Rapid Graphs with Tableau Software

Create Intuitive, Actionable Insights in Just 15 Days

Stephen McDaniel
Co-founder and Principal Analyst
Freakalytics™, LLC
Rapid Analytics to Explore, Understand, Communicate and Act™
http://www.Freakalytics.com/RapidGraphs

Editor: Eileen McDaniel, Ph.D.
Co-founder and Marketing Analytics Consultant
Freakalytics™, LLC

Reviewer: Marc Rueter
Director of Sales Consulting
Tableau Software

Cover Design: Cristy Miller
Senior Visual Designer
Tableau Software™
Cover Graphs by Stephen McDaniel
Photo by Loic Nicolas, San Francisco, CA
About Freakalytics and the author

Freakalytics, LLC was founded by Stephen McDaniel and Eileen McDaniel, Ph.D. Our mission is to cultivate a passion for analytics in our public training, custom training and consulting engagements. Our courses are designed around the principles of rapid analytics. Following these principles will help you explore your data, understand and interpret the data, communicate your findings and take action!

Co-founder Stephen McDaniel has 20 years of experience as a teacher, consultant, leader, innovator and author in the fields of business intelligence, data warehousing and data mining. As co-founder of Freakalytics, LLC and author of “Rapid Graphs with Tableau Software” and “SAS for Dummies”, Stephen is dedicated to helping people understand, present and take action with their data.

Stephen has worked with or been an invited instructor at many leading organizations:

- Netflix
- UC- Berkeley
- Tableau Software
- EBay
- State Farm
- Eli Lilly
- SAS
- The US Department of State
- Best Buy
- American Express
- Yahoo!
- Duke University
- The US Department of the Treasury
- Amgen
- Fidelity Investments
- Target
- Glaxo SmithKline
- Microsoft
- IMS Health
- Oracle
- Pfizer
- Boeing
- Loudcloud
- Brio Software

Our worldwide public training schedule is available at http://www.Freakalytics.com/training and our custom training and consulting information is available at http://www.Freakalytics.com/consulting. You can contact us at Info@Freakalytics.com or by phone at (206) 588-1678.
# Table of Contents

## Chapter 1  
Tableau Software – rapid graphs to explore, understand, communicate and act!  
- Power .................................................. 2  
- Speed .................................................. 4  
- Flexibility .............................................. 6  
- Simplicity .............................................. 7  
- Beauty ............................................... 8

## Chapter 2  
Build the core: Tableau basics  
- Download, install and open Tableau ........................................ 9  
- Connect to sample data and review the Tableau interface ........ 10  
- Show Me Tableau in action! ............................................. 12  
- Categorically clear views ............................................. 15  
-  .................................................. 20

## Chapter 3  
Go with the flow: more Tableau basics  
- When tables trump graphs ............................................. 25  
- Insightful maps ............................................. 26  
- View shifting- the underrated histogram and flexible bins .... 29  
- Exporting results to share your insights .............................. 34  
-  .................................................. 39

## Chapter 4  
Creating and managing Views to explore and inform  
- Text Tables- an eye for detail ........................................... 41  
  1. Text Table ............................................. 43  
  2. Highlight Table ......................................... 44  
- Heat Maps- how intense is it? ......................................... 45  
- Bar Charts- five flavors to meet your needs ....................... 46  
  1. Aligned Bar ........................................... 46  
  2. Stacked Bar ........................................... 48  
  3. Side-by-Side Bar ........................................ 49  
  4. Bar with Measure on Color ..................................... 50  
  5. Histogram ............................................. 51
Chapter 5

Creating and managing advanced Views

Line Charts - describe what happened recently
1. Line (Discrete)  
2. Line (Continuous)

Scatter Plots - relationships matter
1. Circle  
2. Scatter (Single)  
3. Scatter (Matrix)  
4. Dual Axis

Gantt Chart - understand the details over time

Pie Charts - by popular demand

Geographic Maps - where did it happen?

