Why visual analytics?

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Why visual analytics?

Discover the unexpected; it's all about the journey. Sounds like the beginning of a travel brochure, right? Well, it fits because visual analytics helps you navigate a world full of data.

When you are trying to make sense out of your data, where do you begin? Two popular approaches to visual data analysis include data visualization and visual analytics. Each plays an important role in data exploration. You don't have to choose one or the other—they both help you to see and understand your data.

Data exploration usually starts with a question. But the answer to that question doesn't need to be the end of the journey.

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Asking "what" and "why"

A data visualization is a graphical depiction of data, such as dashboard or report. Data visualizations present views of data that answer "what," such as, "What are our sales and profits, for different regions, and different months or years?" They are good for answering a finite set of questions, and can be static or provide some level of interactivity for investigating those questions.

Being able to answer "what" questions in your data is incredibly valuable. It helps to tell a story about your data, and to identify problems and issues.
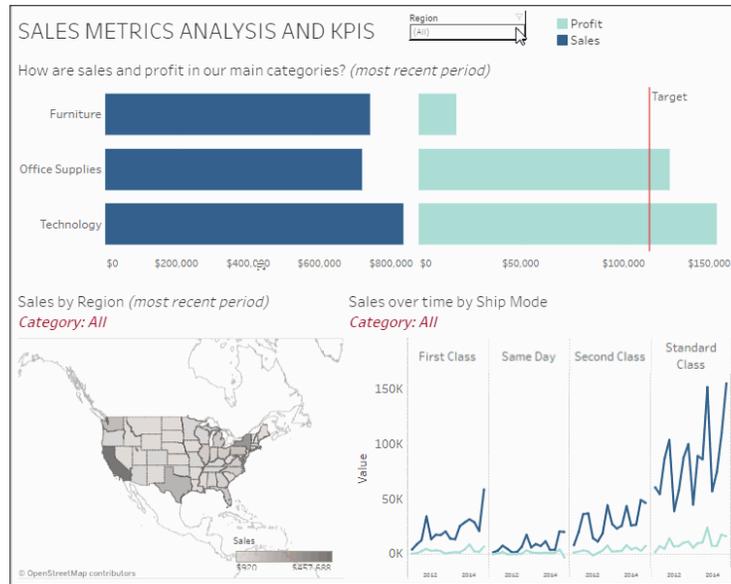
Figure 1: Interactive dashboard that shows sales and profits by region

For many people, creating dashboards and reports are the goal and final destination of their data exploration. But what if the data is revealing some type of issue, such as lower profits for a certain region or type of product?

To get to the root cause of an issue or problem, you need to be able to explore the dashboard's data directly, beyond the limits of a canned set of filters and categories. You might need to view the data with new types of visualizations, beyond the constraints of report templates and canned chart types, to answer your own questions.

The power of asking why

Answering "what" is the first step in exploring data. The next step is asking "why." To dig deeper, you need to be able to ask why and why again. When you need to learn more about what the data is telling you, you need visual analytics.

Visual analytics is a dynamic, iterative process where you quickly build different views to explore infinite paths of "whats," and the "whys" behind them. Visual analytics can help you explore, find answers, and build stories in your data. It even goes beyond those initial insights, so everyone who sees the visualization can ask questions and make unexpected discoveries.

An example of visual analytics in practice

The following example walks through a typical visual analytics workflow. Let's go back to the interactive sales report dashboard. It is a data visualization that answers a set of questions about sales and profits, for different regions.
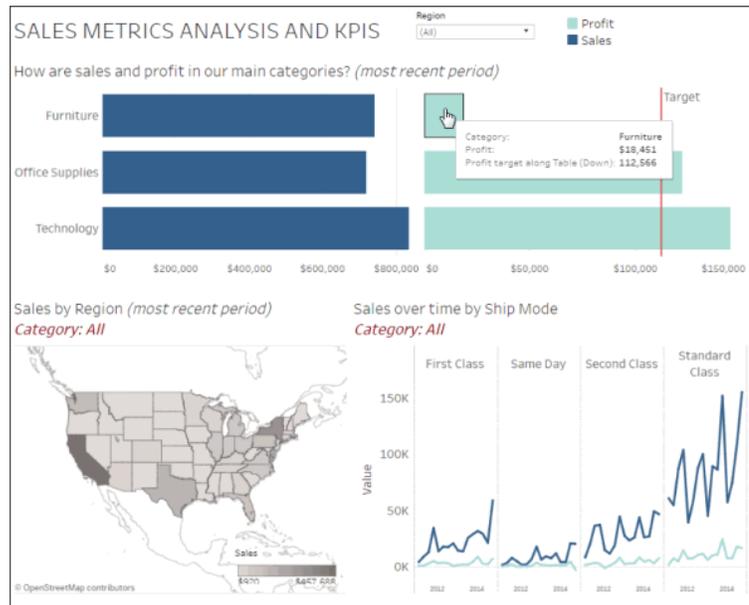

