Purpose Driven Design in QlikView and Qlik Sense

About

me

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this presentation

All slides and examples posted on:
https://github.com/skokenes/Purpose-Driven-Design-in-Qlik

why design is important

Design increases the value of our content

Not enough to just provide access to data

Guide for discovery

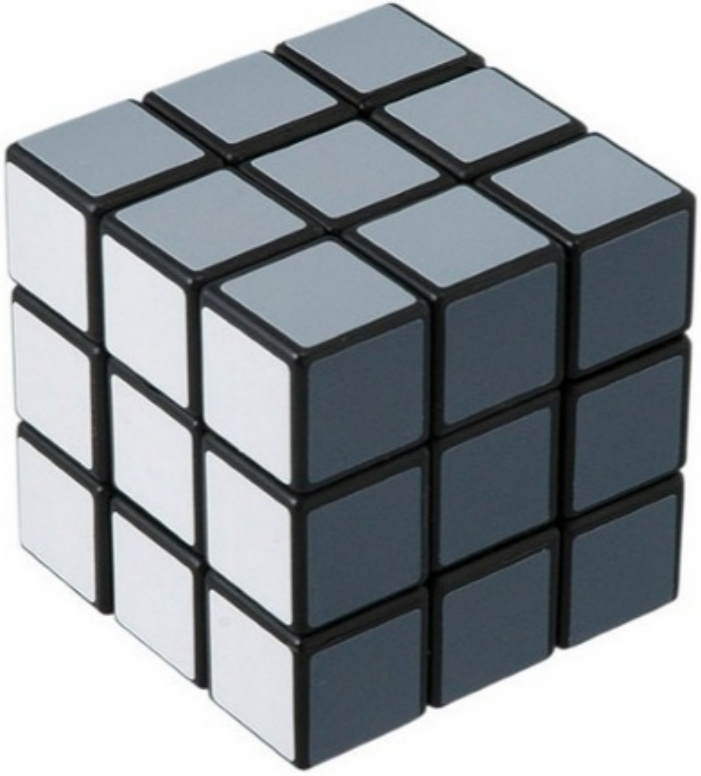
How is the data consumed?

What questions can it answer?

purpose driven design

making design decisions in support of a goal

meaningful data display



vs.

natural analytics

Use design elements to play on the natural strengths of people to perceive, interpret, and analyze information

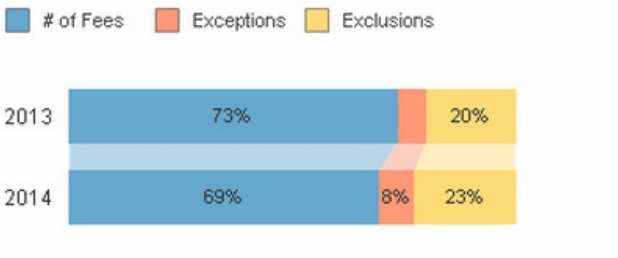
QlikView 11 Example - Business Background

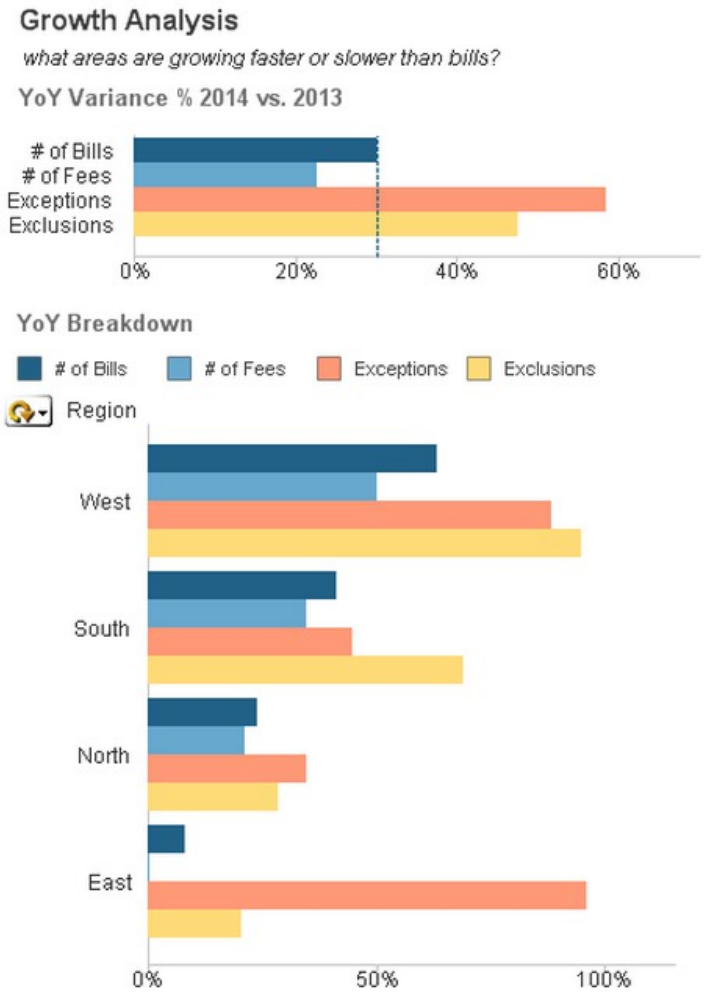
- utilities company
- **Bills** customers for their service
- **Fees** are incurred on top of usage bills
  - fees may be waived for two reasons:
    1) **Exceptions:** someone manually waived the fee for the customer
    2) **Exclusions:** fees are automatically waived for legal or contractual reasons

