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 _____ *1*

Tableau Software – rapid graphs to explore, understand, communicate and act! _____ **1**

Power _____ 2
Speed _____ 4
Flexibility _____ 6
Simplicity _____ 7
Beauty _____ 8

Chapter 2 _____ *9*

Build the core: Tableau basics _____ **9**

Download, install and open Tableau _____ 10
Connect to sample data and review the Tableau interface _____ 12
Show Me Tableau in action! _____ 15
Categorically clear views _____ 20

Chapter 3 _____ *25*

Go with the flow: more Tableau basics _____ **25**

When tables trump graphs _____ 26
Insightful maps _____ 29
View shifting- the underrated histogram and flexible bins _____ 34
Exporting results to share your insights _____ 39

Chapter 4 _____ *41*

Creating and managing Views to explore and inform _____ **41**

Text Tables- an eye for detail _____ 43
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 _____ *53*

Creating and managing advanced Views _____ **53**

Line Charts- describe what happened recently _____ 55

1. Line (Discrete) _____ 55
2. Line (Continuous) _____ 56

Scatter Plots- relationships matter _____ 57

1. Circle _____ 57
2. Scatter (Single) _____ 58
3. Scatter (Matrix) _____ 59
4. Dual Axis _____ 62

Gantt Chart- understand the details over time _____ 64

Pie Charts- by popular demand _____ 65

Geographic Maps- where did it happen? _____ 67

Chapter 6 _____ *69*

View structure, visual appearance, Summaries, Formatting and Titles _____ **69**

Customizing Views from Columns, Rows, Pages and Filters Shelves _____ 70

1. Columns _____ 70
2. Rows _____ 71
3. Pages _____ 72
4. Filters _____ 73

Enhance visual appeal with the Marks card _____ 74

1. Text _____ 75
2. Color _____ 75
3. Size _____ 75
4. Shape _____ 75
5. Level of Detail _____ 75

The Summary Card- rapid data insights _____ 81

Headers and Axes _____ 82

Titles, Captions, Field Labels and Legends _____ 85

Formatting values in your Views _____ 86

Chapter 7 _____ *89*

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 yourVview_____100
Model your data with Trend Lines _____102

Chapter 8 _____ *107*

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 _____ *127*

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 _____ *143*

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.

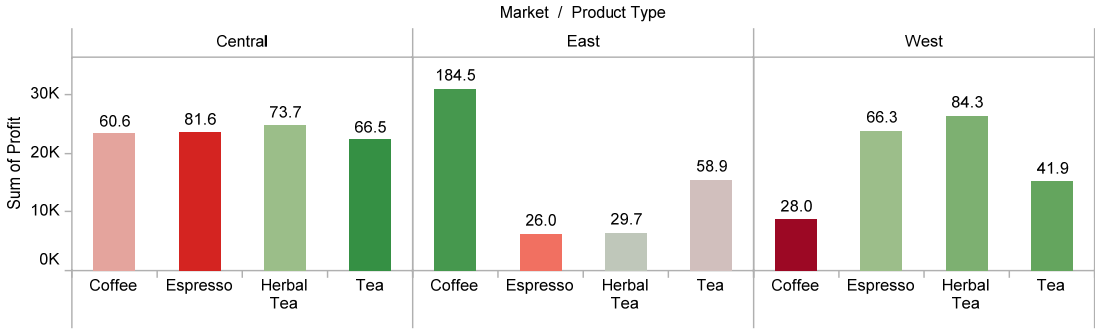
Power, speed, flexibility, simplicity and beauty

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!