Figure 2: Dashboard with information about sales metrics analysis and KPIs

Furniture is not hitting the profit target, but looking at different regions isn't showing me why. To explore why, I want to create a new view that shows sales and profits for each type of product included in Furniture.
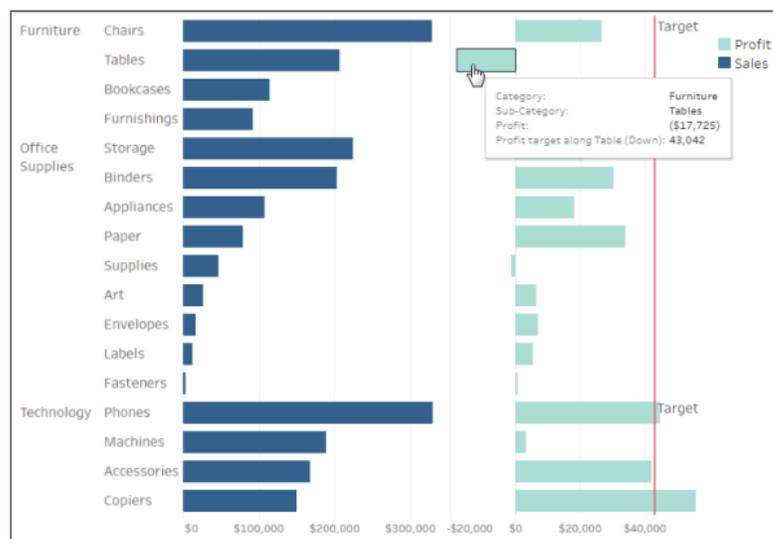

Figure 3: Dual bar chart shows selling tables results in loss of profit

Now I see that tables are not profitable. To answer why, I'll look at sales and profits for table manufacturers only.
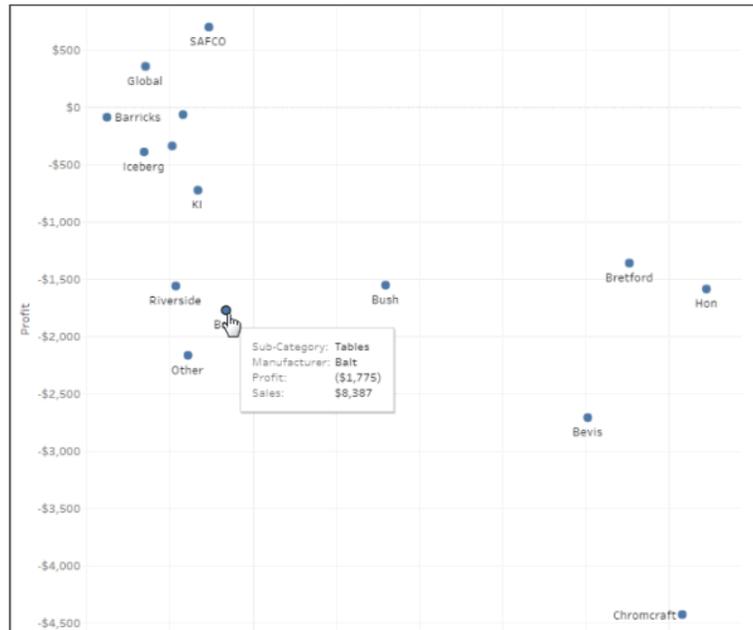

Figure 4: Scatterplot shows table profits by manufacturer

Why are so many different brands of tables losing money? We often apply discounts to tables. I'm going to change the view to see what level of discounts have been applied to every table sale order.

Figure 5: Table profit and discounts, encoded with color, by manufacturer

It looks like selling tables at a discount is creating lost profits. I've found the root cause of our issue.

Being able to ask why and quickly see the answer in my data revealed the underlying cause (discounting strategy) to the original problem (lack of profit in furniture).

Now what if I told you that I was able to create all of the views for that exploration in under 10 minutes? That is pretty fast. Think about the time a tool like this can save you in your daily work. That is the power of visual analytics.

Why visual analytics is effective

Visual analytics is a method for exploring data visually, in real-time. A productive visual analytics experience has certain characteristics. At any moment, you can:

• Instantly change what data you are looking at (with one click). This is important because different questions require different data.

• Instantly change the way you are looking at it (with one click). This is important because different views of data answer different questions.