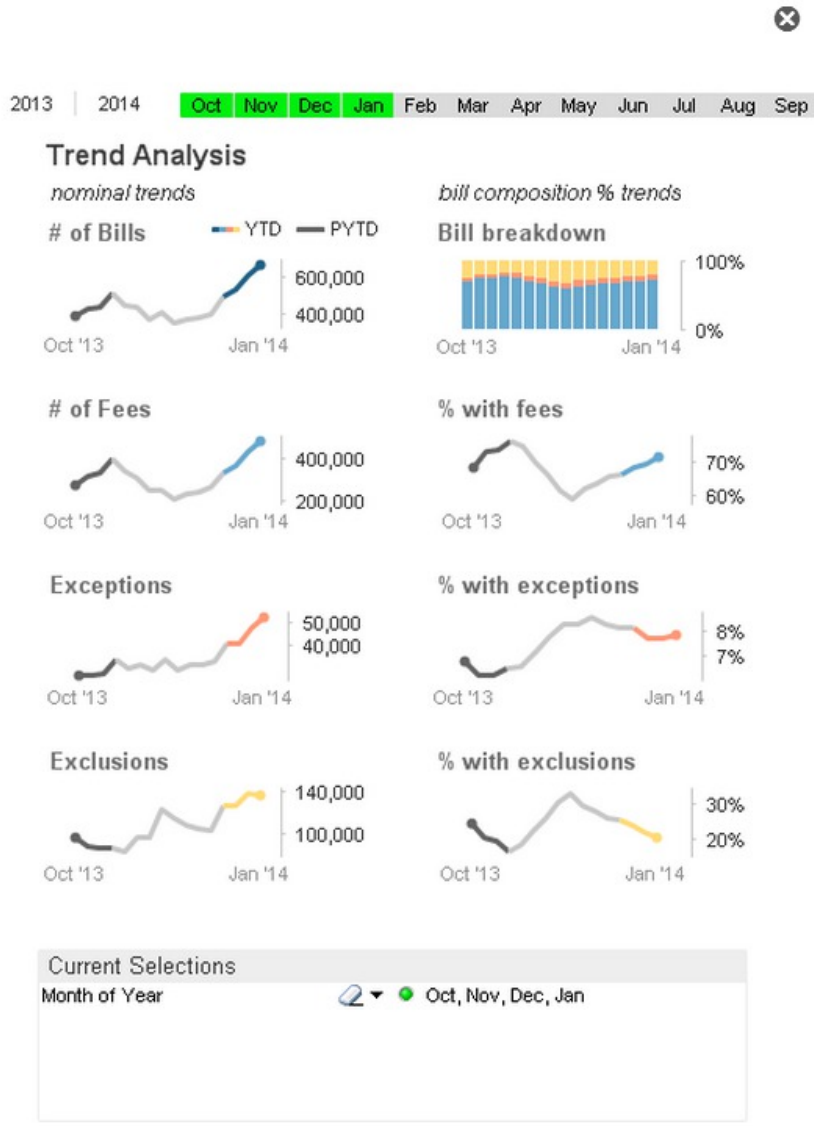
QlikView 11 Example - Business Problem

- Bills were up higher than ever
- Fees weren't as high as expected
- The organization is used to reporting on nominals. Everything was up nominally, including fees, so they had little insight into the fees issue and its causes


Bill Analysis
year over year nominal analysis
# of Bills
YoY Var %
2013 1,773,013
2014 2,305,692
+30%
# of Fees
YoY Var %
2013 1,302,666
2014 1,599,219
+23%
# of Exceptions
YoY Var %
2013 114,307
2014 181,085
+58%
# of Exclusions
YoY Var %
2013 356,040
2014 525,387
+48%


Composition Analysis
what % of bills are collecting fees?
# of Fees
Exceptions
Exclusions
2013 73% 20%
2014 69% 8% 23%


Growth Analysis
what areas are growing faster or slower than bills?
YoY Variance % 2014 vs. 2013
# of Bills
# of Fees
Exceptions
Exclusions
0%
20%
40%
60%
YoY Breakdown
# of Bills
# of Fees
Exceptions
Exclusions
Region
West
South
North
East
0%
50%
100%


2013
2014
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Trend Analysis
nominal trends
bill composition % trends
# of Bills
YTD
PYTD
600,000
400,000
Oct '13
Jan '14
Bill breakdown
100%
0%
Oct '13
Jan '14
# of Fees
400,000
200,000
Oct '13
Jan '14
% with fees
70%
60%
Oct '13
Jan '14
Exceptions
50,000
40,000
Oct '13
Jan '14
% with exceptions
8%
7%
Oct '13
Jan '14
Exclusions
140,000
100,000
Oct '13
Jan '14
% with exclusions
30%
20%
Oct '13
Jan '14
Current Selections
Month of Year
Oct, Nov, Dec, Jan

Layout - the Gradual Reveal

People scan information from left to right and top to bottom

A dashboard can be organized this way to answer a series of questions in a natural flow

Gradually reveal more data to the user

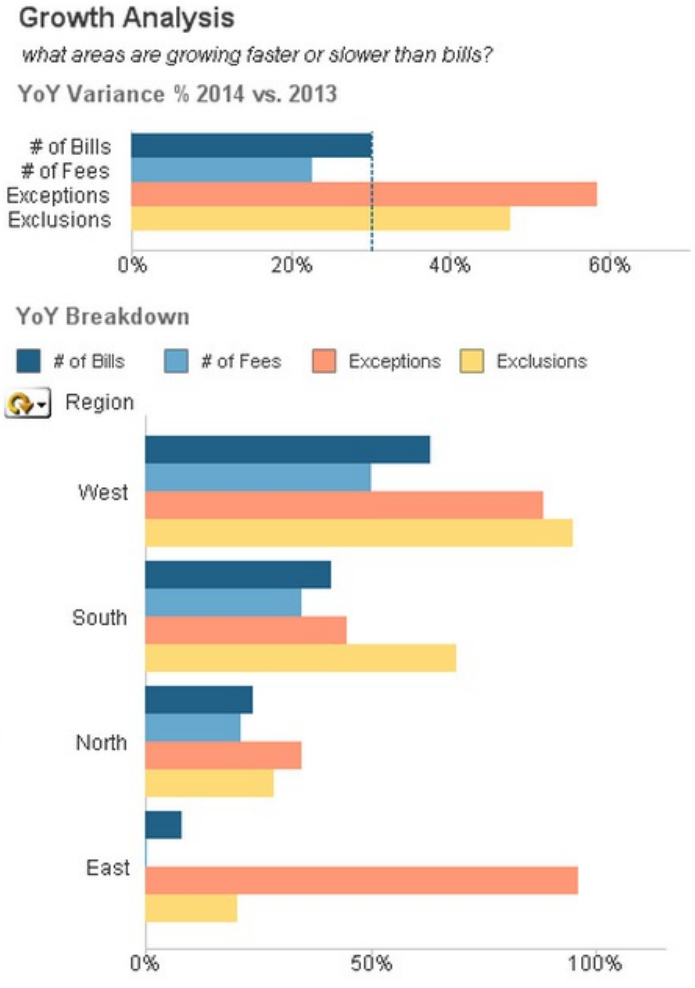
A typical gradual reveal flow

1) high level summary - what is happening across the data?

2) breakdown of summary - what parts of the data are driving the summary numbers?

3) granular details - what actionable items exist at the lowest level of the data