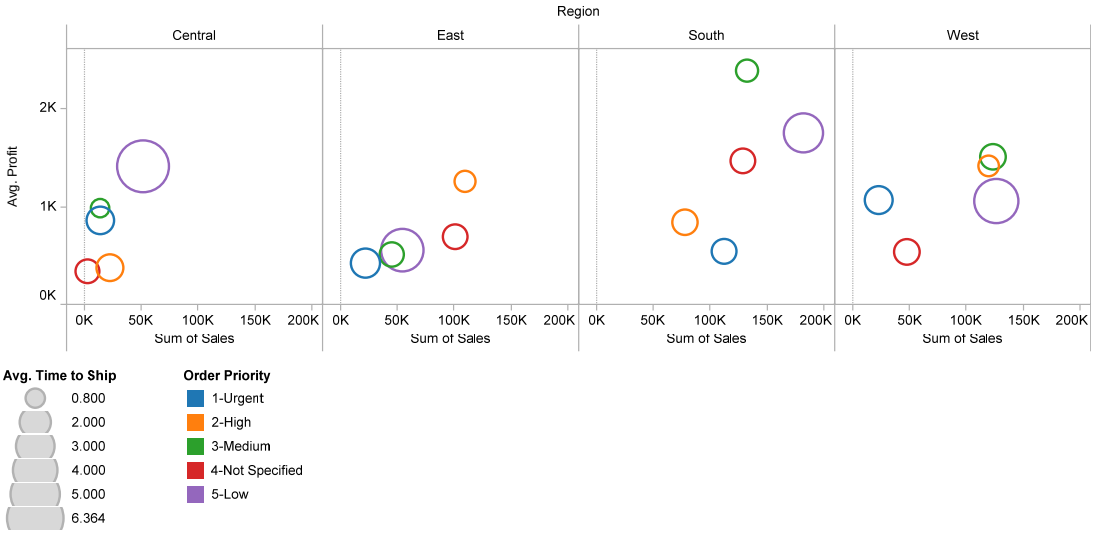
Power

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)

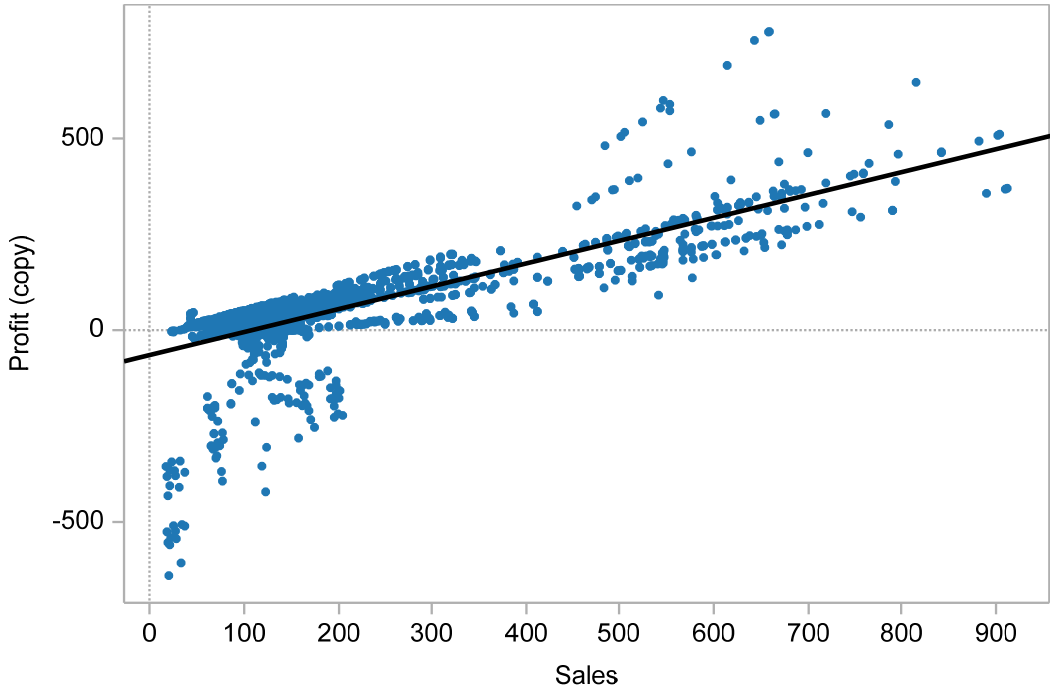


Exploring average time to ship products (size of bubble) by priority (color of bubble) and region against total sales and average profit

