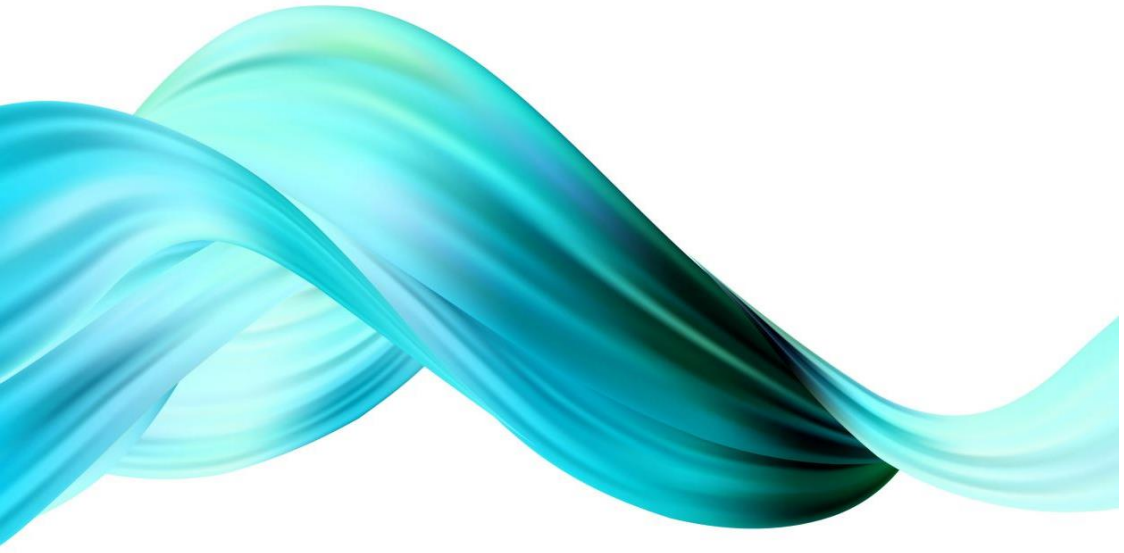


Storytelling with Data Analytics and Dashboards for Insights

Data Analytics

Data analytics is the process and methodology of analyzing data to draw meaningful insight from the data.

Data analytics (DA) is the process of examining data sets in order to find trends and draw conclusions about the information they contain.

Types of Data Analytics

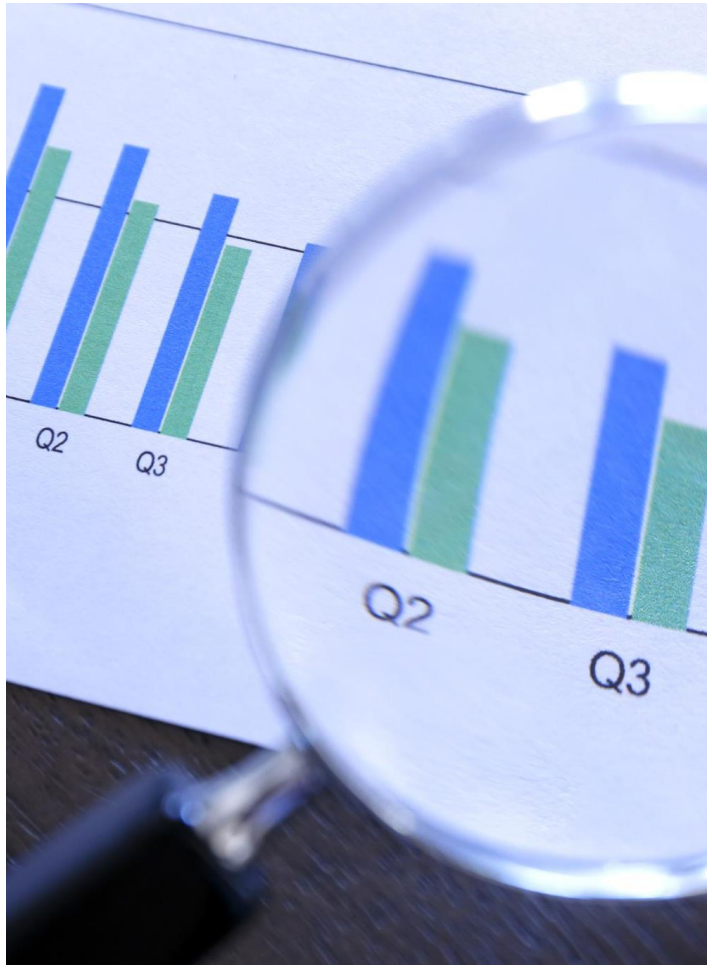
Descriptive analytics describes what has happened over a given period of time.

Diagnostic analytics focuses more on why something happened.

Predictive analytics moves to what is likely going to happen in the near term.

Prescriptive analytics suggests a course of action.

Types of Data Analytics



Descriptive Analytics
Descriptive analytics describes what has happened over a given period.

- Have the number of views increased?
- Are sales stronger this month compared to last month?

Diagnostic Analytics
Diagnostic analytics focuses on why something happened.
This involves analyzing diverse data inputs and forming hypotheses.

- Did the weather affect drink sales?
- Did the latest marketing campaign impact sales?

Predictive Analytics
Predictive analytics examines what is likely to happen in the near future.

- What happened to sales the last time we had a hot summer?
- How many weather models predict a hot summer this year?

Prescriptive Analytics
Prescriptive analytics suggests a course of action based on predictive insights.

- If the average likelihood of a hot summer, as measured by these five weather models, exceeds 30%, we should add an evening shift at the brewery and rent an additional tank to increase output.

Descriptive analytics for transportation logistics

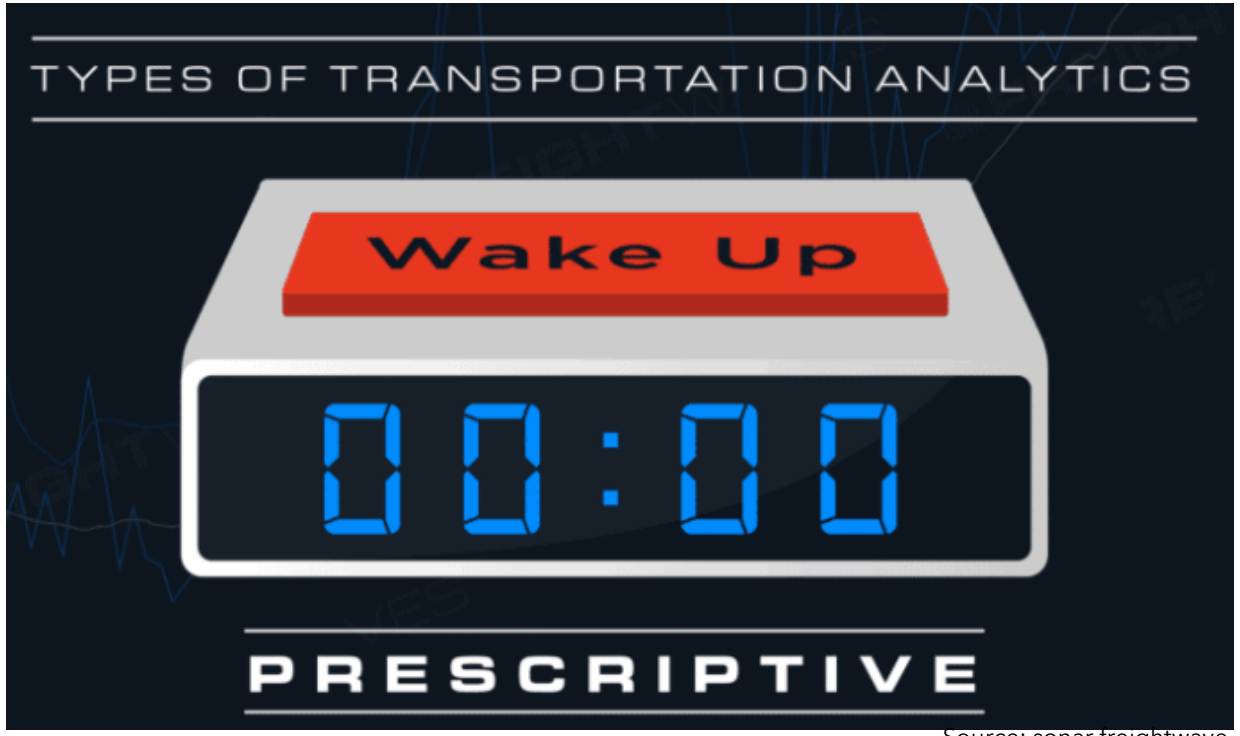
Source: sonar.freightwave

Source: sonar.freightwave

Diagnostic analytics and data interpretations

Source: sonar.freightwave

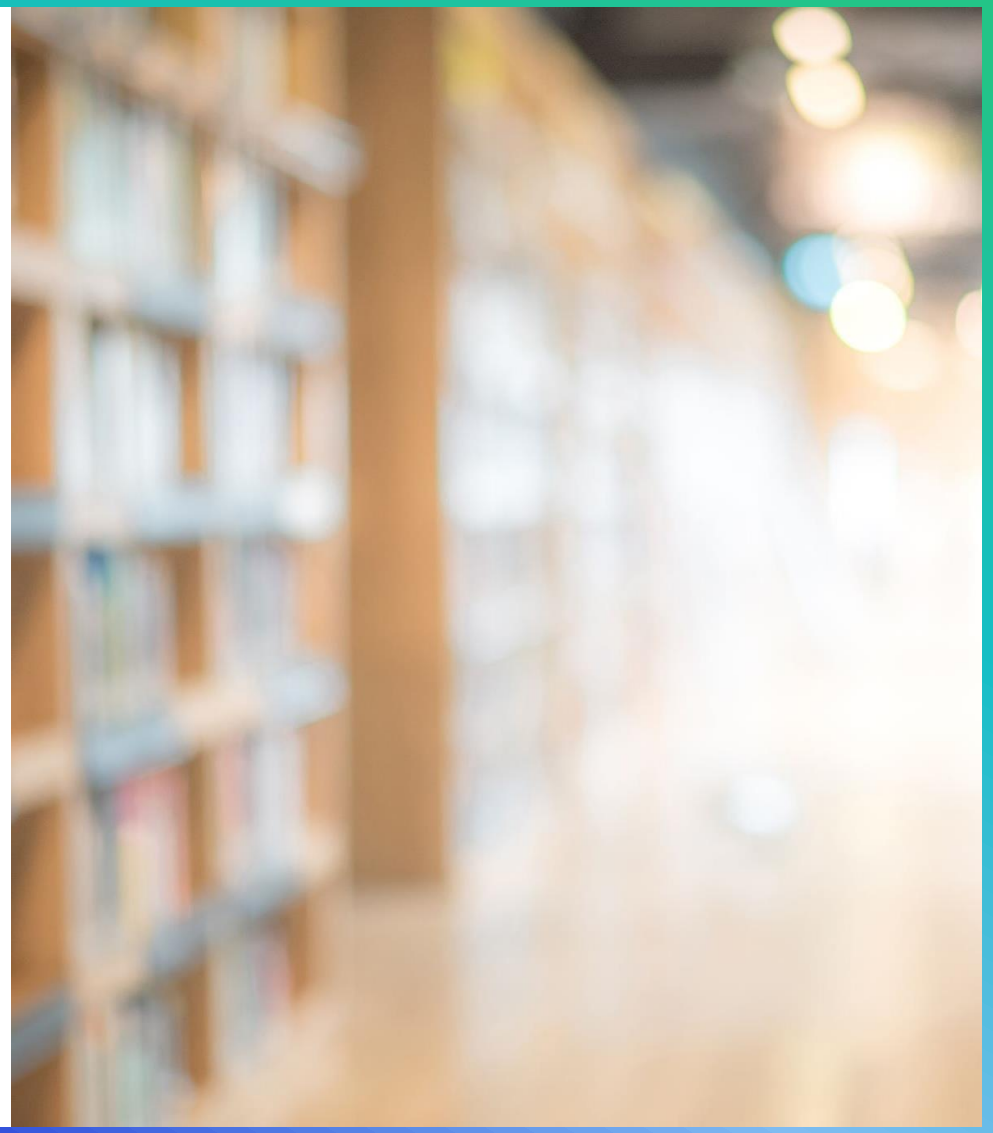
Predictive analytics that impacts shipping chains