Example Gradual Reveal



Process vs. Priority

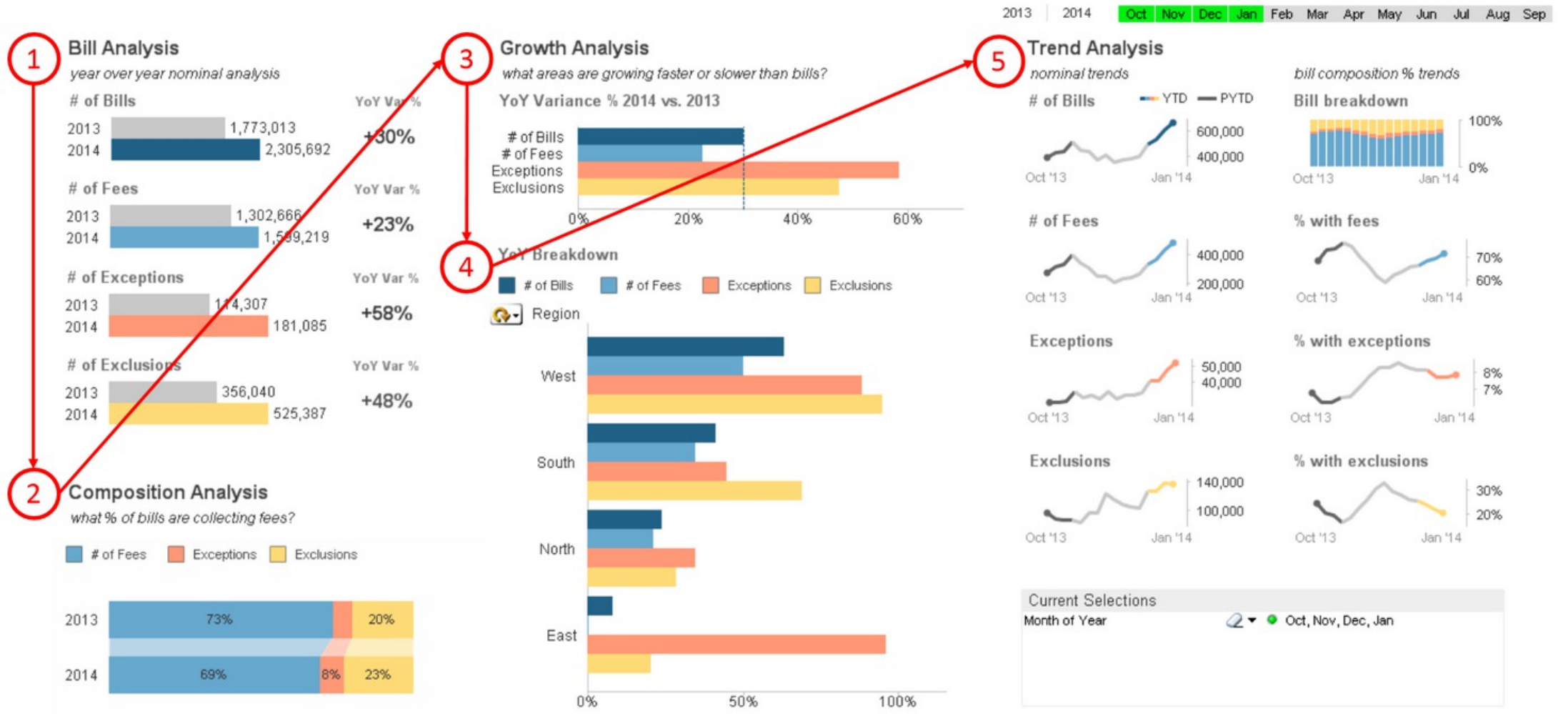
The gradual reveal layout is process oriented, not priority oriented.

The YoY Growth Analysis section is arguably the most important part of the dashboard because it identifies the problem and where it is coming from.

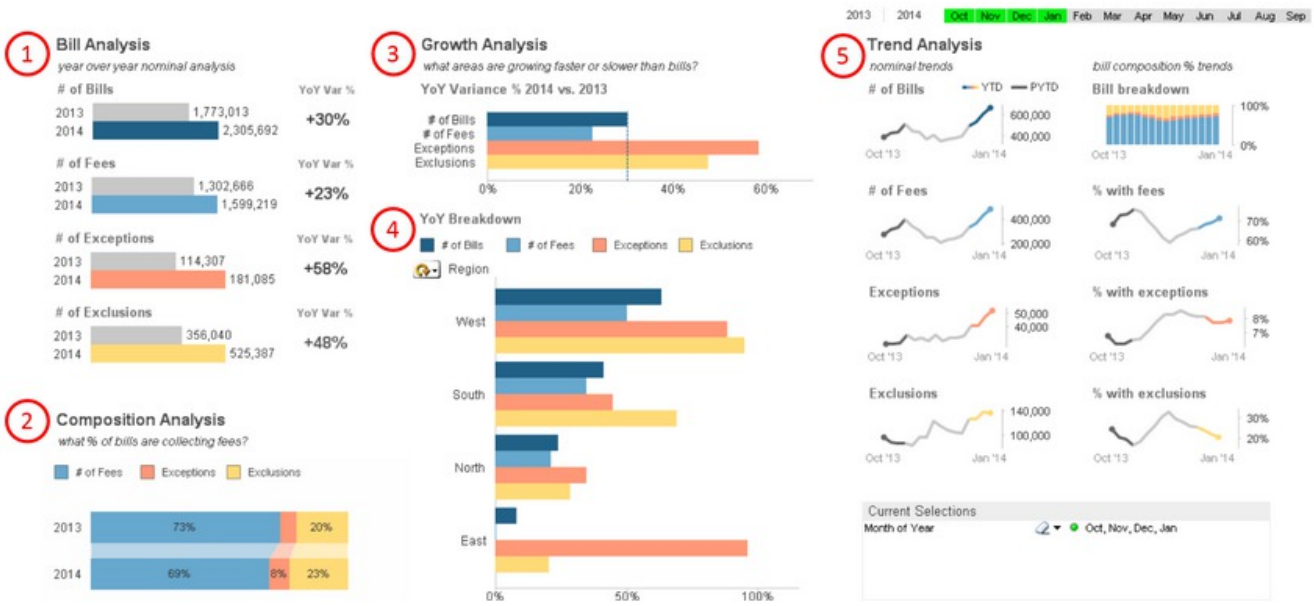
However, YoY % Growth is an unfamiliar metric to this company and confuses users at first glance.

The dashboard is laid out to guide them towards this new type of analysis.

Fee Dashboard Layout



Fee Dashboard Layout Breakdown



1. **What happened?** Expressed in nominals, which is familiar territory for the users. Then, derives the YoY % Growth to the right of the nominals. This teaches the YoY % concept to the users.

2. **How do the metrics compare to each other?** This section gets the user thinking about how the metrics interact and influence each other and normalizes them by removing the influence of the total growth in bills.

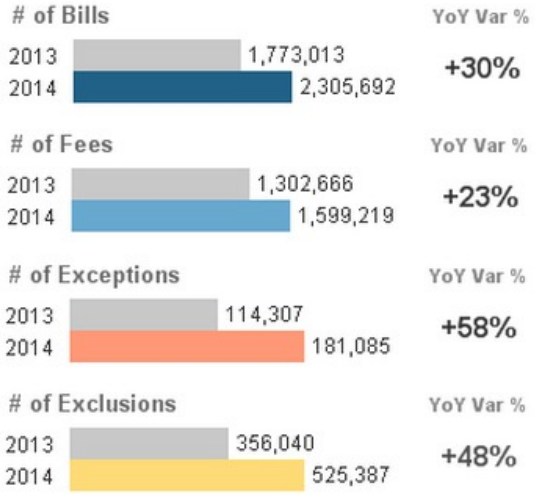
3. **What is the problem?** Now that the users understand YoY% and how the metric relate regardless of total bill growth, the dashboard shows them how exceptions and exclusions have grown faster than the number of bills has grown, which leaves fees lagging.

4. **What is driving the problem?** The same chart can now be repeated but broken down by different dimensions so that users can interactively find the problem areas. For example, the East and West regions have seen extreme growth in Exceptions.

5. **When did this problem start?** These trend charts, while not offering explicit details, provide quick insight into when the problem started.