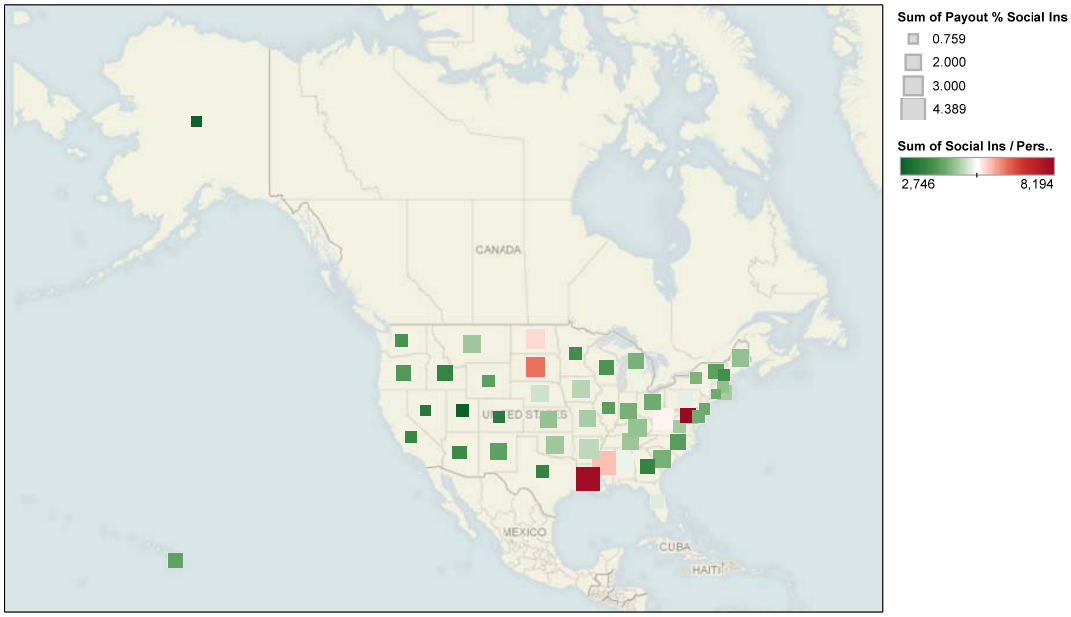


Copyright © 2009 Freakalytics, LLC

Exploring the relationship of sales and profit across every order



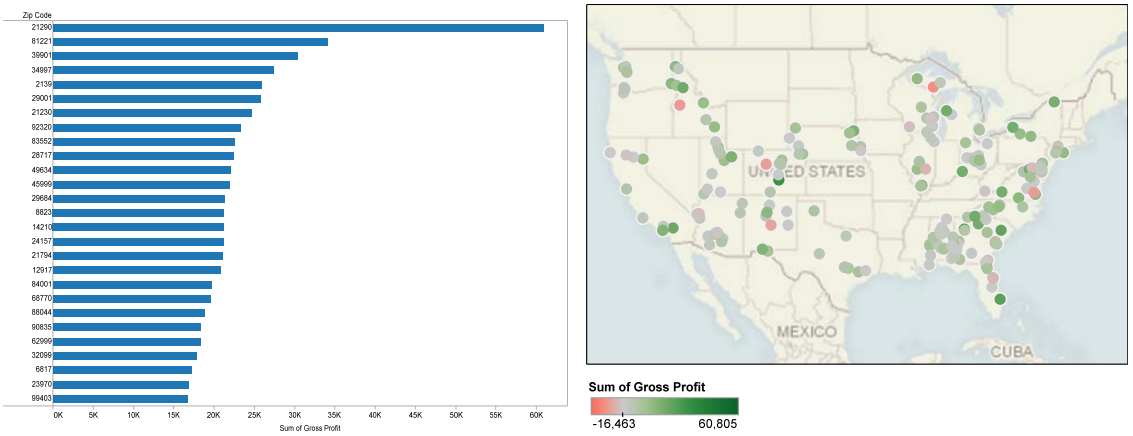
Easily map your data- US government social insurance payout per person (color of square) and payout per person as a percent of amount paid into system (size of square) by state in 2006