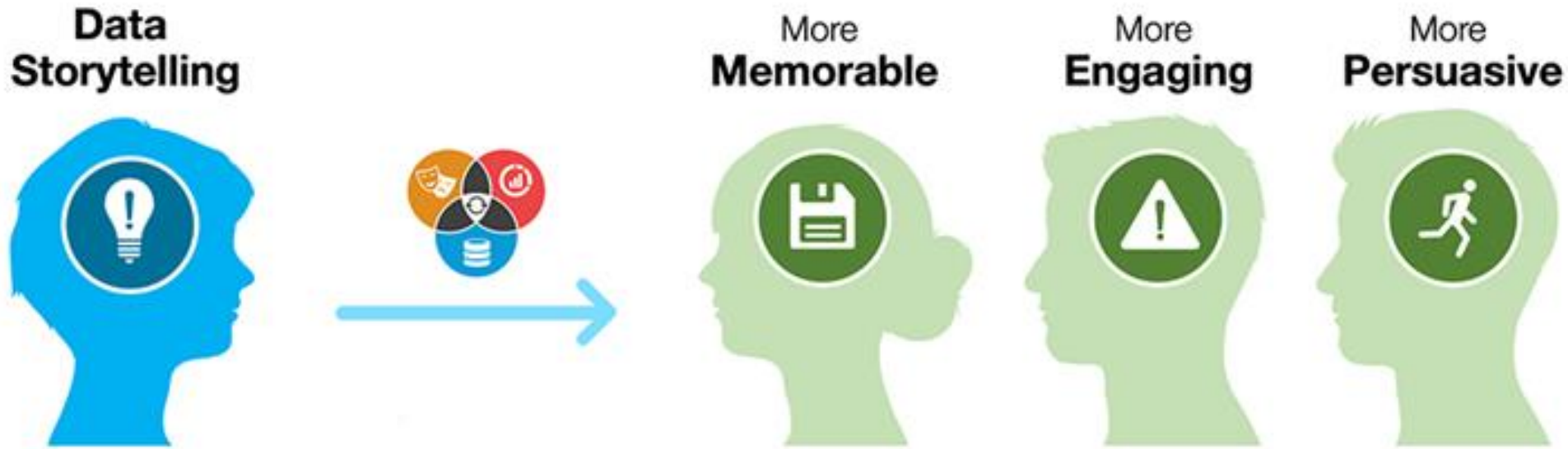


Source: sonar.freightwave

Prescriptive analytics for preventative planning

Data Storytelling





Why Data Storytelling ?

Why Data Storytelling ?

- Neuroscientists find the brain responds uniquely to stories, evoking emotions, while statistics are merely heard.

- Emotion plays a vital role in decision-making, making storytelling a powerful tool to connect emotionally and simplify data processing.

Why Data Storytelling ?

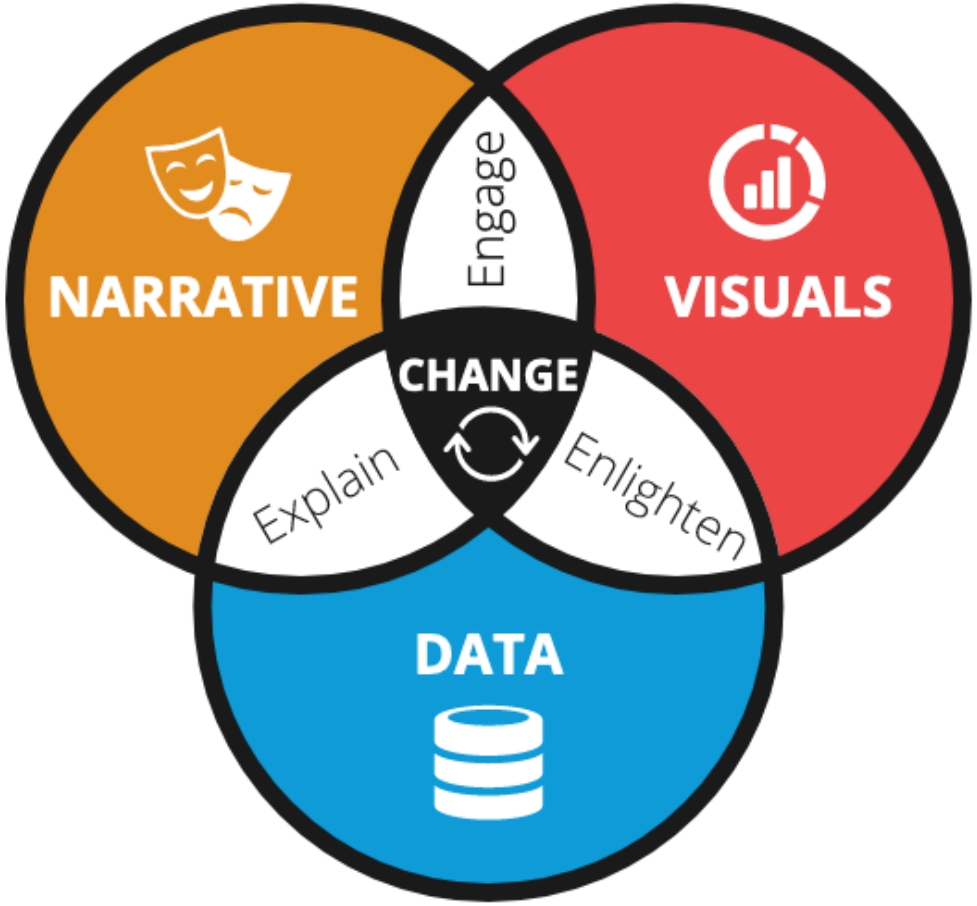
- In what ways can data storytelling skills contribute to improved collaboration and alignment across different teams and departments?
- What role does data storytelling play in fostering a culture of data-driven decision-making within an organization?
- In what ways can data storytelling improve your business's competitive edge and overall success in today's data-driven landscape?
- How can data storytelling enhance your business's ability to communicate complex insights to non-technical audiences?

Data Storytelling

- Storytelling is the most powerful way to put ideas into the world today,” says Robert McKee, a screenwriting guru.
- Data storytelling serves as the key to transforming data into insights that inspire action and generate value.
- Today's corporate world is saturated with poorly designed slides cluttered with inappropriate charts.

Framework

How to Drive Change with Data, Narrative, and Visuals, formulated a valuable framework for building data stories.



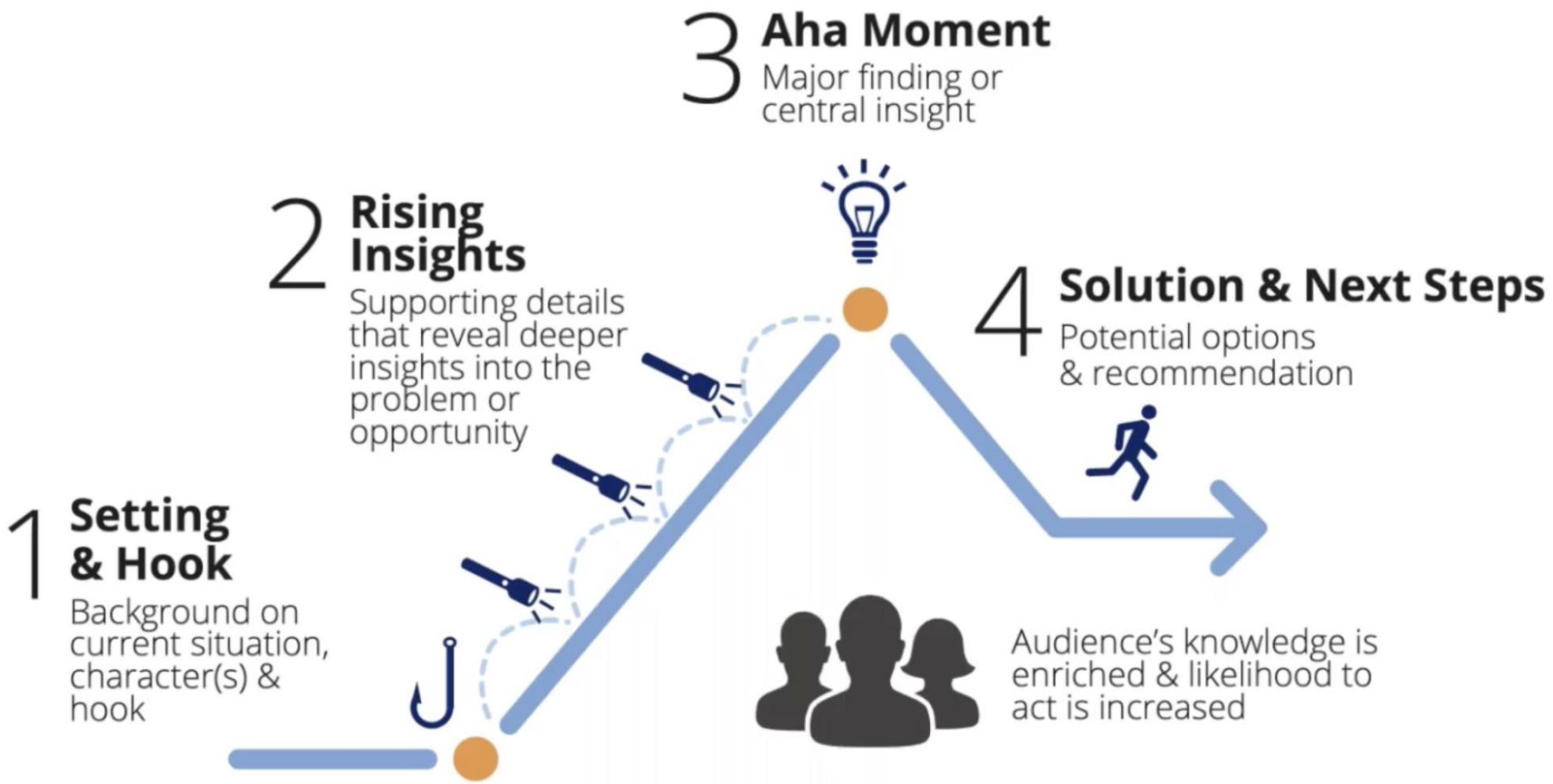
Source: Brent Dykes

Data Storytelling

Element	Description
Data	The foundation of a data story, involving the analysis of data to uncover key insights and their meaning for effective communication.
Narrative	The organizational structure of a data story, encompassing the arrangement of information into a coherent and engaging storyline to convey insights.
Visuals	The visualization of complex data through charts, diagrams, and images, aiding the audience in perceiving anomalies, patterns, and trends effectively.

Narrative Structure

- Data stories follow a classic narrative pattern: setup, insights, central revelation, and actionable recommendations.
- Data storytelling's narrative structure encompasses scene-setting, insight delivery, and recommendation formation.