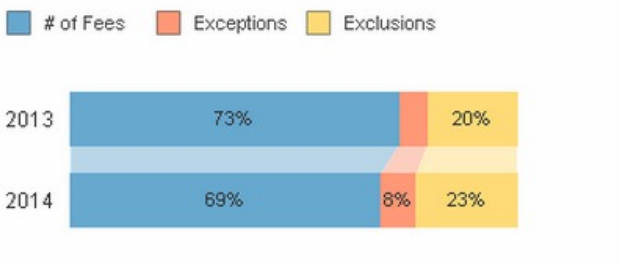
Bill Analysis

year over year nominal analysis



Composition Analysis

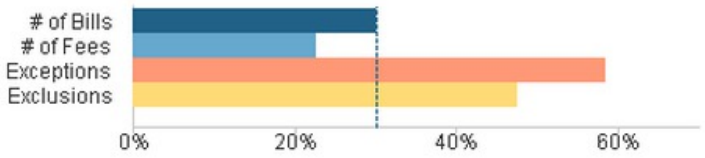
what % of bills are collecting fees?



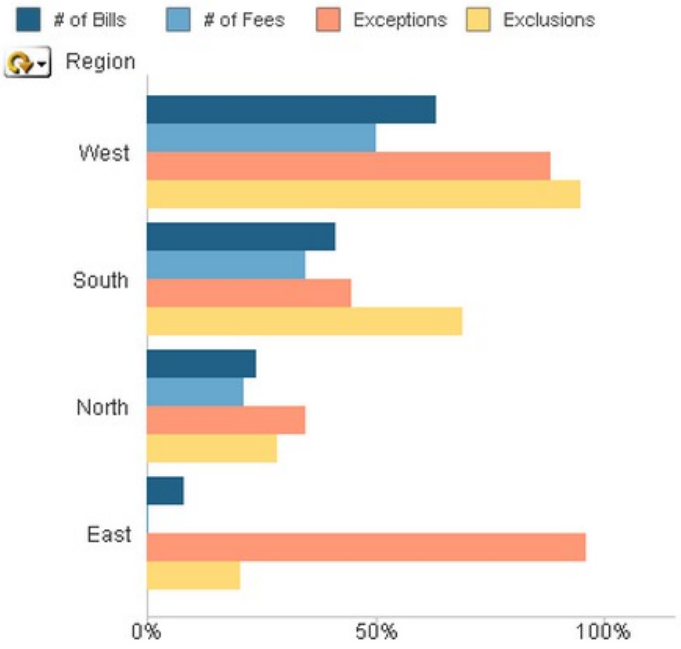
Growth Analysis

what areas are growing faster or slower than bills?

YoY Variance % 2014 vs. 2013

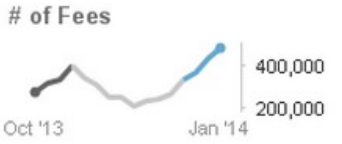


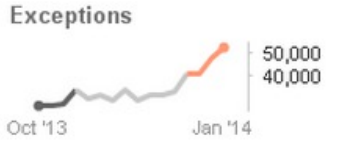
YoY Breakdown

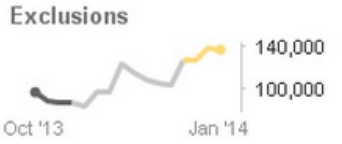


Trend Analysis

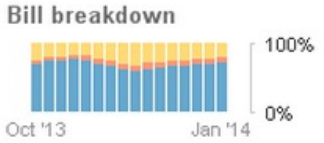
nominal trends

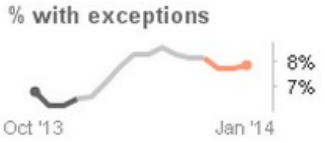


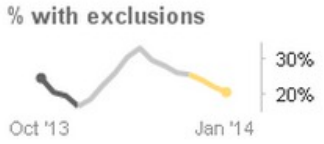


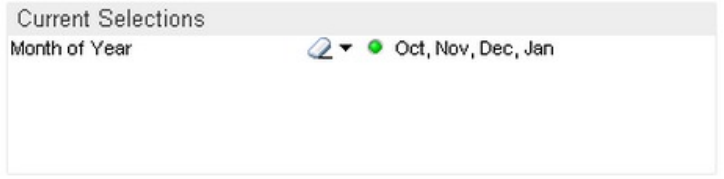


bill composition % trends





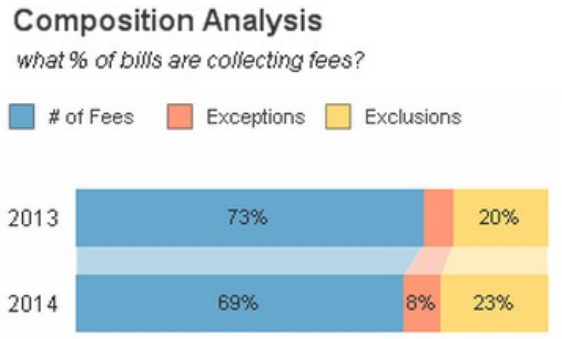




Minor details with big impact

small details and annotations can go a long way in increasing the usability and impact of a visualization

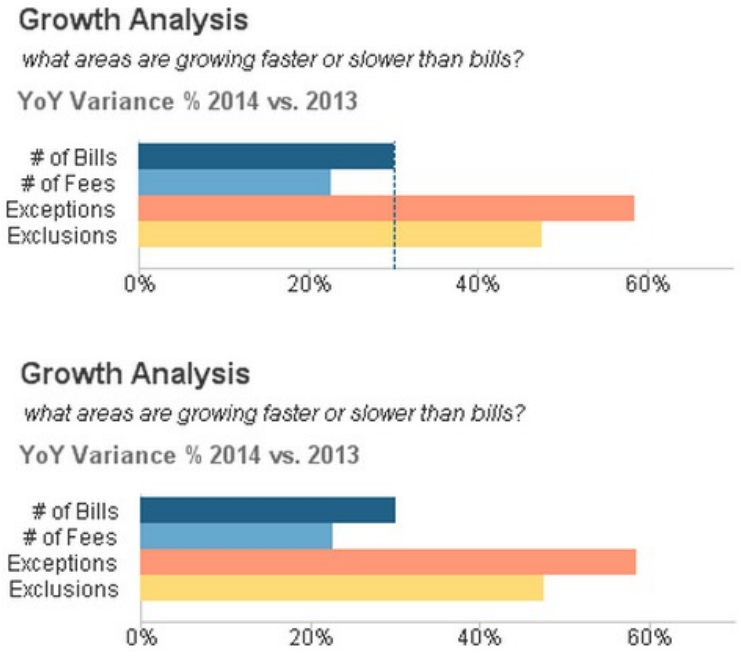
Example detail: composition chart transition



A subtle transitional area between the bars reinforces that the chart is illustrating a change over time

The transition area also results in polygons shaped similar to funnels, making it clearer whether the components grew bigger or smaller

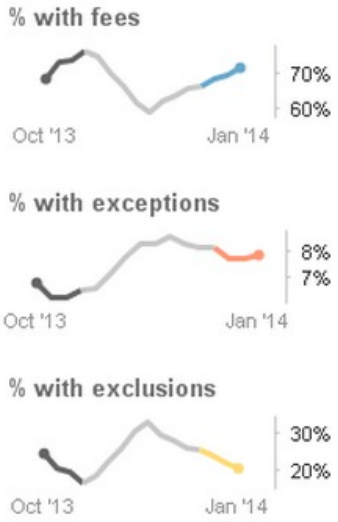
Example detail: growth analysis reference line



The reference line on the Growth Analysis chart communicates the purpose of the chart: comparing the growth of fees, exceptions, and exclusions to the growth of total bills.