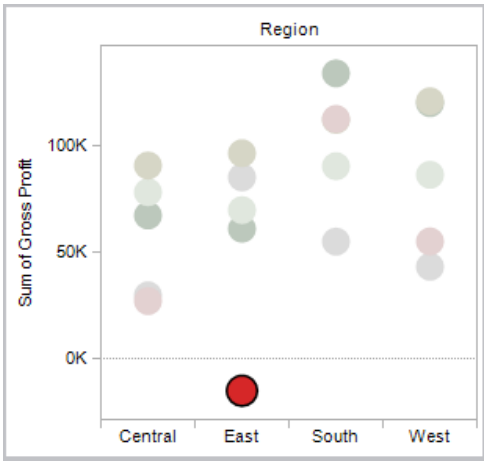
Speed

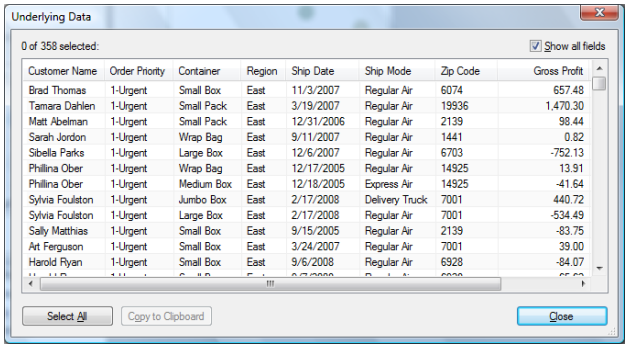
Faster than you thought possible, you can build presentation quality graphs and tables in Tableau. You can have total control over creating the view or you can ask Tableau to generate the view based on the data that you select. From the view, you can rapidly sort, filter and group the displayed data- 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





Copyright © 2009 Freakalytics, LLC

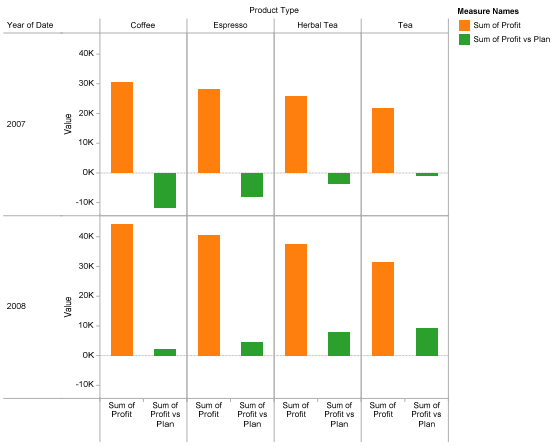
Four views are better than one: From detailed table to color-highlighted table to side-by-side bar chart to color-encoded bar chart in under 30 seconds!

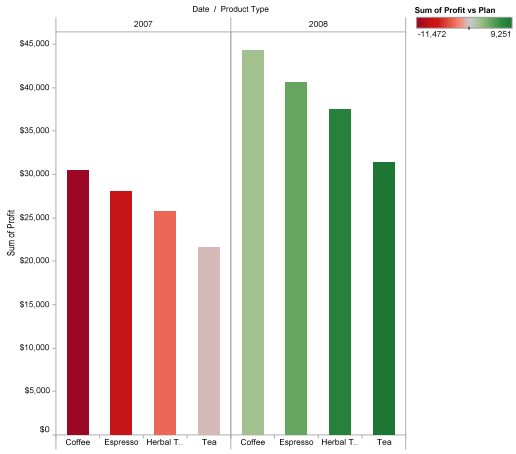
		Date												
		Sum of Profit								Sum of Profit vs Plan				
		2007				2008				2007				
Market	Product	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Central	Columbian	843	928	915	793	1,271	1,311	1,287	1,177	-237	-252	-255	-267	191
	Lemon	582	719	677	574	879	1,016	952	854	-198	-181	-193	-176	99
	Decaf Espre..	950	945	874	840	1,432	1,337	1,235	1,246	-430	-365	-406	-790	52
	Darjeeling	1,050	1,155	1,220	970	1,583	1,630	1,722	1,439	20	35	70	80	553
	Chamomile	1,433	1,430	1,515	1,501	2,162	2,023	2,143	2,228	-137	-130	-105	-39	592
	Earl Grey	991	1,075	1,073	1,070	1,495	1,520	1,518	1,592	81	55	63	180	585
	Caffe Mocha	1,419	1,512	1,607	1,431	2,138	2,140	2,271	2,124	-511	-528	-583	-1,069	208
	Decaf Irish C..	908	1,045	1,089	889	1,370	1,476	1,536	1,322	-222	-275	-251	-291	240
	Mint	399	430	456	375	601	608	643	557	-21	-40	-34	-25	181
	Amaretto	457	500	556	567	689	705	788	842	-163	-110	-134	-163	69
	Green Tea	77	87	130	205	117	122	184	305	-13	-3	-10	-5	27
East	Columbian	2,461	2,940	3,298	2,430	3,714	4,150	4,656	3,607	-89	-110	-142	20	1,164
	Lemon	580	945	885	823	874	1,337	1,238	1,220	-40	45	55	193	254
	Decaf Espre..	240	248	257	237	363	351	363	352	-70	-92	-53	-113	53
	Darjeeling	645	676	710	618	973	957	1,002	919	-195	-184	-210	-182	133