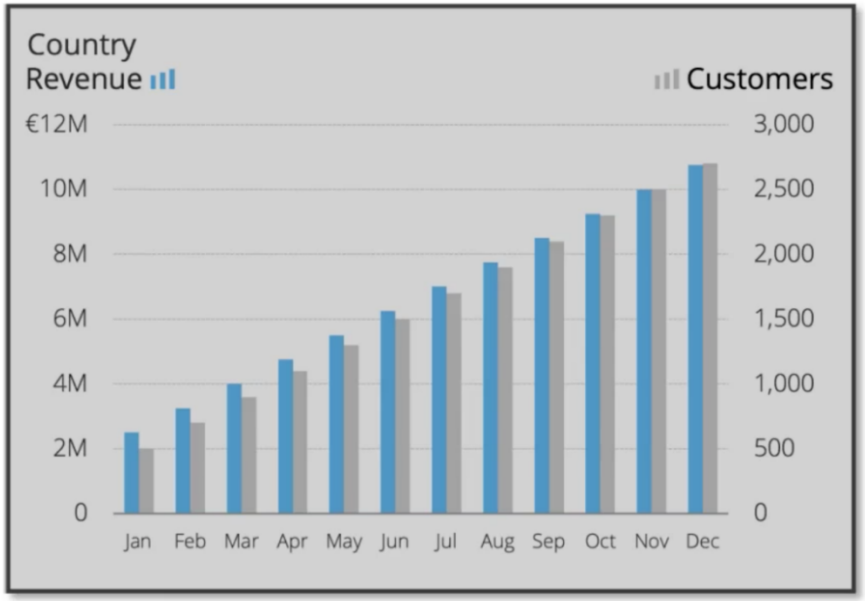

3 Aha Moment
Major finding or central insight
2 Rising Insights
Supporting details that reveal deeper insights into the problem or opportunity
4 Solution & Next Steps
Potential options & recommendation
1 Setting & Hook
Background on current situation, character(s) & hook
Audience's knowledge is enriched & likelihood to act is increased

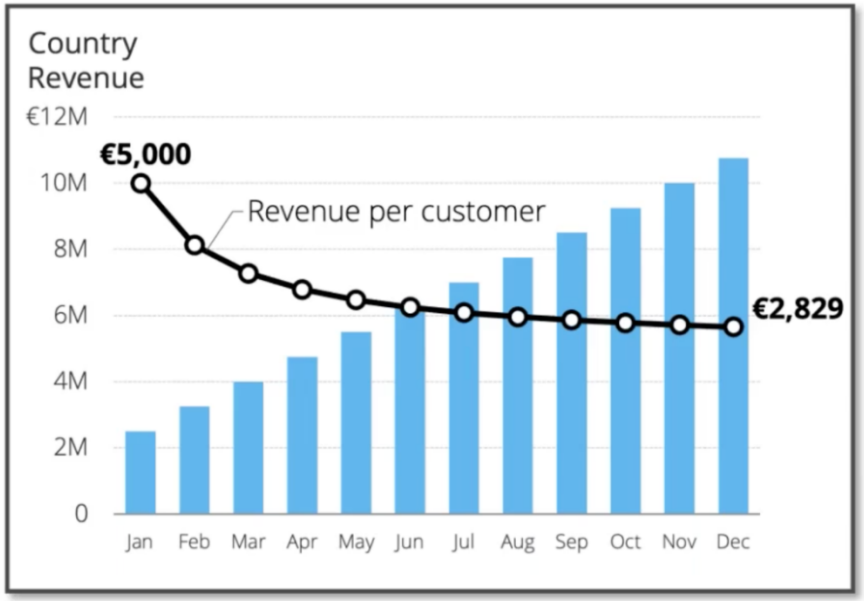
Data

- Avoid cluttering charts with too much data to keep data stories clear and understandable.
- Selecting the right data is vital for creating effective data stories.

Identify Right Data for Your Data Story

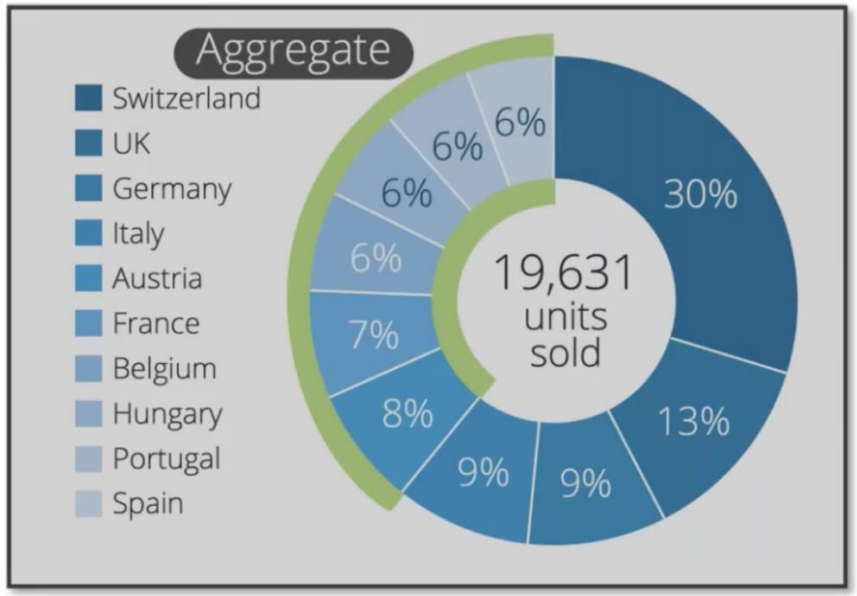
Calculated metrics may be more insightful than total values.

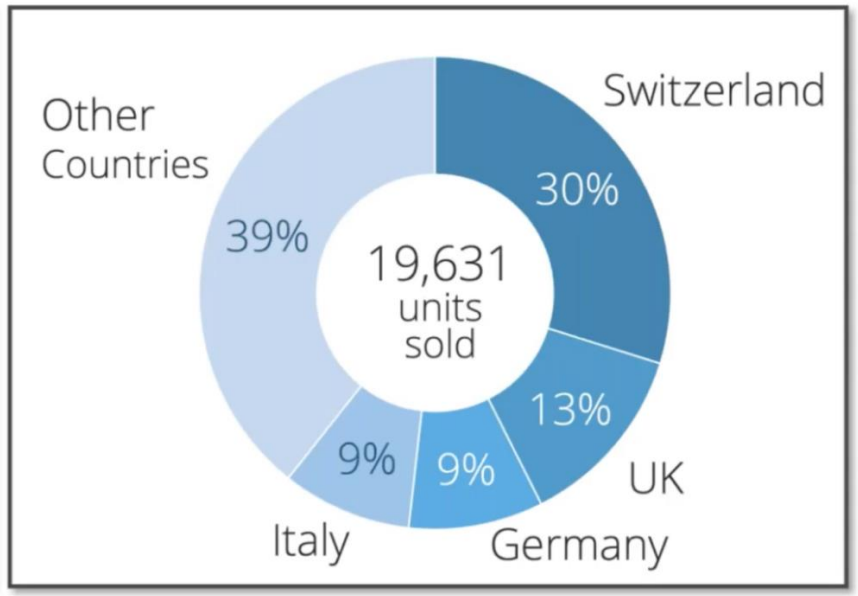




Aggregate Less Important Information

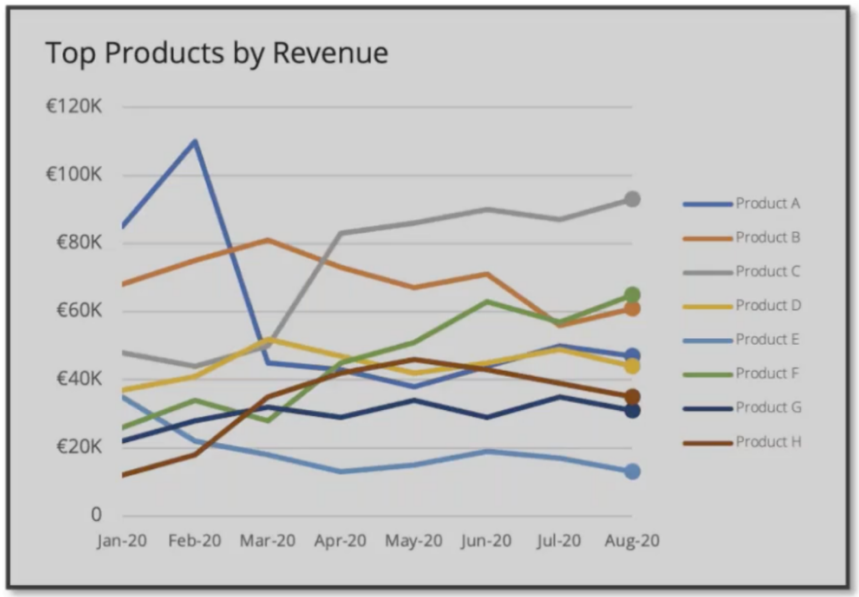
To simplify charts, you can **aggregate less critical data** to reduce the cognitive load.

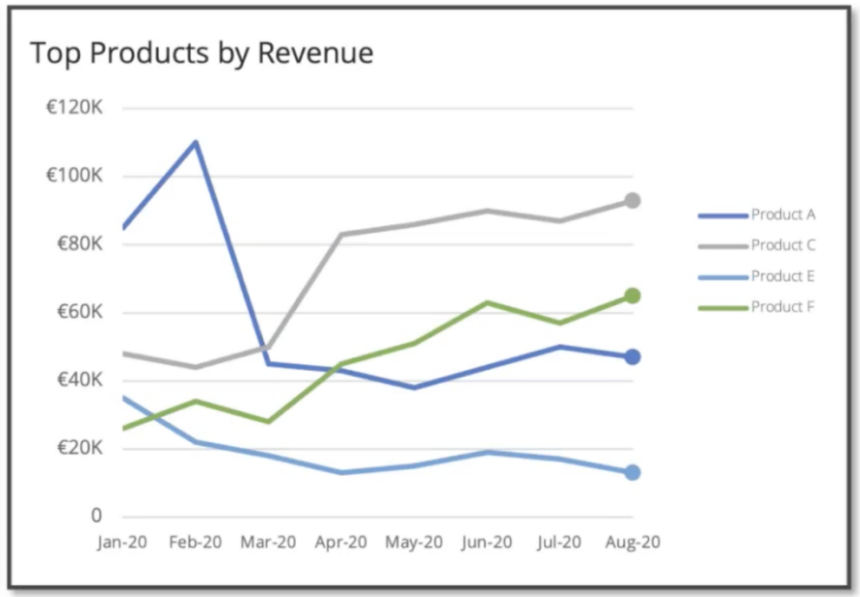




Remove Surplus Data that Isn't Needed

Ask yourself **what is essential** to making your point. Remove what's unnecessary.





Visuals

+ **Choose the right visualization**

Effective visualizations vary based on the data story's context; select the most suitable chart for the message.

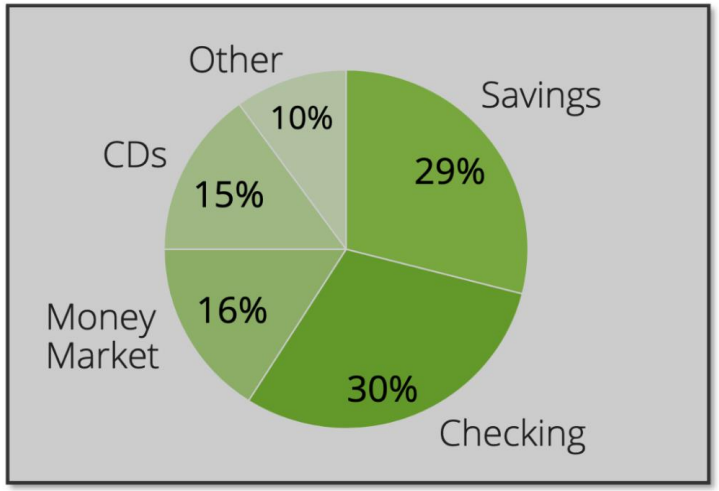
+ **Adjust visuals for the message**

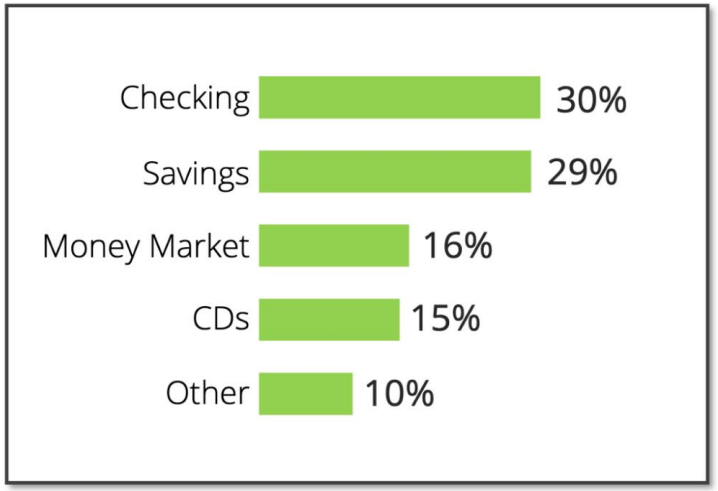
Proper data storytelling aligns visuals with the audience's needs, ensuring clarity in conveying the point.