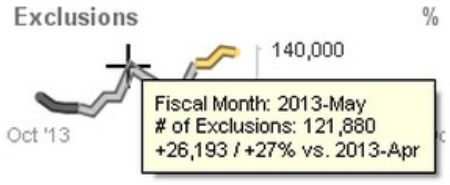
Without the reference line, it not immediately clear what analysis should be done.

Example detail: sparklines with color encoding



The sparklines use color to encode the current YTD period vs. the prior YTD period. This enables users to quickly compare the same period of a year without the need for extensive labeling of the x-axis.

Example detail: details on demand



Details on demand is the concept of providing extra levels of a detail based on interaction from a user. In the sparklines, a user can hover over the points to find out information about specific months. In this example, May 2013 was identified as a point of interest from the dashboard.

Design in Sense - Extensibility

Qlik Sense's new APIs allow developers to extend Qlik's capabilities in powerful ways.

This extensibily includes designing custom visualizations and UI/UX with more advanced functionality and levels of detail.

Edward Tufte and the Google Map Test

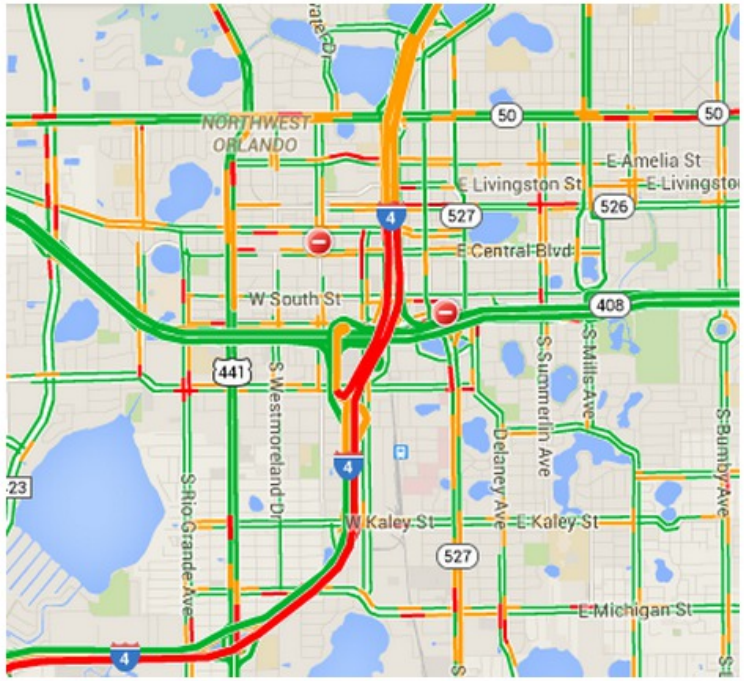
"Now, what are good design comparison sets for workaday diagrams and data displays? Well, put your display pairwise adjacent to the most widely used data-architecture in history: Google maps.
Google Maps are used by millions of people everyday to actually do something: navigate through the real world."

Source: http://www.edwardtufte.com/bboard/q-and-a-fetch-msg?msg_id=0003vq

Edward Tufte and the Google Map Test

"Does my diagram or data graphic compare with the Google maps data practices:

content rich, design straightforward
intense
subtle and effective with color
rich in typographic information
luscious with multiple layers of micro/macro information,
a typographic layer + a symbol layer + a data-map layer
calm but clear scale bar always present (avoids the dequantification found in lots of datviz stuff)
free of chartjunk and optical clutter
acommodating a diversity of users."



Extending Interactivity

With the APIs, we can create custom designs for how users interact with visualizations

Strip Plot Mashup Demo

custom interactions: hovering, dragging

brushing

small multiples as a legend

linking charts

annotations

parametrization

No selections applied

Filters

Region

Eastern

Southern

Western

Sales Type

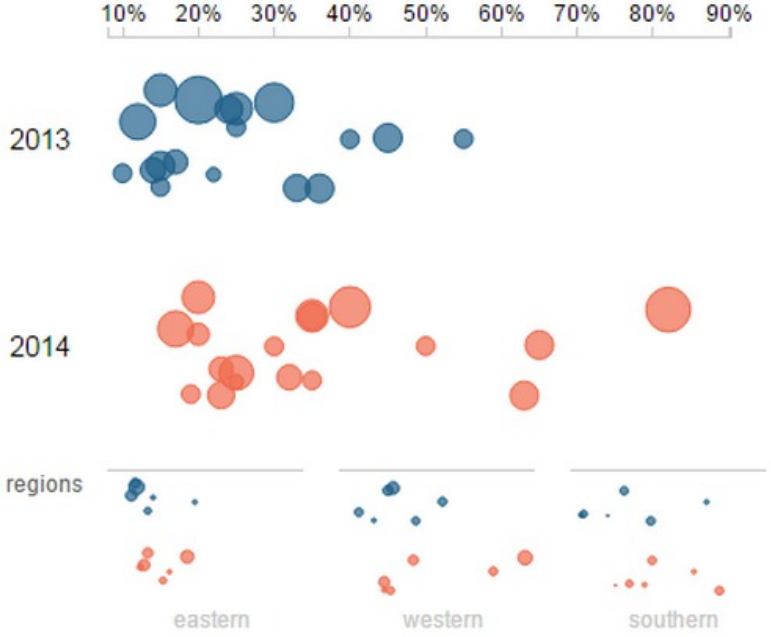
A

B

Office Analysis

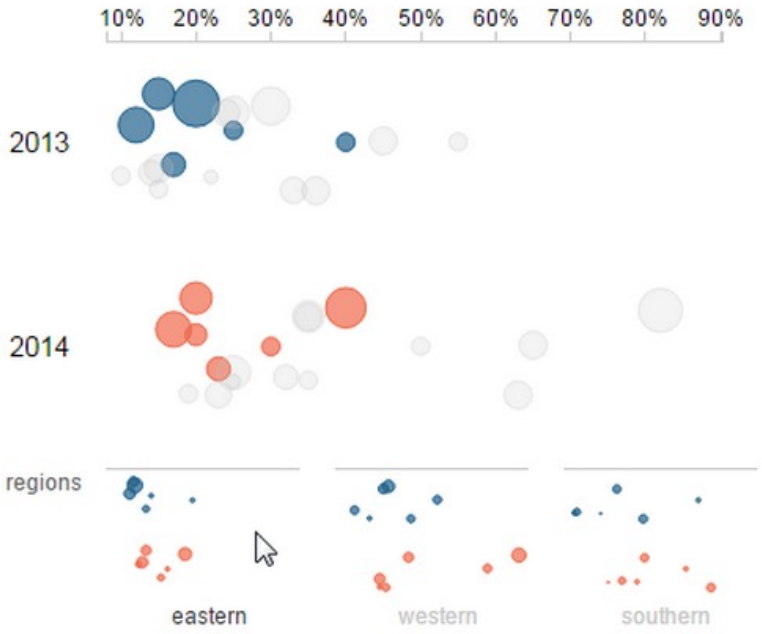
year over year comparison of discount rates