	Date							
	2007				2008			
Product Type	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Coffee	72%	74%	74%	70%	109%	104%	105%	104%
Espresso	79%	80%	79%	73%	119%	113%	112%	109%
Herbal Tea	85%	88%	87%	91%	128%	125%	122%	136%
Tea	95%	97%	96%	103%	143%	137%	136%	153%

Profit as a % of Plan

70% 153%

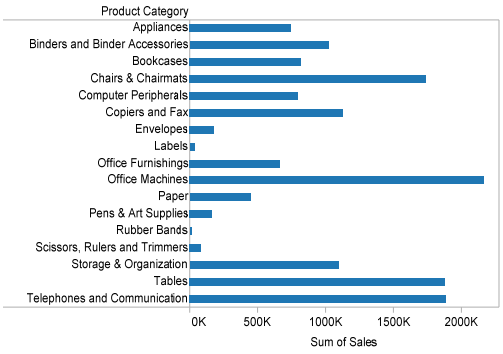


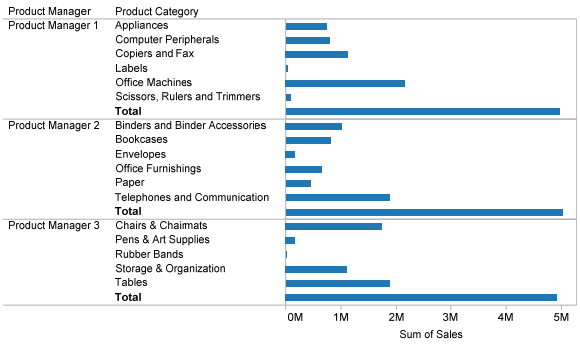


Flexibility

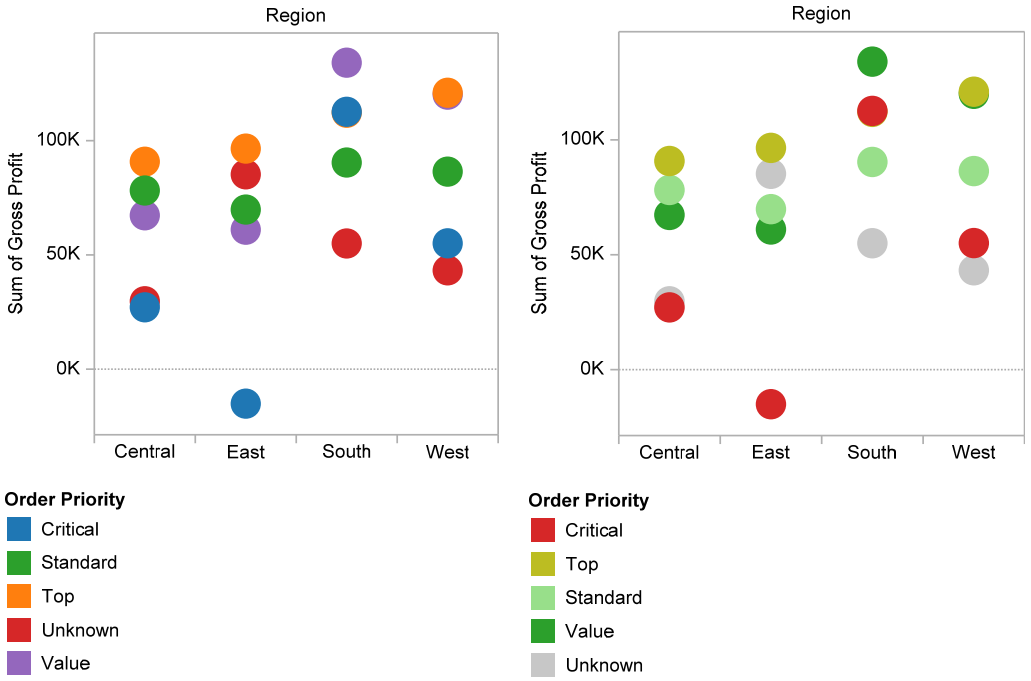
You can easily change any part of your view to look exactly how you want, ranging from data point shapes and colors to clear data labels to intuitive color palettes to the way your metrics are calculated and compared. The days of thinking of your graphs as "good enough" are a relic of the past with Tableau!

