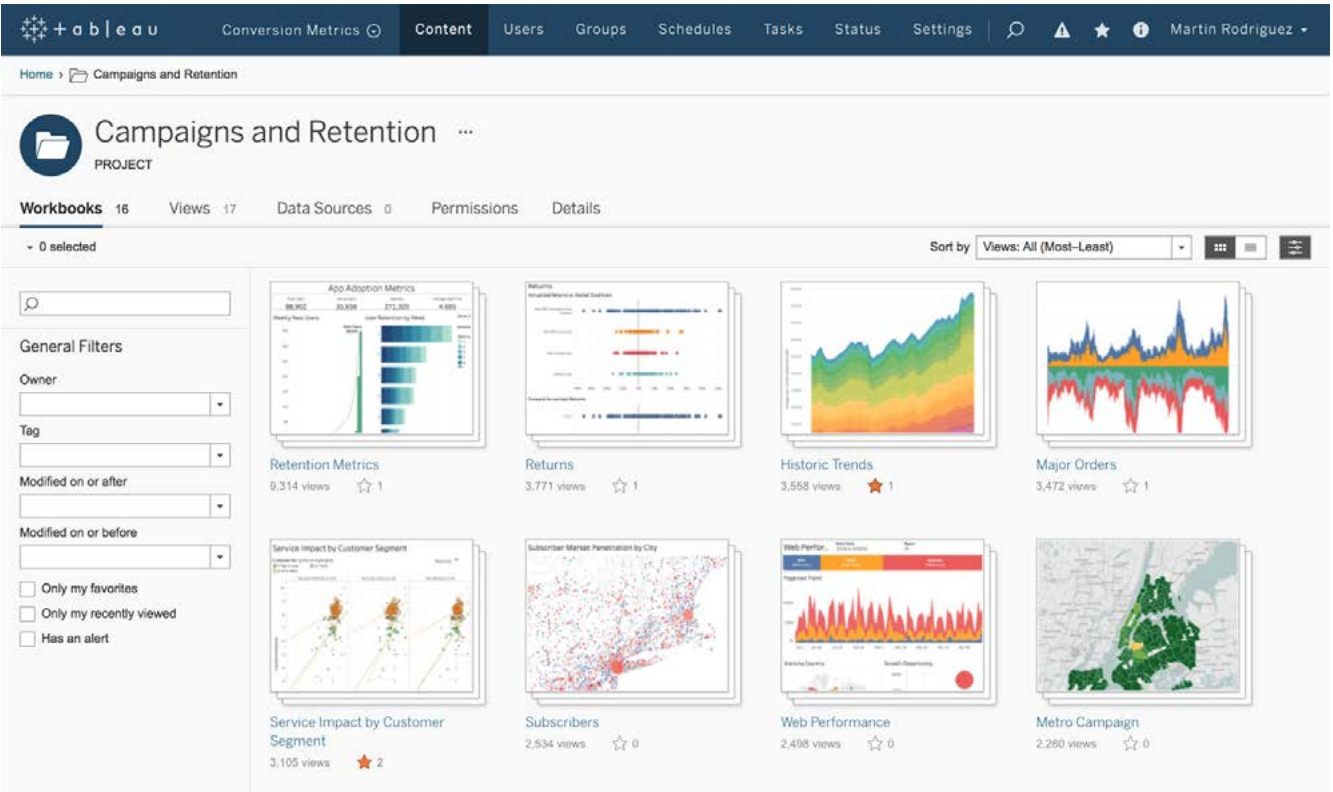


Figure 6: Online library of published visualizations and dashboards, so you can access data and dashboards from a browser or mobile device.

Promote & Govern

- a. **Goal:** To leverage the expertise of others in a centralized, governed location.
- b. **Features and functionalities to look for:** Deployment options—on-premises, in the public cloud, or hosted by your analytics provider. Permissions model for empowering the right people to access the data that matters. Integration into existing security models already applied to your data.