highlight offices with a variance greater than 2%



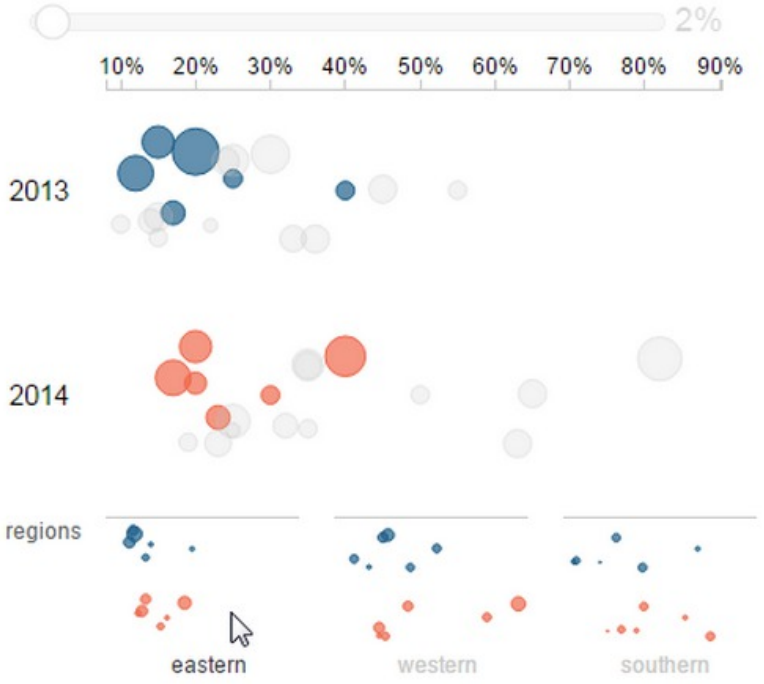
Office	Rate 2013	Rate 2014	Sales 2013	Sales 2014
Glendale	20%	40%	100	76
Chula Vista	25%	20%	20	26
Atlanta	40%	30%	20	20
Omaha	15%	20%	50	50
Orlando	12%	17%	60	60
Raleigh	17%	23%	30	30
Dallas	30%	82%	70	90
Fresno	15%	25%	40	56
Charlotte	25%	35%	50	50
St. Louis	45%	65%	40	40
Seattle	33%	23%	36	36
Baton Rouge	15%	19%	20	20
Albuquerque	14%	32%	32	32
Greensboro	22%	25%	14	14
Philadelphia	10%	35%	20	20
Phoenix	36%	63%	40	40
Newark	24%	35%	38	38
New York	55%	50%	20	20

Small Multiples and Brushing



Small multiples can be used as a legend, combined with hovering interactions for brushing.

Linking Chart Interactions

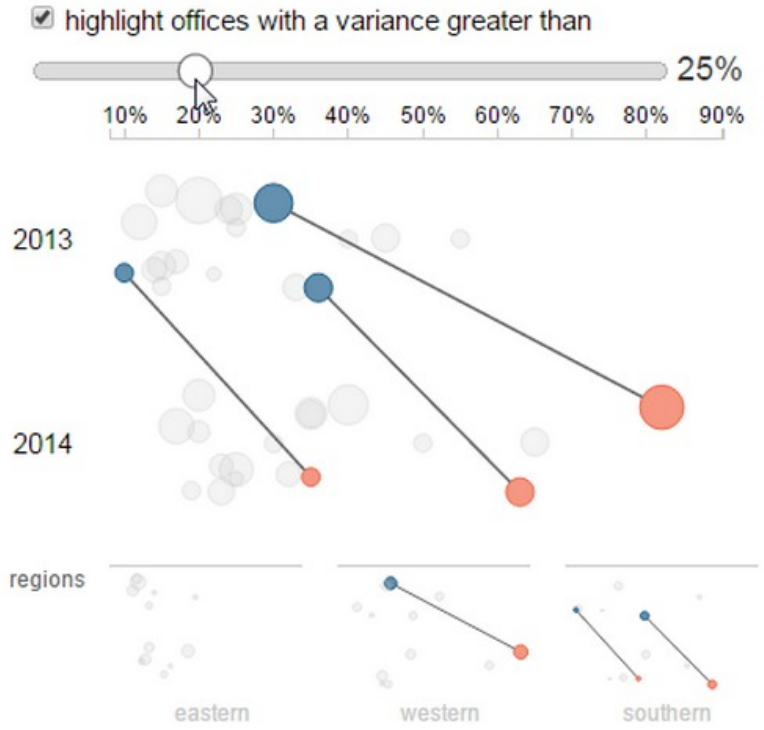


Interactions like brushing can be applied across multiple charts.

Combined with annotations, this can allow for multiple points of analysis.

In this example, the dot plot on the table shows the distribution of Eastern offices by the sorted column of 2014 Revenue.

Parametrization



Parameters can be made available for the user to change how the data is visualized.

These parameters can be implemented with instant feedback, allowing users to intuitively hone in on custom visual analysis.