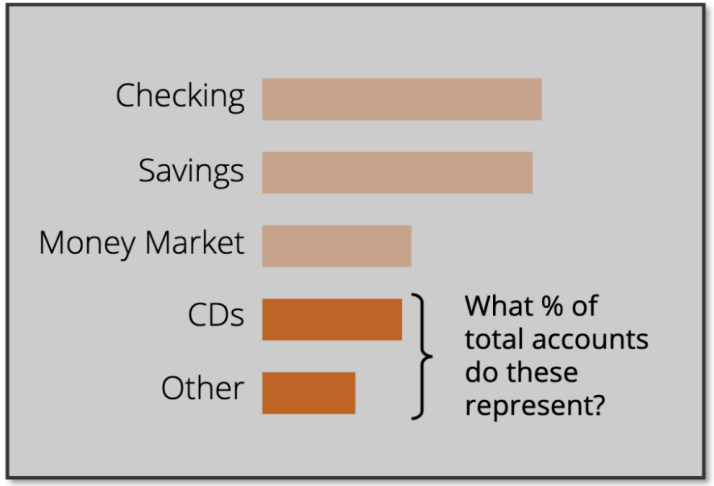
+ **Direct audience attention**

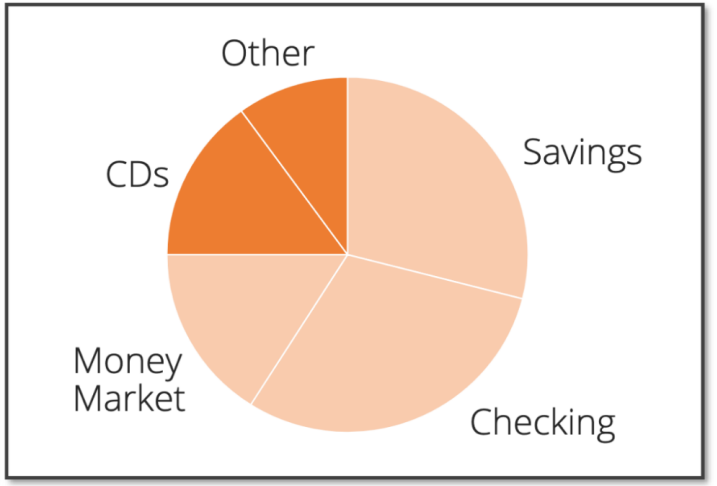
Highlighting key points in a chart captures the audience's focus, separating important insights from distractions.

Visuals - Choose the appropriate visualization

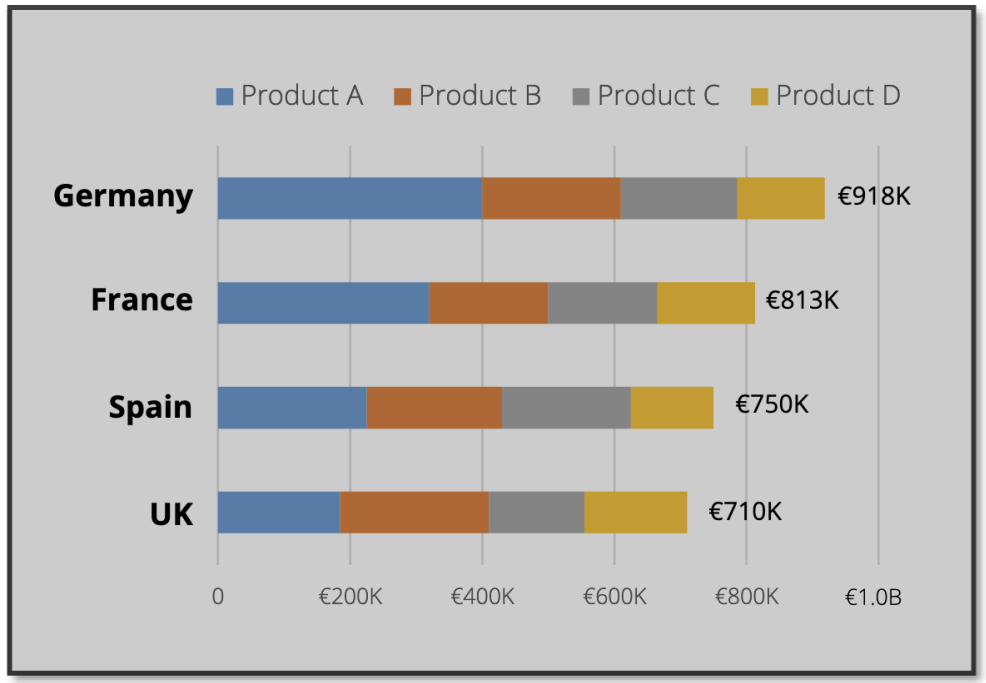


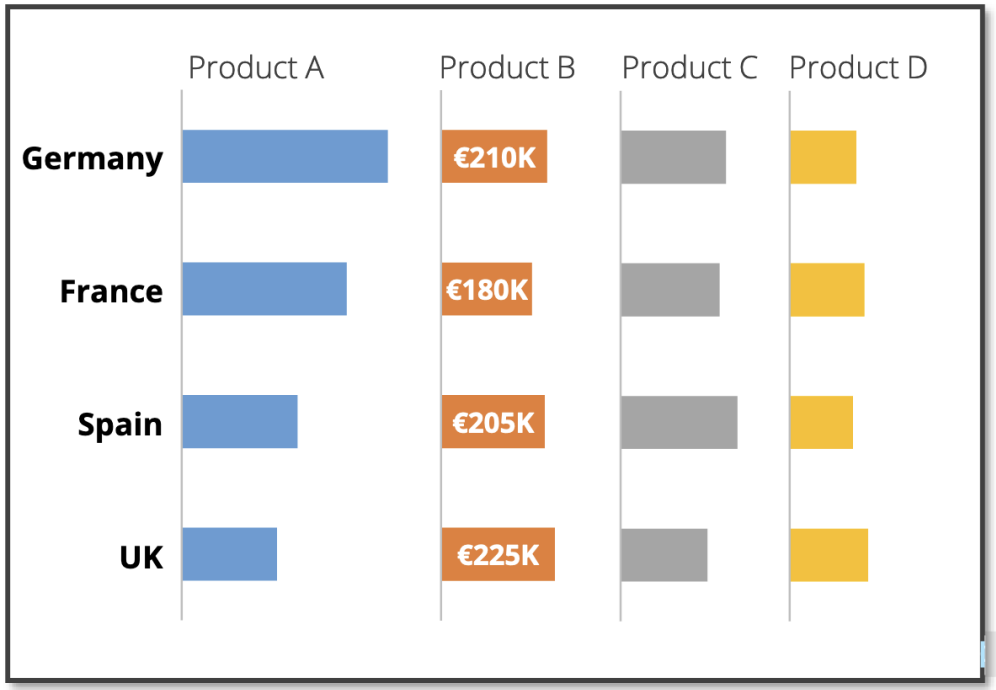






Visuals - Calibrate the visuals to the message





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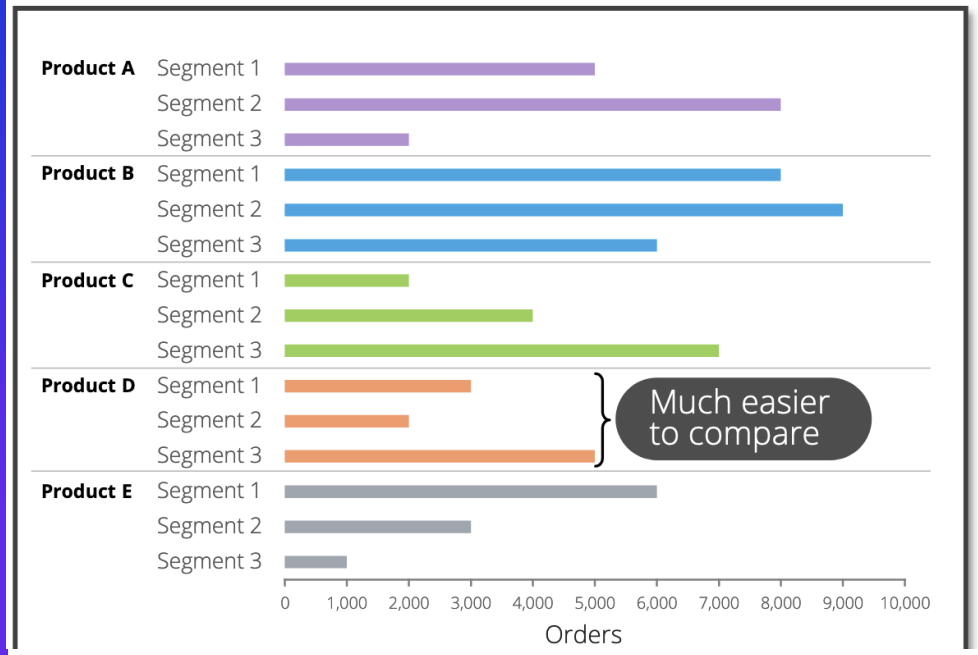
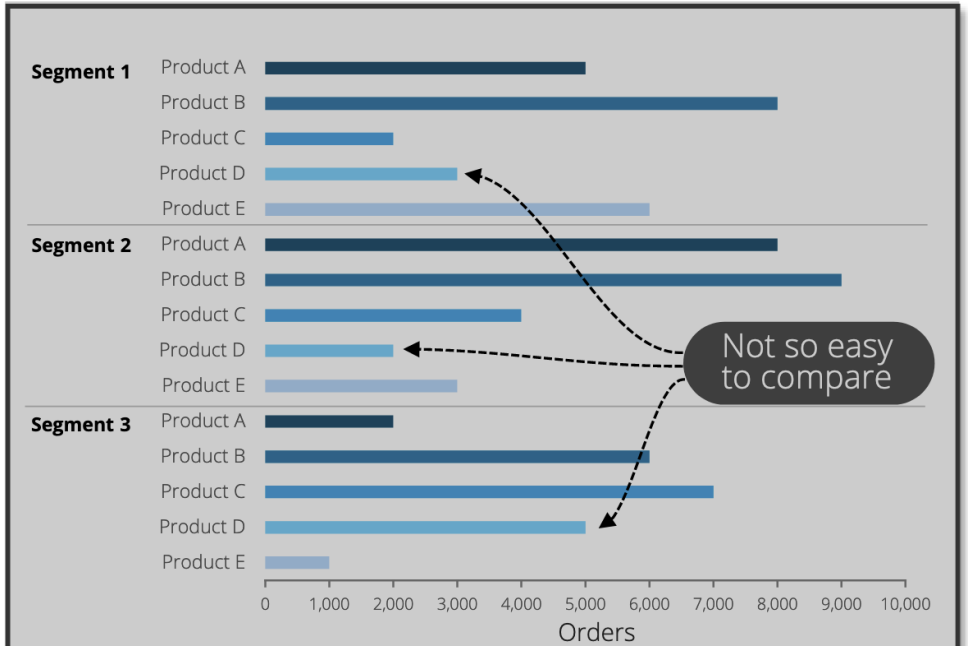
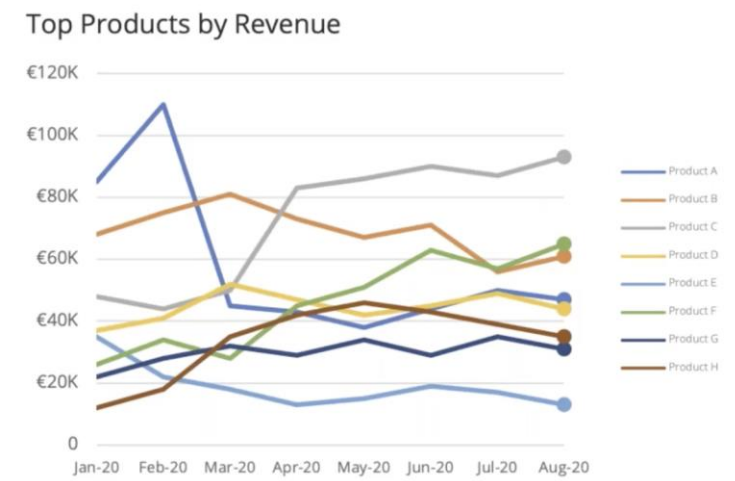
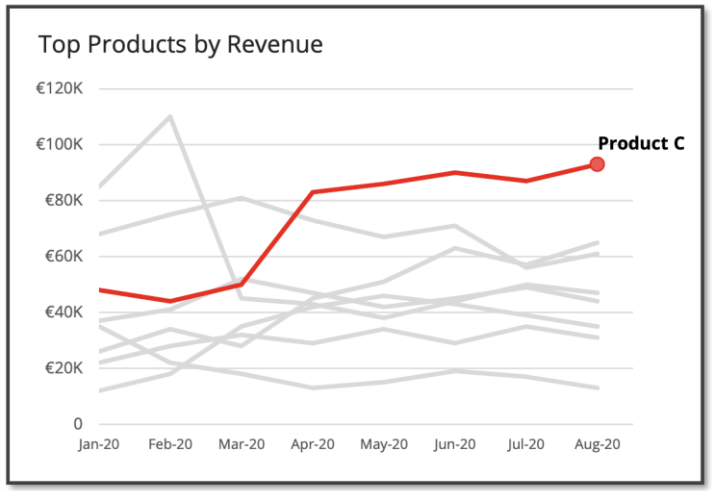
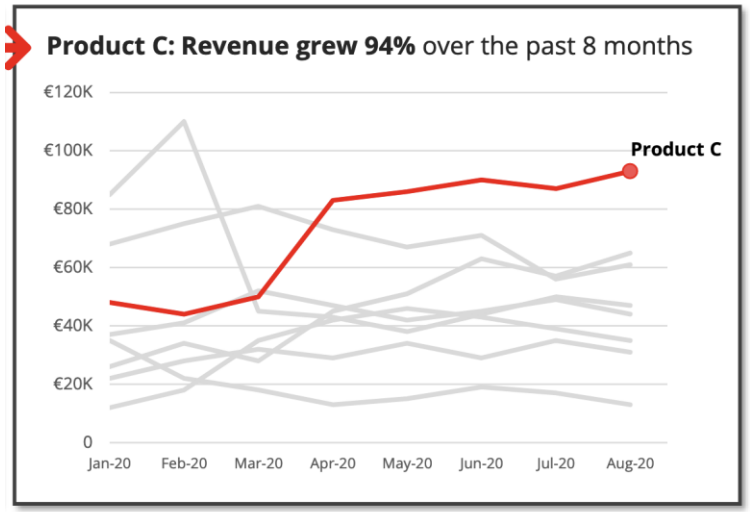