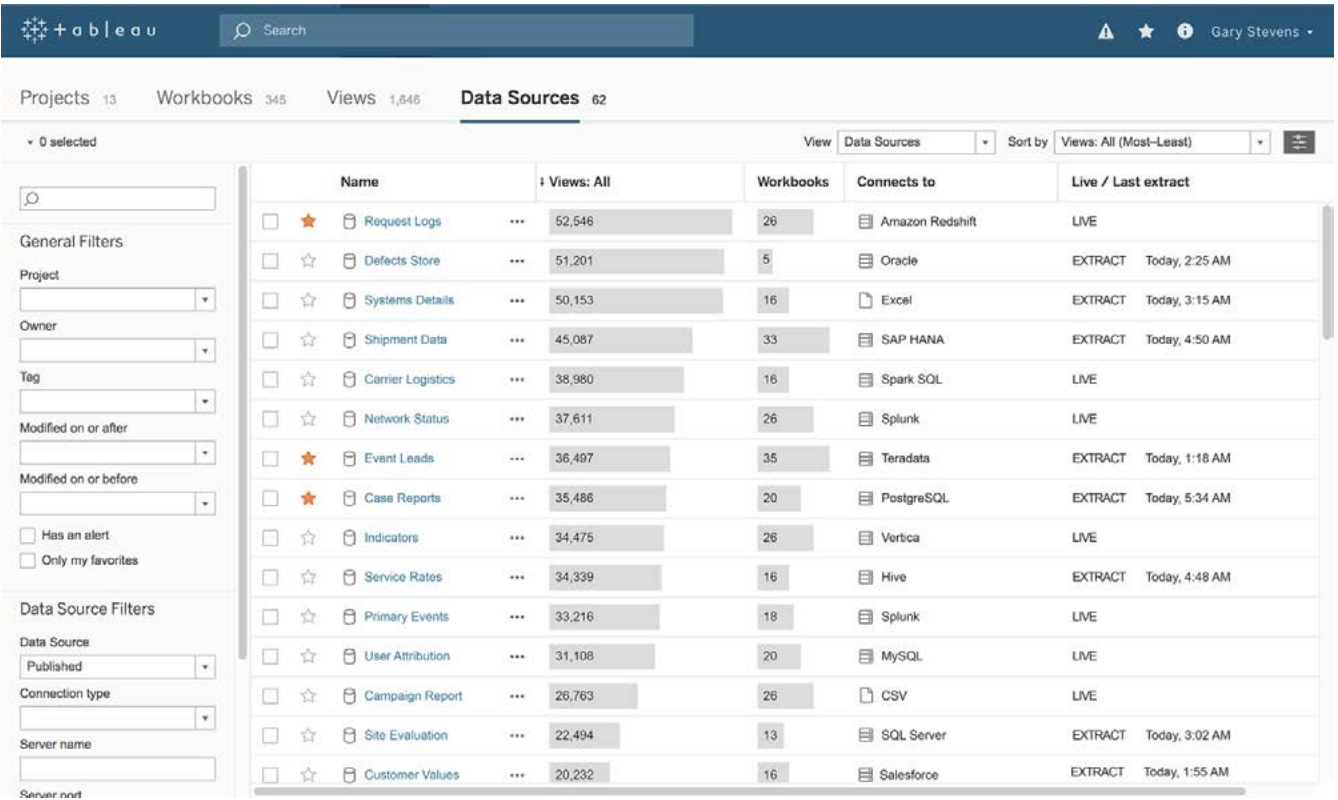


Figure 7: With permissions set, online administrative views give you visibility into which data sources are used the most, and how often they're refreshed.

Together, these stages inform and evolve your analytics, helping you answer questions, identify opportunities, and collaborate with people who know their areas of the business best. By choosing a visual analytics solution that allows you to move from one stage to the next freely—to experiment, improve, and challenge each other—you stop asking questions in a vacuum, and start getting results. The information you care about becomes accessible and meaningful with technology built for analytics.

*“Tableau allows us to rapidly iterate and do this rapid hypothesis testing to look for new things, and that’s important when you’re dealing with these really large data sets. You need to be able to change your views and the way you’re analyzing it pretty quickly. Tableau allows us to do that.”*

— BRIAN DURKIN,  
INNOVATION STRATEGIST,  
PROGRESSIVE INSURANCE

## Conclusion: Analytics for Innovation

While it’s important to stay on top of evolving market definitions, you have to remember the reason why we’ve united around analytics in the first place: More data is available to us every day; the decisions we make on behalf of our businesses are increasingly important; and we look to technology to help us organize and analyze that data. While the technologies that support us in this endeavor have changed over the years, our ultimate goal remains the same: to find answers to the questions that matter—the ones that identify opportunities to push our businesses in the right direction.

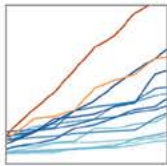
An [early paper on visual analytics](#) reads, “Let’s start with what visual analytics is not: A graphical depiction of data. Virtually any software application can produce a chart, gauge or dashboard. Visual analytics offers something much more profound. Visual analytics is the process of analytical reasoning facilitated by interactive visual interfaces.”

Our expectations for such a tool have evolved. We want something sophisticated and powerful, yet intuitive and easy to learn; available in a desktop application, but also online and on your mobile device; capable of advanced analytics, yet visual and engaging. Plus, it must facilitate each step in your cycle of analytics, to: connect to a wide range of data, prep that data for analysis, discover insights, share resulting visualizations and dashboards, iterate on trusted data, and manage all of these steps centrally, online.

We want to learn from each other so we can improve our own skills and make better decisions every day. An analytics application needs to encourage the resident genius to leverage models built in R and Python through smart integrations, while still providing core analytical functionalities to those unfamiliar with programming and coding—whose insights on data in their area of the business will inform better decisions for everybody.

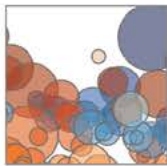
# About Tableau

Tableau helps extract meaning from information. It's an analytics platform that supports the cycle of analytics, offers visual feedback, and helps you answer questions, regardless of their evolving complexity. If you want to innovate with data, you want an application that encourages you to keep exploring—to ask new questions and change your perspective. If you're ready to make your data make an impact, [download a free trial of Tableau Desktop today](#).



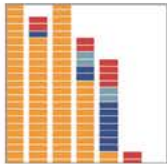
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