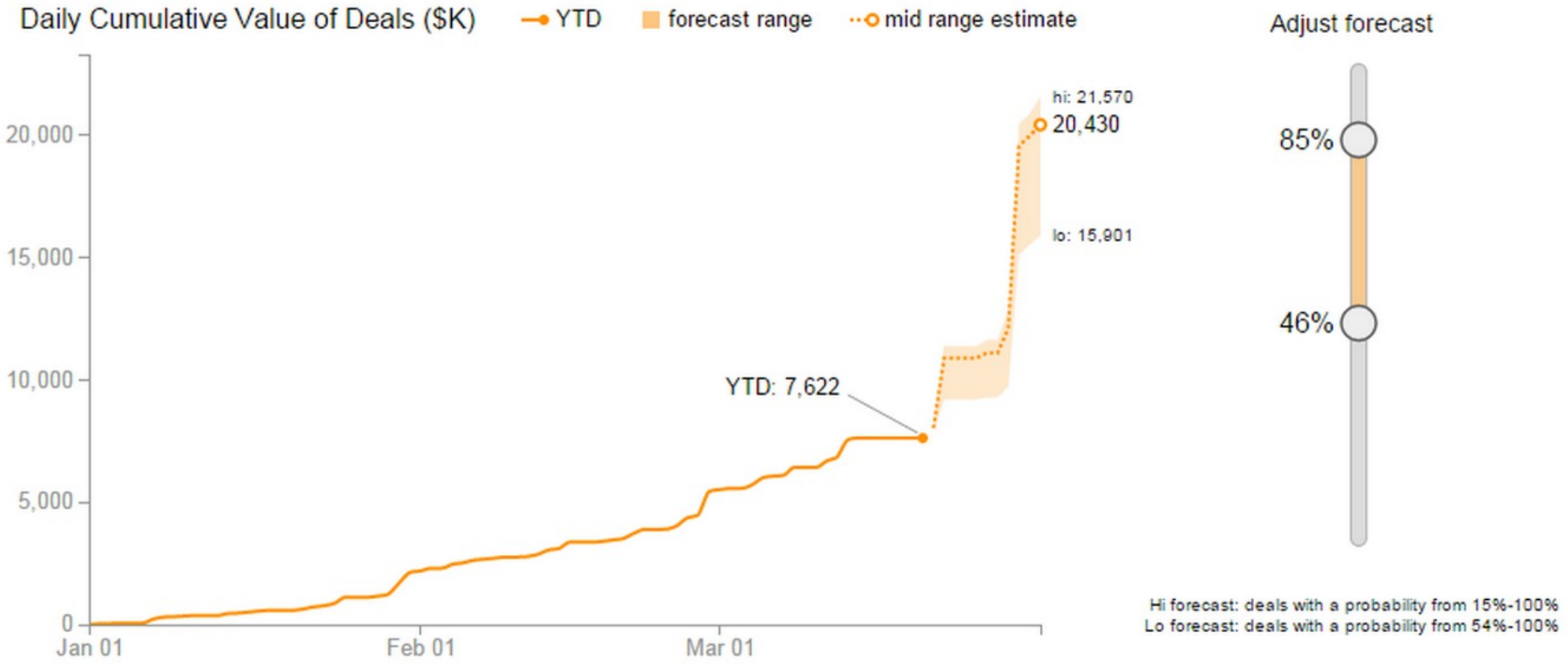
Forecasting Demo

parametrization of data

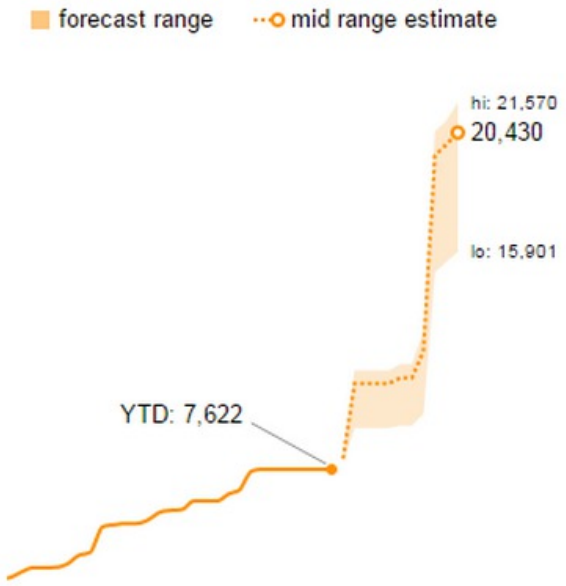
instant feedback loops

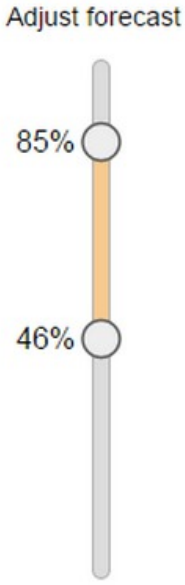
multiple data tables driving one visualization

annotations


Daily Cumulative Value of Deals ($K)
YTD
forecast range
mid range estimate
hi: 21,570
20,430
lo: 15,901
YTD: 7,622
20,000
15,000
10,000
5,000
0
Jan 01
Feb 01
Mar 01
Adjust forecast
85%
46%
Hi forecast: deals with a probability from 15%-100%
Lo forecast: deals with a probability from 54%-100%

Parametrization and Feedback Loops

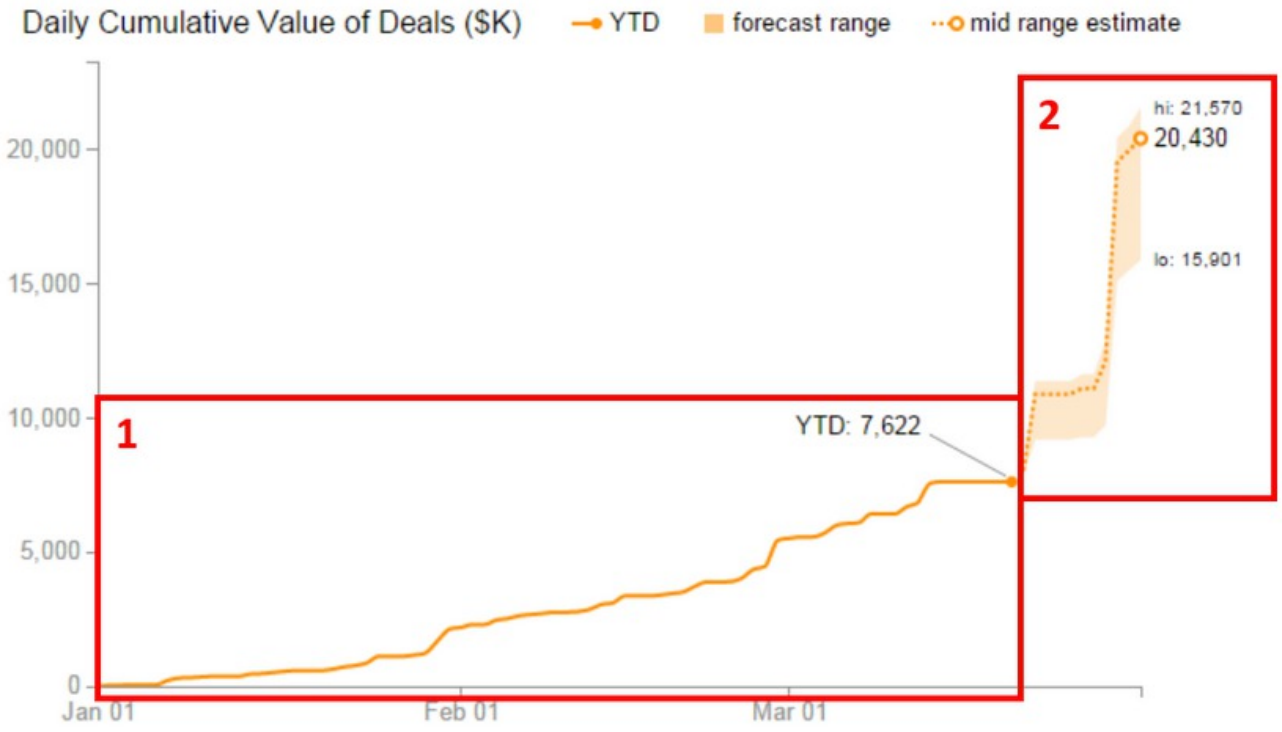




Parameters can be used to control the data that is used within the visualization as well.

The chart responds instantly to forecasting adjustments, allowing the user to creatively analyze scenarios.