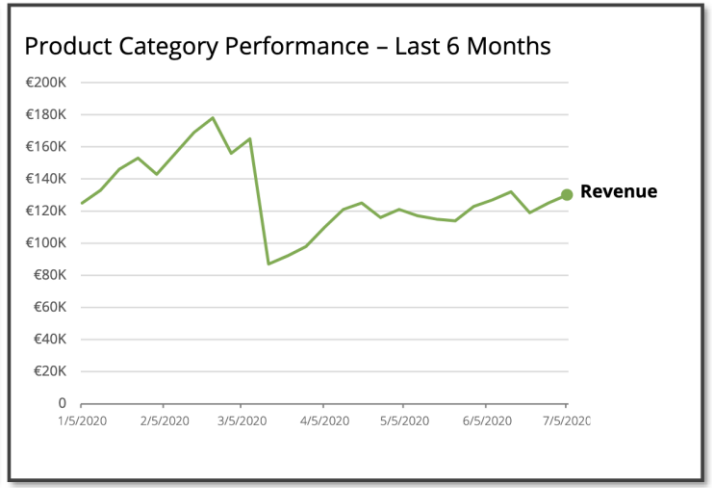


Visuals - Focusing the attention of the audience

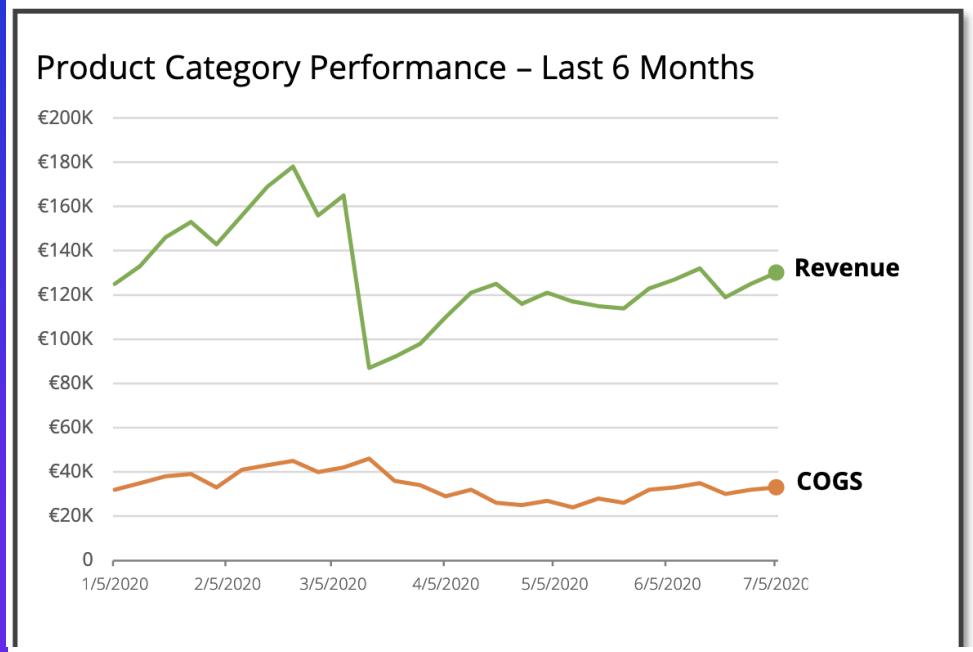


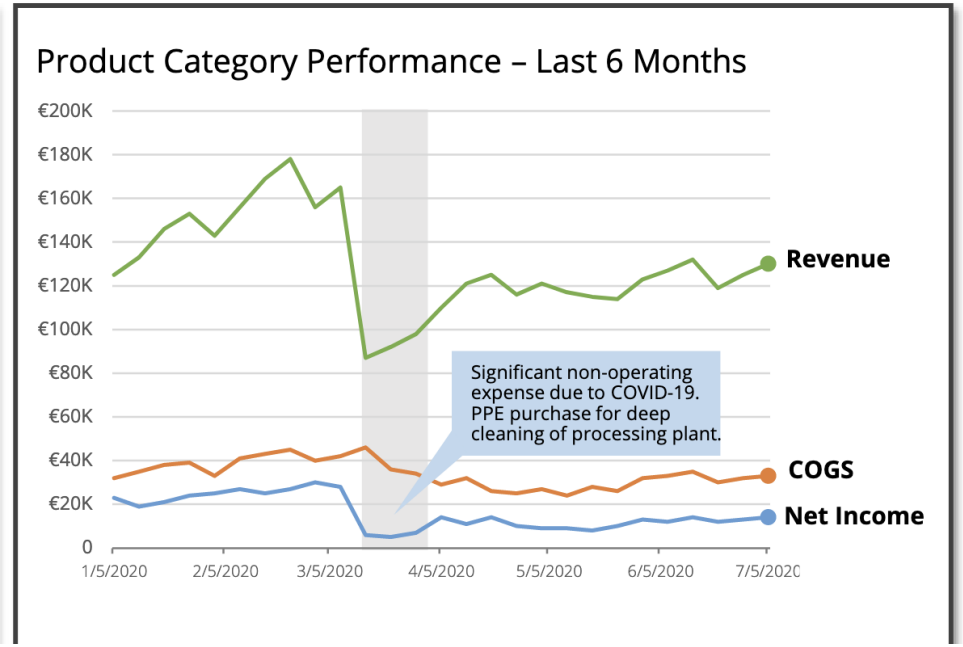




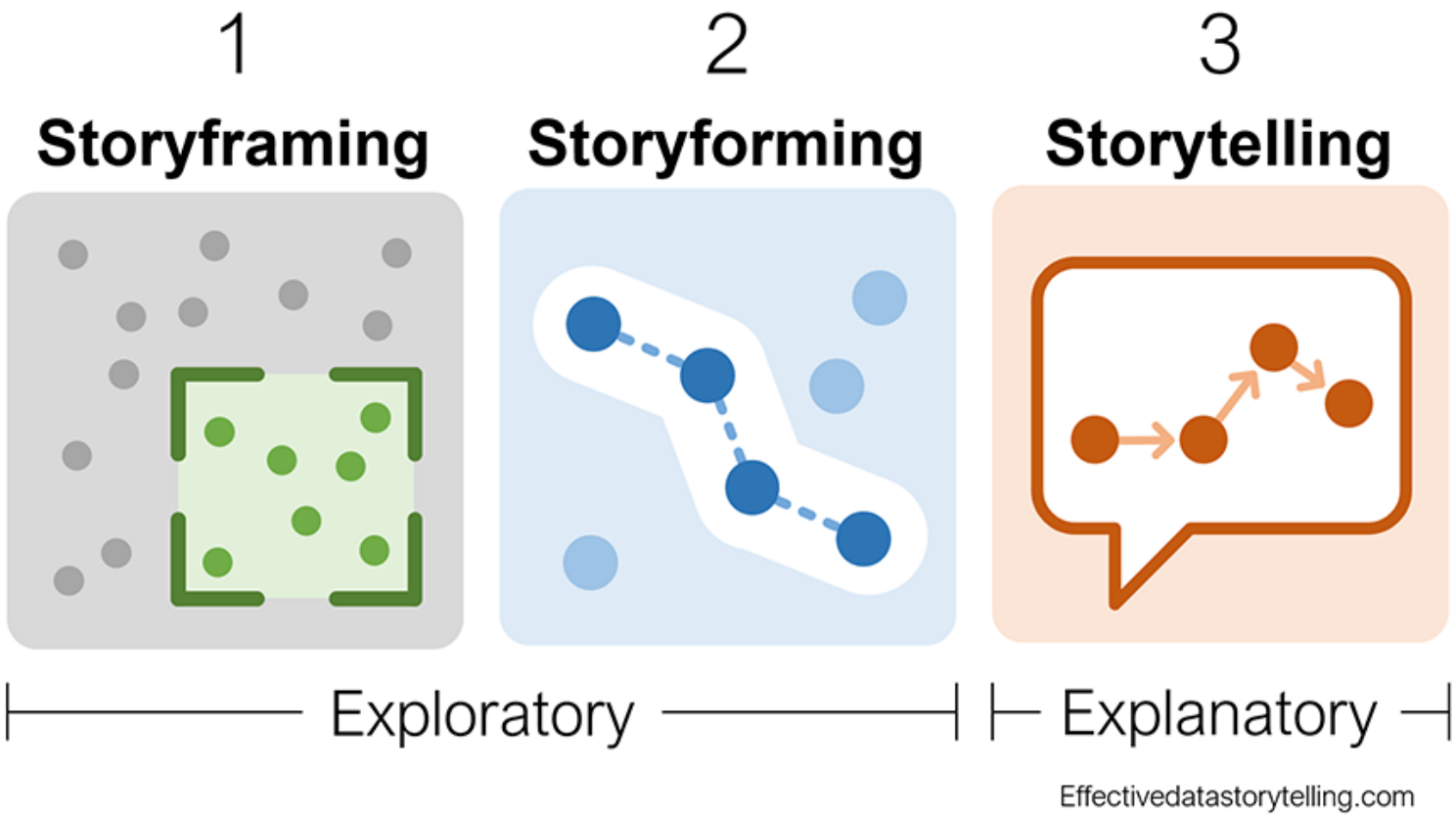


Visuals - Focusing the attention of the audience





Essential Steps Before Data Storytelling, Storyframing and Storyforming



Storyframing and storyforming are exploratory steps.
After you've found an insight that you want to communicate with others, you transition to data storytelling, which is explanatory.