Chapter 6

View structure, visual appearance, Summaries, Formatting and Titles

Customizing Views from Columns, Rows, Pages and Filters Shelves
1. Columns  
2. Rows  
3. Pages  
4. Filters

Enhance visual appeal with the Marks card
1. Text  
2. Color  
3. Size  
4. Shape  
5. Level of Detail

The Summary Card - rapid data insights

Headers and Axes

Titles, Captions, Field Labels and Legends

Formatting values in your Views
Chapter 7 Organizing Views- Sorting, Filtering, Quick Calculations, Spotlighting and View Trending _ 89

Simple and advanced Sorting of Views _______________________________ 90
Simple and advanced Filtering of Views ____________________________ 93
Aggregations for measures- specify the right summaries ______________ 95
Percentages provide balance to compare ratios ______________________ 96
Quick Table Calculations ____________________________________ 97
Spotlighting your View to call out important values ________________ 98
Totals and Subtotals to sum up parts of your view _________________ 100
Model your data with Trend Lines _________________________________ 102

Chapter 8 Managing data is critical - Data Items and data management in Tableau _______ 107

Data items: names, types, roles, properties, and attributes __________ 108
View Underlying Data- understand the detail behind the View _________ 119
Dividing numeric data items into intervals using Bins _______________ 120
Grouping dimensions into categories ______________________________ 122
The power of Sets to combine and filter your View _________________ 124

Chapter 9 Advanced data management in Tableau __________________________ 127

Calculated Fields- power to answer your difficult questions __________ 128
Queries to retrieve the data you need ______________________________ 138
Extracts to accelerate your data exploration in Tableau ______________ 140

Chapter 10 Sharing your insights from Tableau ____________________________ 143

Exporting Images to other applications ____________________________ 144
Exporting Data to other applications and even back to Tableau _______ 146
Publish as PDF- export your views to Adobe Acrobat format _________ 149
Packaged Workbooks- take Tableau on the road! _________________ 150
Tableau Reader- share with your colleagues, friends and family _______ 151
Tableau Server- powerful insights for everyone! _________________ 152

Appendix - Timesaving Tips _____________________________________ 153
Chapter 1

Tableau Software – rapid graphs to explore, understand, communicate and act!

**Power, speed, flexibility, simplicity and beauty**

These words come to mind when I reflect on Tableau Software. A picture is indeed worth a thousand words, so I will provide many examples to demonstrate why I am so enthusiastic about Tableau. Before diving into the examples, I would like to explain why I decided to write the first book on Tableau.

While there have been many applications over the past two decades that have attempted to simplify data exploration and analysis for a broad audience, only a handful achieved mild success. To be frank, most failed to deliver on this goal. I have personally used many of these products during my career. In fact, I have led software development and product strategy for some of these predecessor products. Unfortunately, many of the designs were based on the underlying technology, hindered by legacy systems, reliant on advanced analytic methods or designed around the technical database architecture. This ultimately led to overly complex products that excluded the vast majority of potential users and were cumbersome even for expert users. Even worse, many of these products actually impeded the ability of experts to easily share and explain findings with the broader audience.

Surprisingly, few applications have focused on how the typical person perceives images and thinks about information. **Tableau has addressed this head-on and changed the landscape forever.** Rooted in sound principles for clear information presentation and good graph design, you can use Tableau to rapidly explore, analyze and understand your data with easy to understand graphs and tables! Based on my experience, Tableau can help anyone who analyzes data in business, government or research to markedly increase their productivity. Even more impressive, people with limited exposure to data analysis can learn and use Tableau to improve their daily decision-making in a relatively short amount of time.

**Power, speed, flexibility, simplicity and beauty**

This chapter will provide you with explanations and examples around each of these strengths. After reading this chapter, I hope you are inspired to take action and learn how to use this exciting application!
Rapid Graphs with Tableau Software

**Power**

Whether you are exploring your data for new insights, answering specific questions or even deciding what questions to ask, Tableau gives you unprecedented control to investigate, communicate and take action with the information that is hiding in your data! Offering a broad palette of options to graph your data, intuitive means follow your thoughts by rapidly changing your view, powerful functionality to adjust your data metrics for relevant questions and many other capabilities to enable focusing on the relevant data - Tableau has it all. With Tableau, you can work with every major data source- from Excel workbooks to the largest databases. Tableau even enables extracting data from larger sources into a local “extract” file that will accelerate your data exploration and allow offline analysis when you are away from the office!