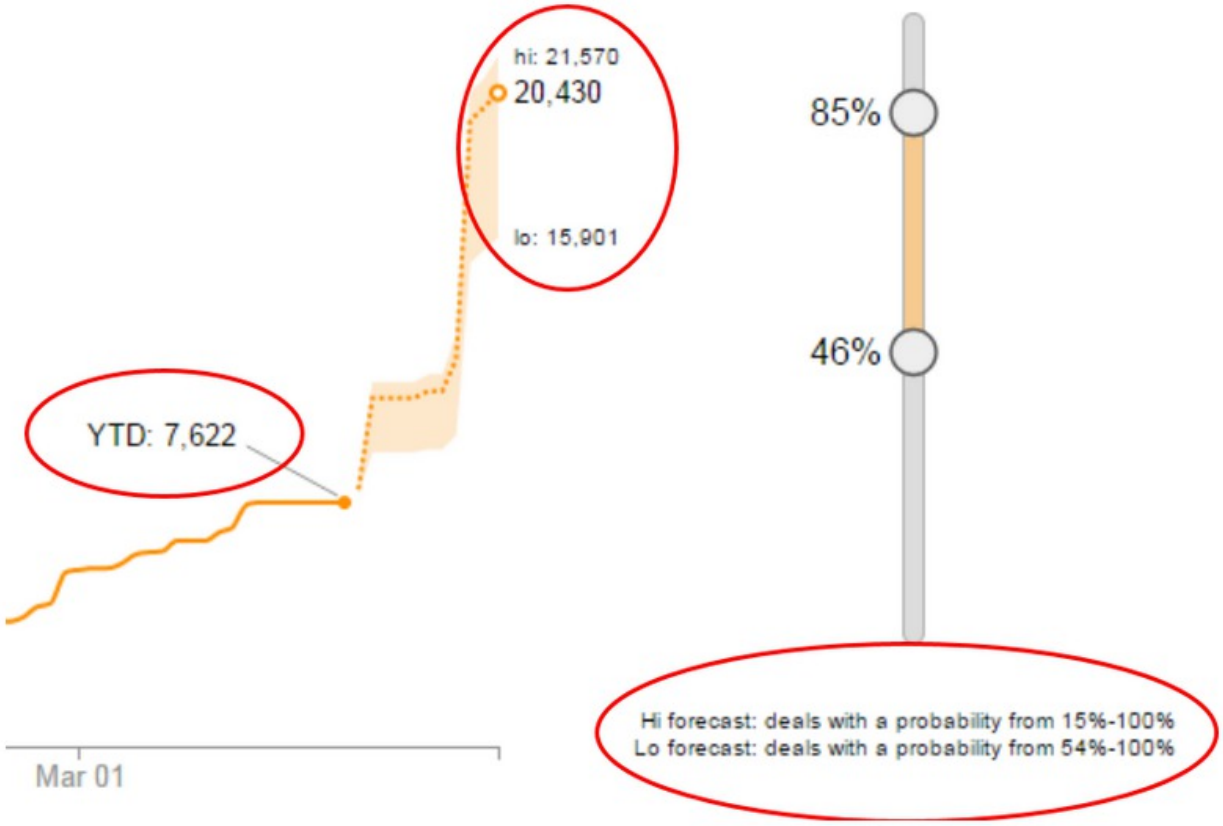
Multiple Data Tables in one visualization



1) summary table of completed deals for the current YTD by day

2) table of forecasted deals, at the deal level. This table is used to render 3 different visuals: the high estimate, mid line, and low estimate

Annotations



Animations in Viz: Object Constancy

"Animated transitions are pretty, but they also serve a purpose: they make it easier to follow the data. This is known as object constancy: a graphical element that represents a particular data point…can be tracked visually through the transition. This lessens the cognitive burden by using preattentive processing of motion rather than sequential scanning of labels." - Mike Bostock

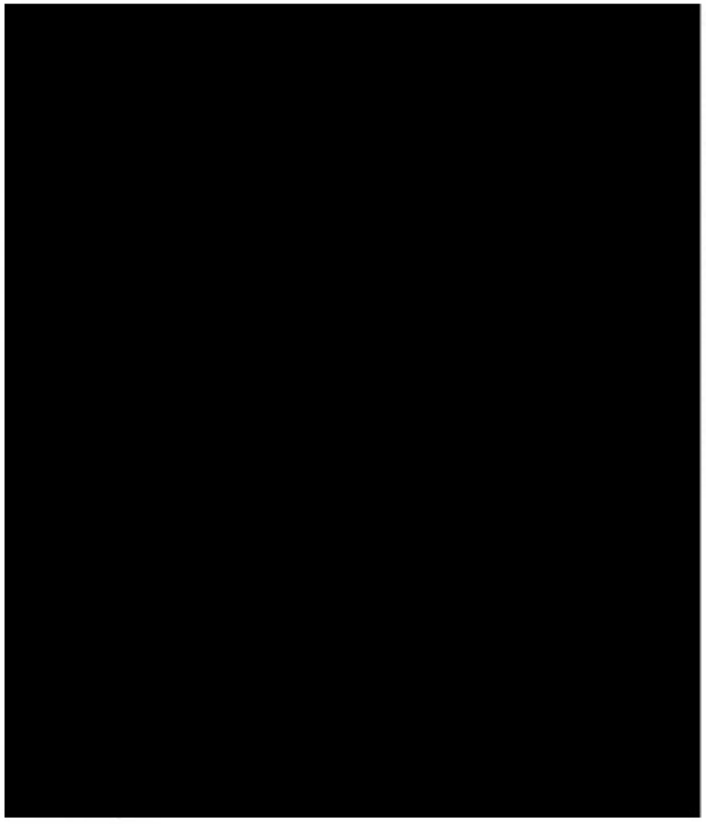
http://bost.ocks.org/mike/constancy/

SPOT THE DIFFERENCE

2009

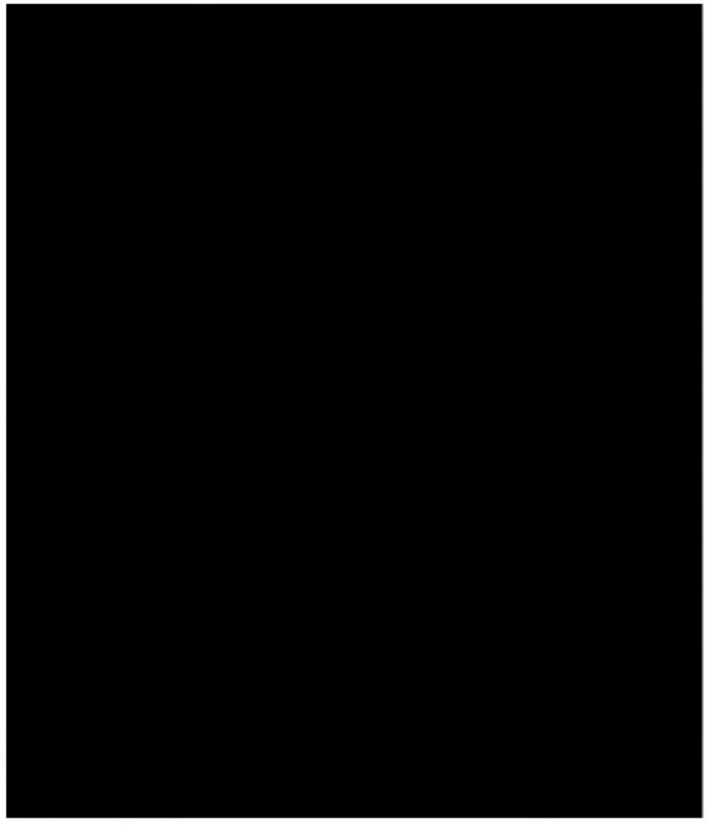
SPOT THE DIFFERENCE

2009



SPOT THE DIFFERENCE

2009



Example Animations in a Bar Chart

Live example in the "US Census 2013" app on sense.axisgroup.com/hub

http://sense.axisgroup.com/sense/app/404c87d4-515e-42f6-a6dd-4fd526bc3886