Key Questions at Each Stage of Data Storytelling

Stage	Questions
Storyframing	What are the business objectives and challenges of my target audience?
	What data is aligned with their business goals and challenges?
	What anomalies, trends, and patterns do I observe in this data?
Storyforming	What key observations from the data should be explored further?
	What do I understand about these changes in the data and the internal/external factors contributing to them?
	What impact will they have on the business if they continue?
Storytelling	How can I communicate the insights with a narrative and visuals to aid understanding?
	What context and supporting details are necessary to explain the insights to my audience?
	How can I persuade decision-makers to act upon the insights?

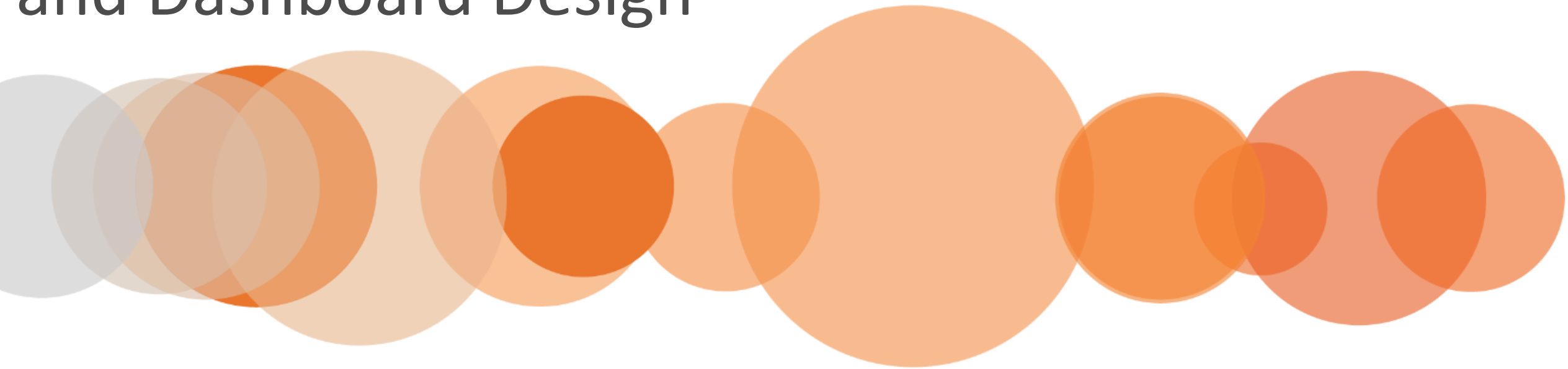
Exploratory vs. Explanatory And Dashboard Design

Goals

By completing the topic, students will:

- Learn Exploratory vs. Explanatory visualizations
- Discuss the definition of a dashboard
- Learn fundamentals of dashboard design
- Learn what makes data visualization actionable

Exploratory vs. Explanatory and Dashboard Design

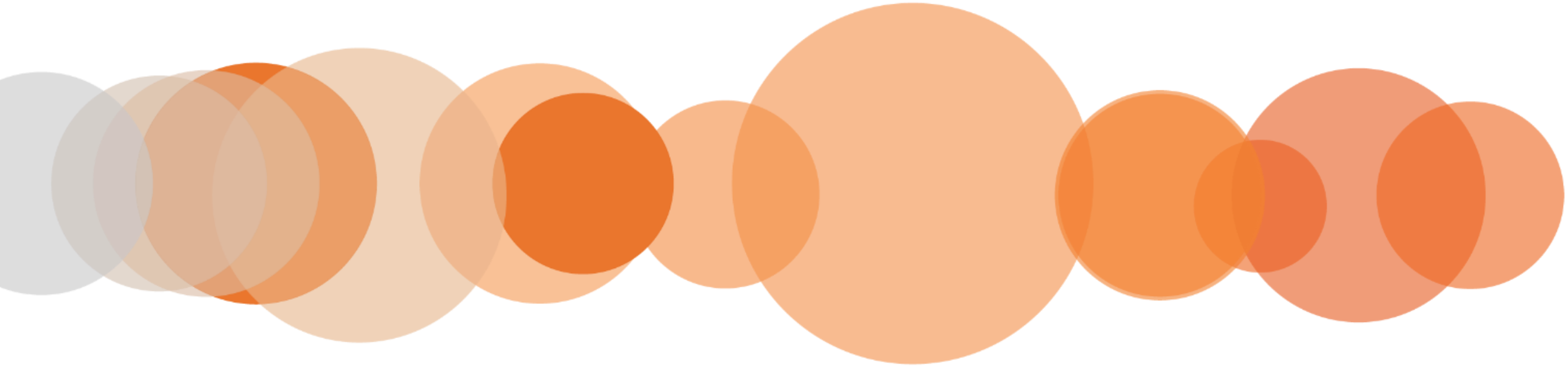


Process of Discovery

No matter how well-designed your graphic is, users will want to know "why" or to look at things in a different way.

- Exploratory discovery
  - Give users tools to find the answer
  - Allows analysts and power users to find new patterns and relationships
- Directed discovery
  - Show the answer to a pre-known question
  - Options to change basic parameters
  - Suitable for general consumption by a wide variety of users

What is a dashboard?



Dashboard

A dashboard is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance.

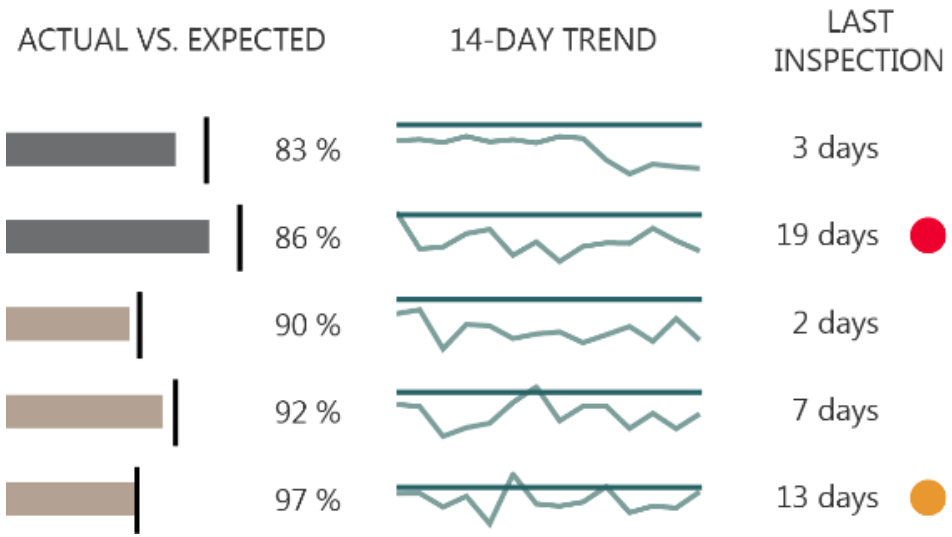
- Stephen Few (2004)

From "Dashboard Confusion" in Intelligent Enterprise magazine, March 20, 2004

Dashboards as Directed Discovery

Another way to think about it:

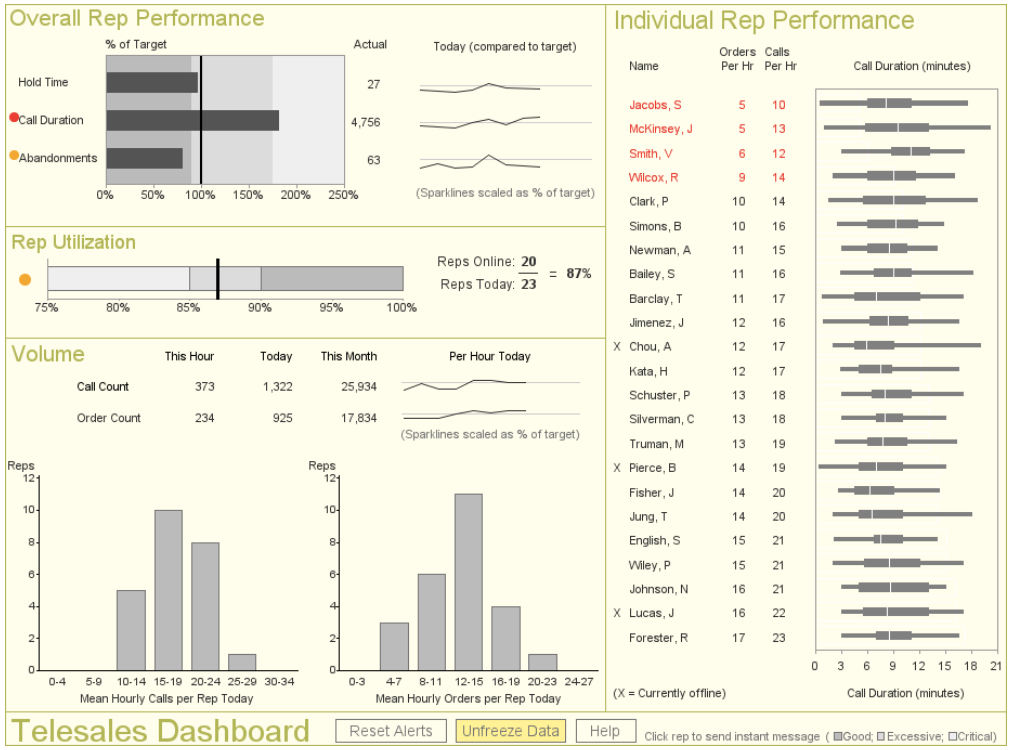
An information display designed for people
to help maintain situational awareness.