With each incremental change, the view of the data updates immediately to help you intuitively explore different visualization types to find the right one. You can focus on exploring, instead of the mechanics of how to build a specific chart or being locked into a canned template. The meaning in your data unfolds as you create different views to answer different questions—so your exploration leads to better analysis, not dead ends.

Your questions and incremental changes don't touch the underlying data; they only change how the data is visually represented. Because the changes are made incrementally, it is always possible to undo, redo or return to a previous state. Every action is safe, because it can be instantly undone.

Best of all, the visual analytics process can lead to visualizations that show you the unexpected. Imagine how surprise findings can stimulate your thought process, and encourage deeper analysis or a different path of exploration.

Visual Analytics and data visualization compared

Capabilities	Data Visualization	Visual Analytics
Answers and shows "what."	■	■
Shows data points, problems, issues, or key indicators.	■	■
Presents a specific view of a data set. Gives you and users a snapshot of data to answer a specific set of questions.	■	■
A visual presentation of data, such as a dashboard or a report. Great device for communicating insights and telling stories about data.	■	■
Supports interactivity (filter dimensions, highlight values of interest, change view based on categories)	■	■
Supports deeper analysis and exploration for asking "why" questions.		■
Offers advanced analytics.		■
A journey through your data that doesn't require you to know what chart type or template you need, or where you are going.		■
Unifies the steps of querying, exploring and visualization data into a single process.		■
Fast, intuitive, freeform exploration of data that lets you quickly create many different views of your data.		■
Helps you think visually to explore problems, issues, and questions. Leads to unexpected insights and finding outliers in your data.		■
Helps you share key insights and collaborate with colleagues on the data.		■

What visual analytics can do for you

A high-quality visual analytics platform helps you to easily create impactful visualizations and dashboards, and encourages exploration to identify new opportunities for your business. The right solution supports data exploration, data visualization, and intuitive ad-hoc analysis.

When you need to, you can dive into and explore your data in an immediate, visual way, and follow your analysis at the speed of thought. After you hone in on the visualizations that are most useful for communicating your insights, you should be able to share those insights easily and securely.

Ask and answer your own questions, at the speed of thought

A visual analytics platform supports self-reliance; you shouldn't have to go through other people to ask the business questions that you need to ask. Being able to directly access to the data you need, and ask your own questions, makes you an incredibly valuable resource to your organization. It frees up another curious, smart mind (yours) to be able to identify issues and suggest solutions.

You can forage freely in the data you are interested in, identifying outliers and reaching meaningful insights much faster. Visual analytics supports self-directed, open-ended data exploration that lets you follow your thoughts visually down different paths. Your exploration can include recognized chart types, but should not be constrained by them. When you are constrained by a specific analysis path that is locked into a specific structure (a chart type, or a template, or a wizard), your analysis and paths for exploration become limited.

Visual analytics gives you immediate answers because the structure for your analysis is created anew, instantly, every time you ask a new question. And you should be able to analyze data in an ad-hoc way, from different databases and spreadsheets at the same time, in the same view.

A visual analytics workspace should be easy and intuitive to learn, but also support advanced analytics when needed.

Your visual analytics workspace should automatically suggest visual best practices, so you can create the best visualization to communicate your insights effectively. Your data questions should drive the structure of the visualization, not the other way around (form follows the data)—but you shouldn't have to memorize every chart type and know when to use which one. In other words, the right visual analytics platform will help you determine how to apply color, shape, text, and overall layout so your data tells the story you want it to.

Data and visualization should work in tandem. The steps of querying, exploring and visualizing data should come together in a single process. Good visual analytics allows for fast exploration, iteration, prototyping and sketching with data to support the way you think.

It needs to cater to your question-and-answer process, no matter how complicated it becomes: Visual analytics software should support your analysis. When you need to predict sales in the future, for instance, your software should allow for predictive forecasting; when you want to understand a trend, drag and drop trend lines should be available.

Helps you make an impact in your organization

When you are able to create meaningful, insightful visualizations on a consistent basis, you increase your visibility and contribution in your organization. No matter where you sit or what your title is, you can provide key information that contributes to making better business decisions.

In most organizations, unshared discoveries are useless. You should be able to share your insights and collaborate on results, on-premise or in the cloud. Every time you discover something new in your data, you should be able to share your "hey, look at this" moments. Sharing your findings leads to your colleagues discovering their own insights. It helps all of you put more brain power towards getting better answers and finding better solutions.

About Tableau

Tableau helps people transform data into actionable insights that make an impact. Easily connect to data stored anywhere, in any format. Quickly perform ad hoc analyses that reveal hidden opportunities. Drag and drop to create interactive dashboards with advanced visual analytics. Then share across your organization and empower teammates to explore their perspective on data. From global enterprises to early-stage startups and small businesses, people everywhere use Tableau's analytics platform to see and understand their data.

Next steps

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