**Profit versus planned profit of major product lines by region (red is below plan and green is above plan)**

![Graph showing profit comparison](image)

**Exploring average time to ship products (size of bubble) by priority (color of bubble) and region against total sales and average profit**

![Graph showing ship time analysis](image)
Exploring the relationship of sales and profit across every order

Easily map your data - US government social insurance payout per person (color of square) and payout per person as a percent of amount paid into system (size of square) by state in 2006
Rapid Graphs with Tableau Software

**Speed**

Faster than you thought possible, you can build presentation quality graphs and tables in Tableau. You can have total control over creating the view or you can ask Tableau to generate the view based on the data that you select. From the view, you can rapidly sort, filter and group the displayed data- with just a few clicks of your mouse. **Each example demonstrates rapid changes made with Tableau in just a few seconds!**

**Gross profit data by Zip code – from bar chart to map with one click!**

Highlight a data point to examine the underlying data behind that value
Create Intuitive, Actionable Insights in Just 15 Days

Four views are better than one: From detailed table to color-highlighted table to side-by-side bar chart to color-encoded bar chart in under 30 seconds!
Rapid Graphs with Tableau Software

**Flexibility**

You can easily change any part of your view to look exactly how you want, ranging from data point shapes and colors to clear data labels to intuitive color palettes to the way your metrics are calculated and compared. The days of thinking of your graphs as “good enough” are a relic of the past with Tableau!

Create a new grouping of data by interacting with the view in just a few clicks

Color code elements of the view for effective communication to your audience
Create Intuitive, Actionable Insights in Just 15 Days

Simplicity

Getting started in Tableau is easy. In the first few weeks, you can learn the basics and begin mastering the techniques of graphical data exploration. Soon you will discover a rich set of powerful functionality to enable rapid completion of more complex visualizations. Those questions that you always wanted to investigate but thought were impossible can be explored with Tableau!

My experience with many other applications is that a typical application requires 2-4 weeks of steady use to learn and remember how to complete several moderately complex tasks. Achieving strong proficiency in many applications often requires months or even years. However, if you work with this book and Tableau steadily over 15 Days, I think you can easily achieve strong proficiency in the first few weeks. At that point, there is still an exciting journey of learning many techniques of graphical data exploration, understanding, and communication. At this point, the possibilities are nearly unlimited, as you will discover that Tableau is extremely intuitive and built to “stay out of your way”, so you can focus on your data more than on how to use the tools!

Areas of simplicity

- Direct interaction with graphs and data items to drag and drop what you want to see
- Sort the data automatically or manually directly from the view
- Simple and complex grouping of data categories from the view
- Easily exclude irrelevant data or include only the items of interest from the view
- Wide variety of automated calculations such as change over prior year or year over year growth without complex formulas
- Powerful array of advanced calculations for almost any need
- Quickly add subtotals and totals
- Readily explore the data underlying part of the view with one click
- Shift from other views to maps of the data with one click
- Easily export your work to other applications such as PowerPoint and Word
- Free Tableau Reader allows interactive functionality for those outside your team
- Publish your work to the web for wide consumption of results in your company; no installation of any kind is required for web users to have a rich subset of the desktop application functionality

www.Freakalytics.com
Create your own works of art while telling the story of your data in Tableau! Combining powerful insights with beautiful views all in one package will keep your audience engaged and informed during presentations. Tableau allows you to explore and understand the hidden value and patterns in your data. Tableau also encourages active use of good design principles, making it easy to impress others with effective, clear communications that lead to lively discussions and actionable results. The live dashboard below is available at http://www.Freakalytics.com/p/4.

Tracking Economic Indicators and Stock Market Returns from 1901-2008; Relationships of Past, Present, and Future Values by Year

Select a range of years (Click+drag), a decade, or specific years (<CTRL>-Click) to highlight data below.

Select market metric to update bar chart:
Real past 12 months return

Real past 12 months S&P Comp return with dividend (selected above)

Select values from any of the above distribution plots. Selected years show as blue and deselected as gray. You can Click+drag to select a continuous area or <CTRL>-Click to select multiple specific values. Values from only one metric can be selected at a time to highlight all of the other graphs. Deselect by clicking on the graph whitespace.