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



Copyright © 2009 Freakalytics, LLC

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!

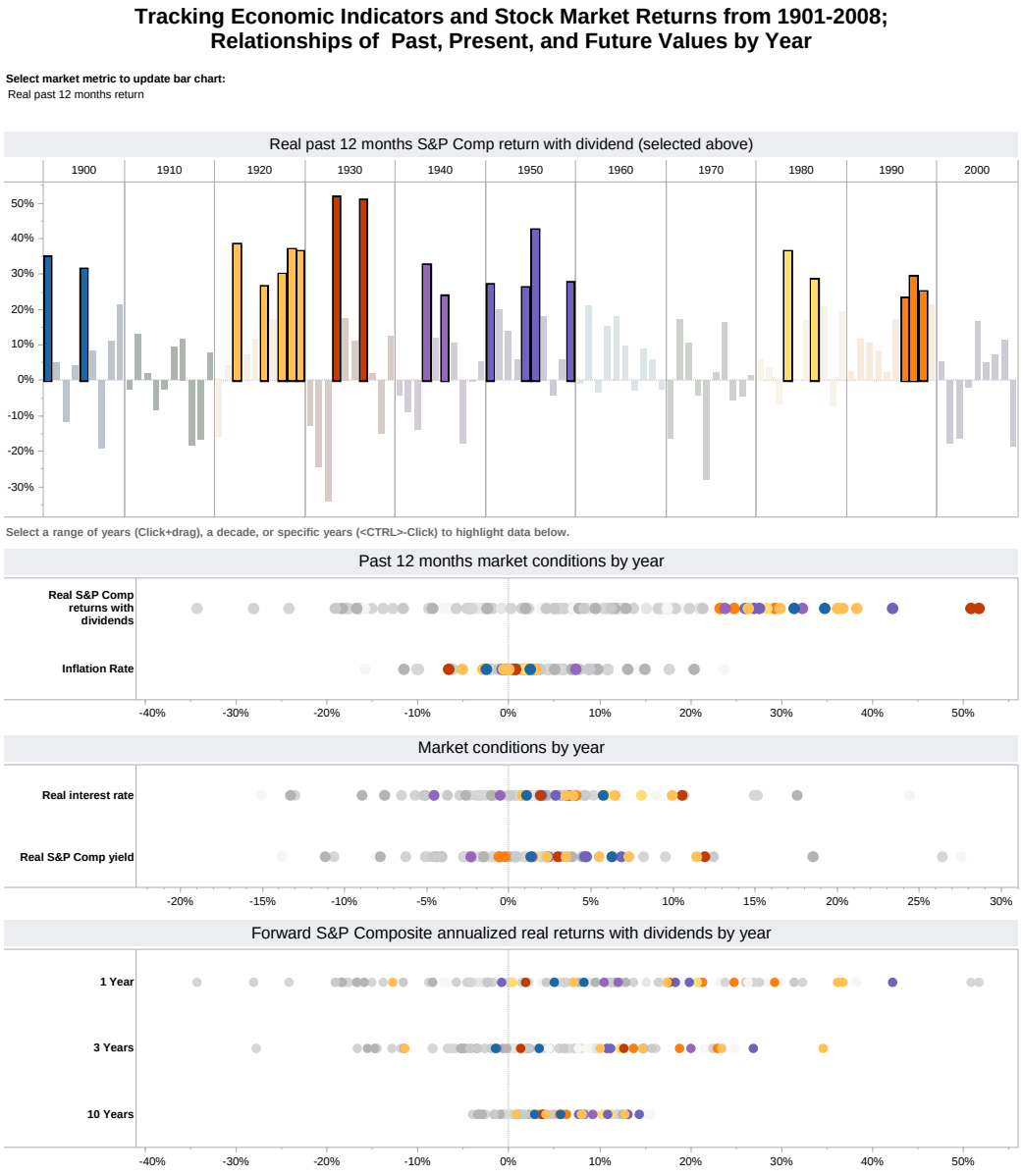
My experience with many other applications is that a typical application requires 2-4 weeks of steady use to learn and remember how to complete several moderately complex tasks. Achieving strong proficiency in many applications often requires months or even years. However, if you work with this book 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**

Beauty

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.



Copyright © 2009 Freakalytics, LLC