Source: *The Big Book of Dashboards* (BigBookofDashboards.com)

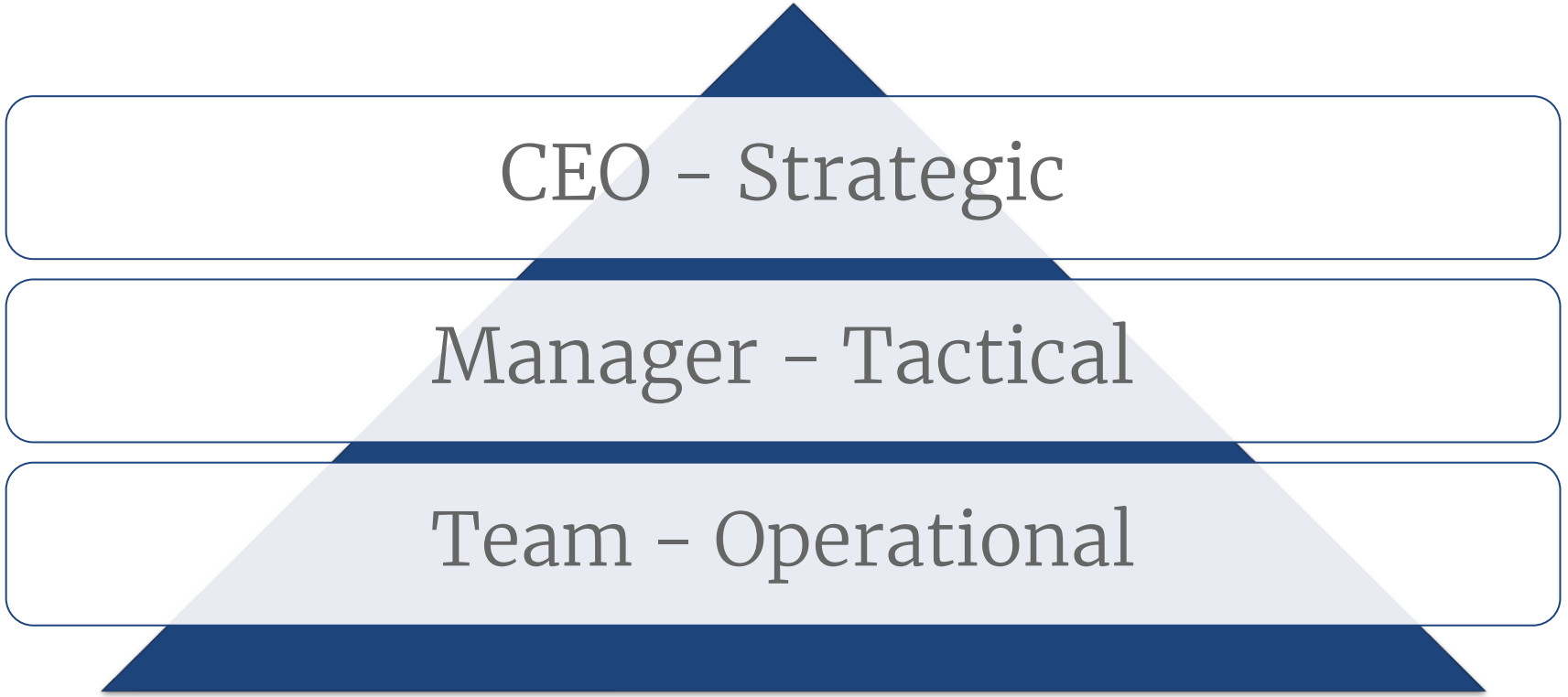
Dashboards – Supporting Attributes

- Information is presented using small, concise, direct, & clear display of media
  - Clearly stated messages
  - Each point should be limited to the space needed
- Customized
  - tailored to the needs of a specific group or individual
- Consistent layout
  - Data changes over time
  - Interface is consistent *(until it's time for the next revision)*



Few, Stephen (2013), *Information Dashboard Design*, p. 28

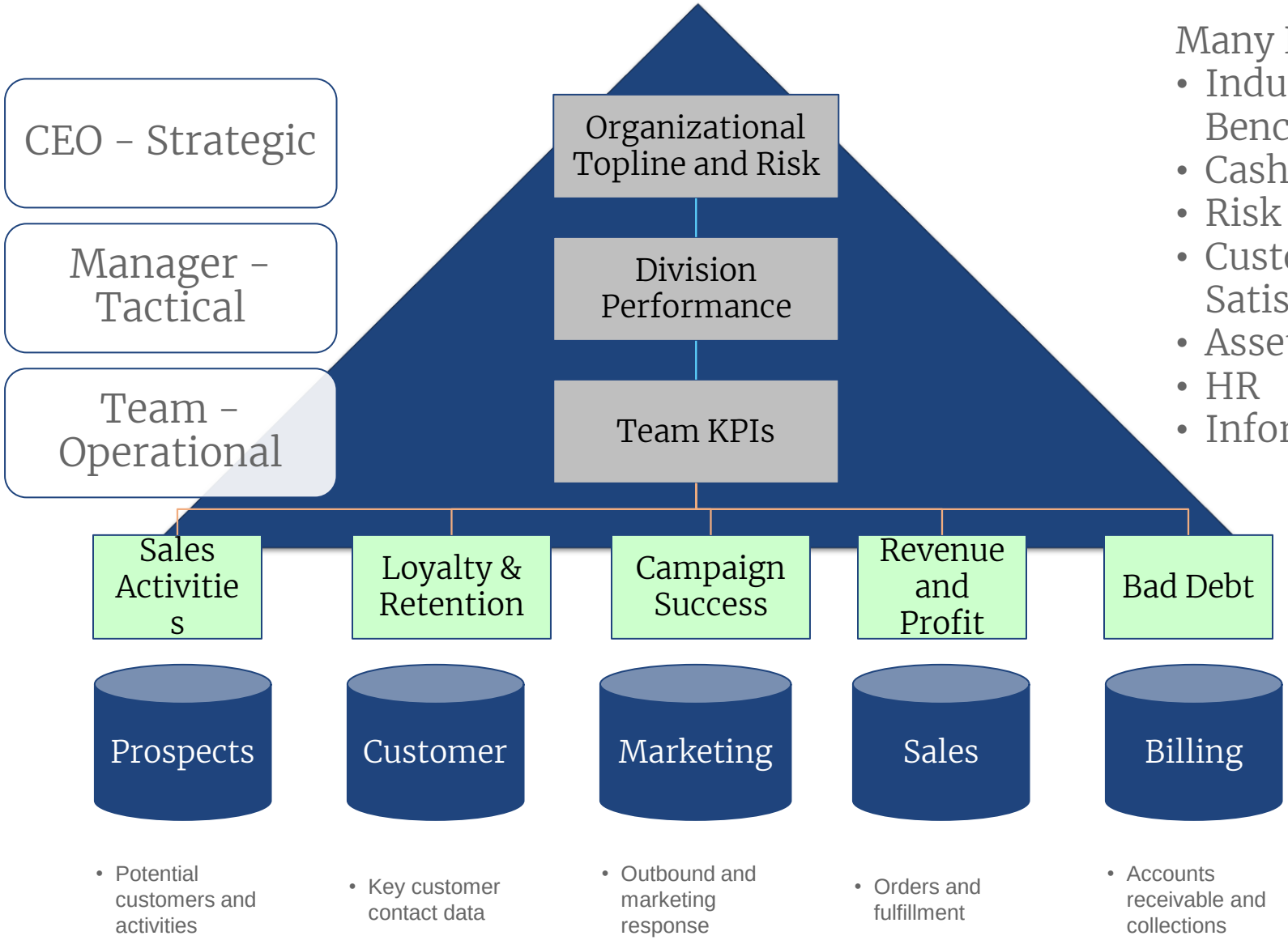
Dashboard and KPI Rollups
Different Views for Levels of the Organization



- Potential customers and activities
- Key customer contact data
- Outbound and marketing response
- Orders and fulfillment
- Accounts receivable and collections

KPI and Scorecard Rollups

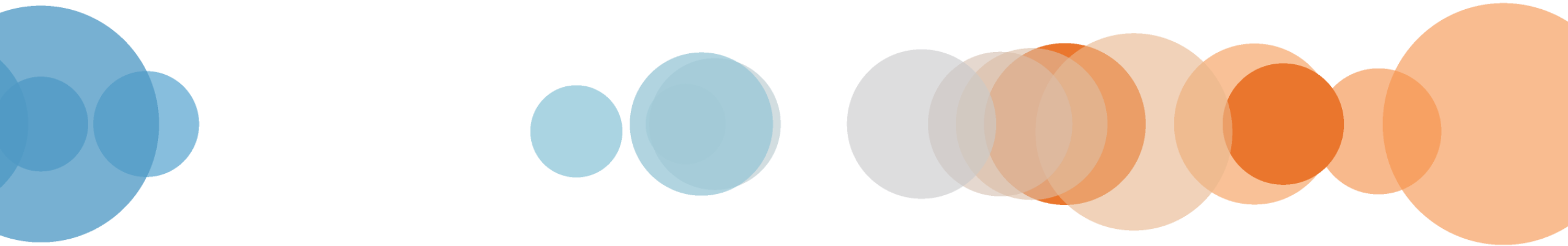
Example Scope and KPI Categories

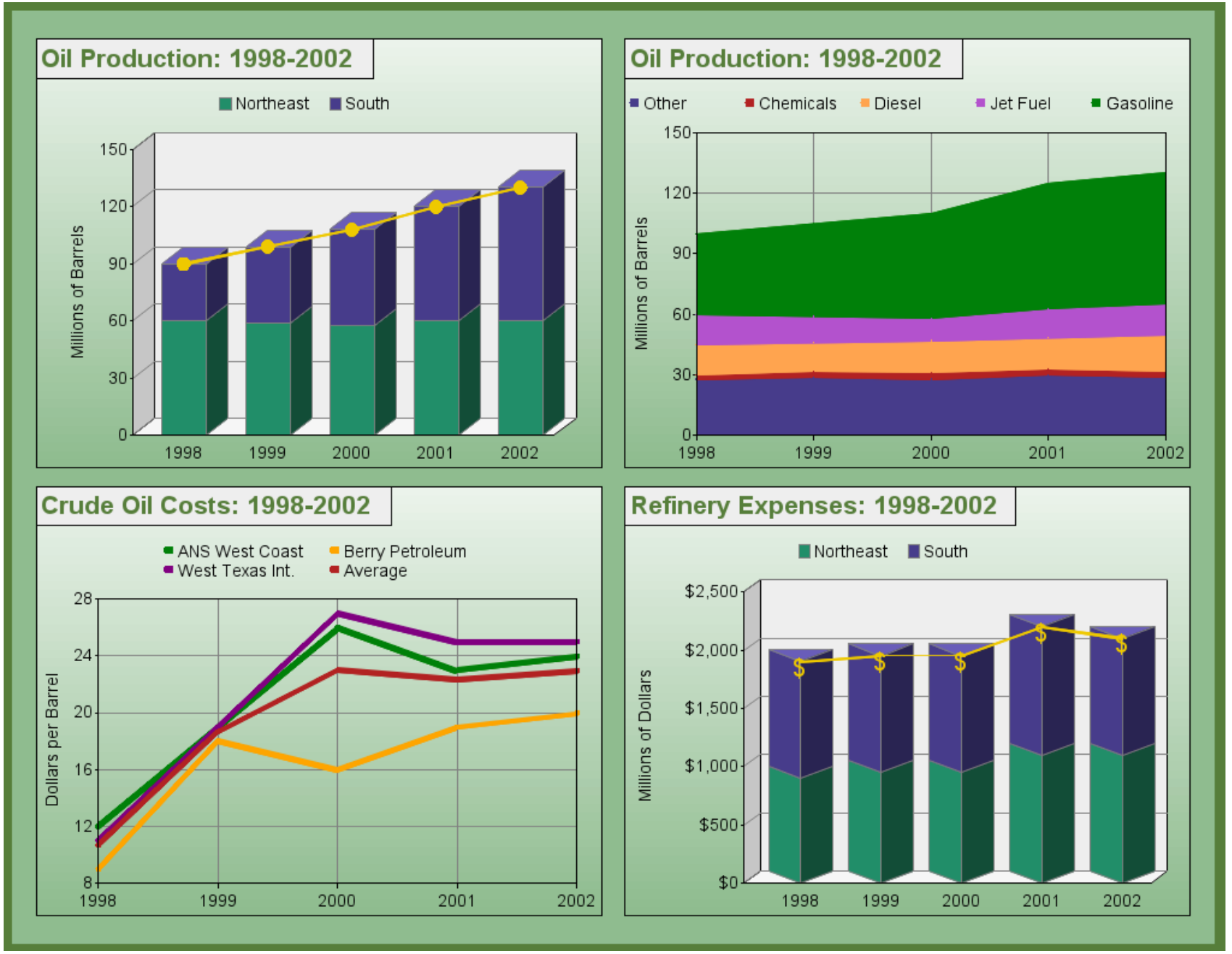


Many KPI categories:

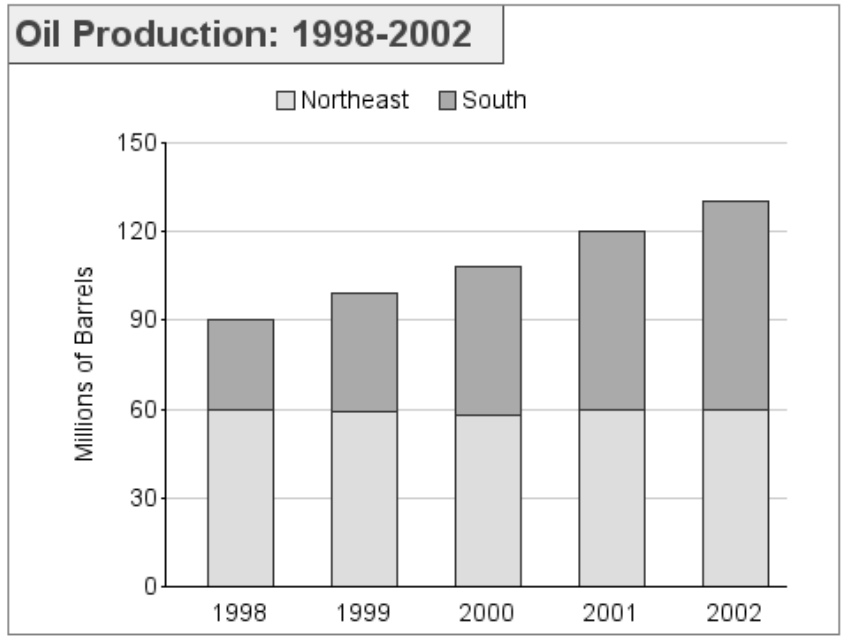
- Industry Benchmarks
- Cash Flow
- Risk and Security
- Customer Satisfaction
- Asset Management
- HR
- Information Quality

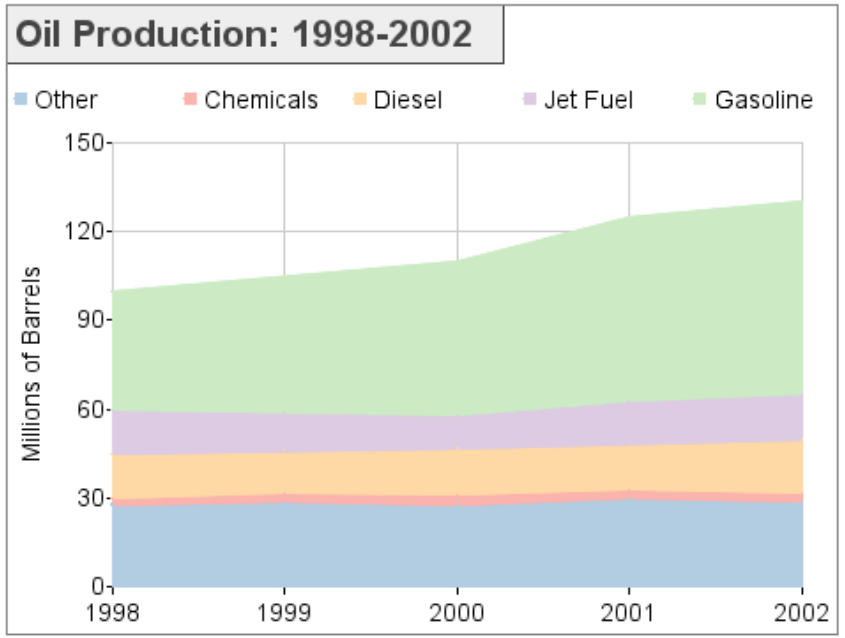
Compare and Contrast

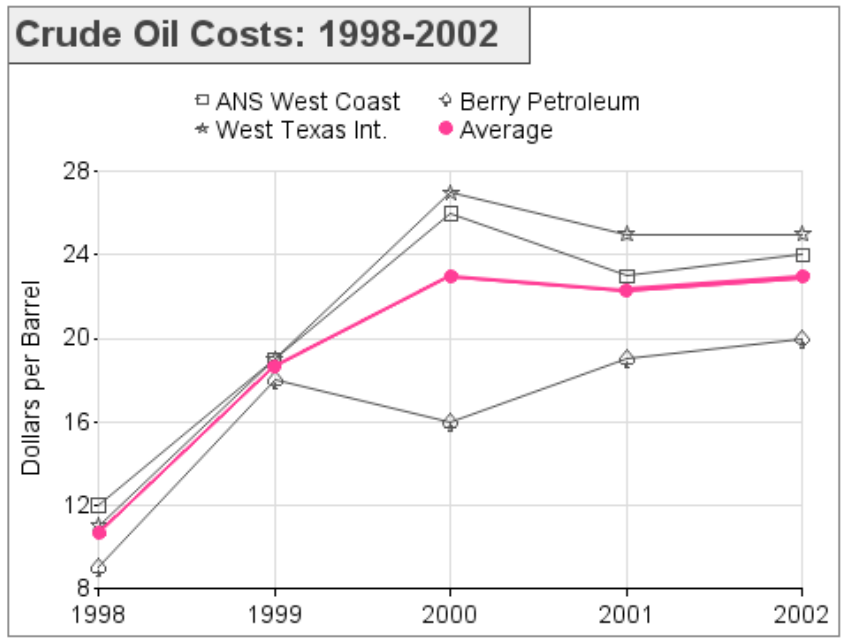


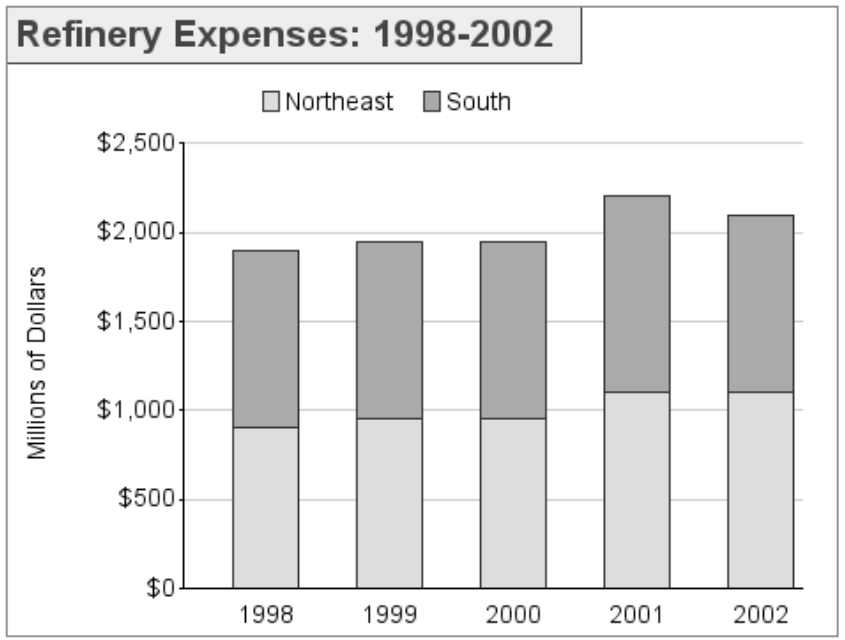


Source: “blinged dashboard” from http://robslink.com/SAS/democd36/oil_blinged.htm



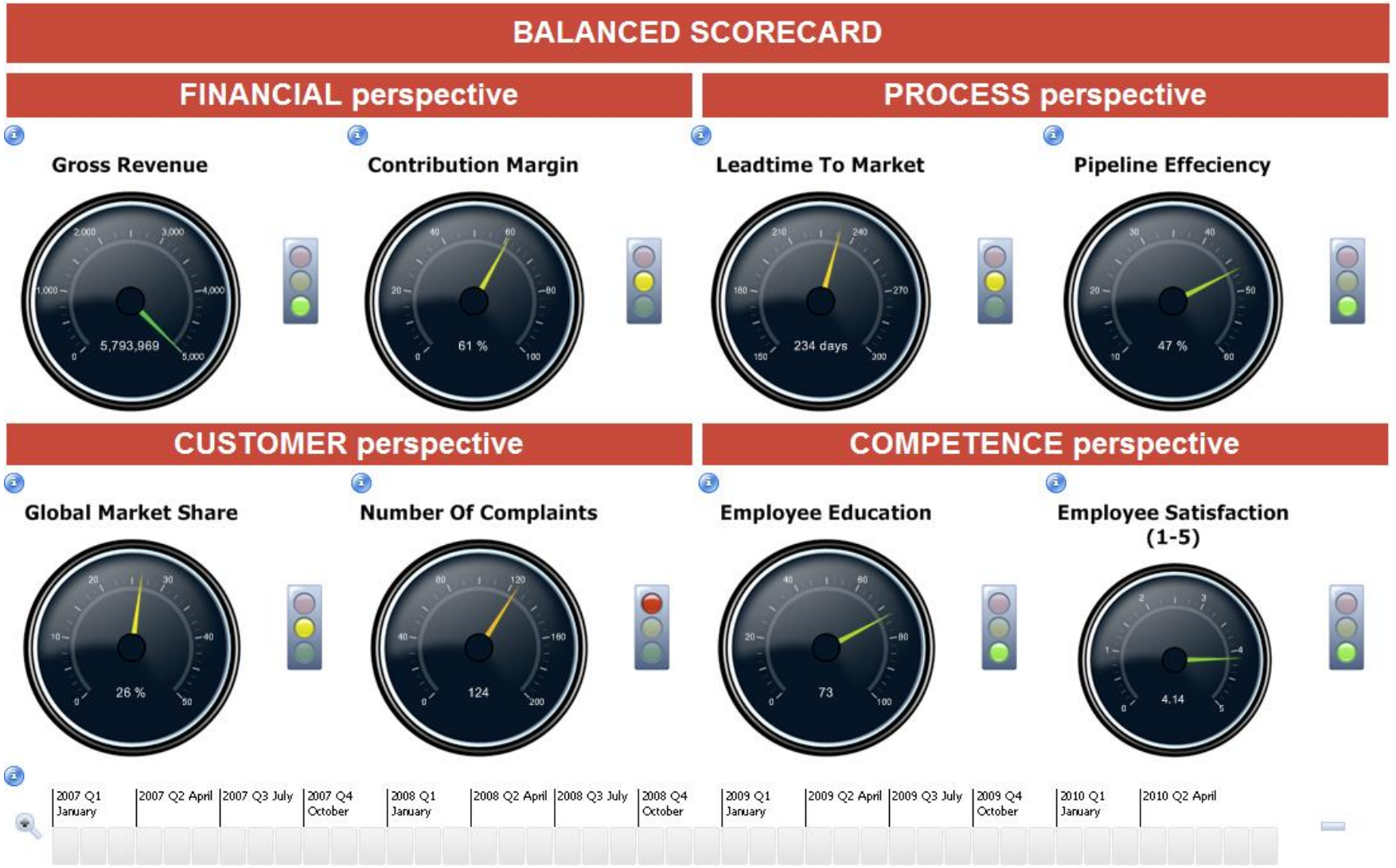






Source: “unblinged dashboard” from http://robslink.com/SAS/democd36/oil_unblinged.htm

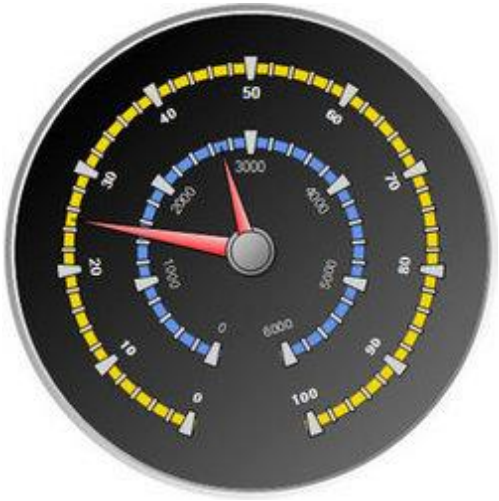
Dashboard – Low Effectiveness



Source: Targit BI Balanced Scorecard from https://www.youtube.com/watch?v=4vuoQgYPdAw

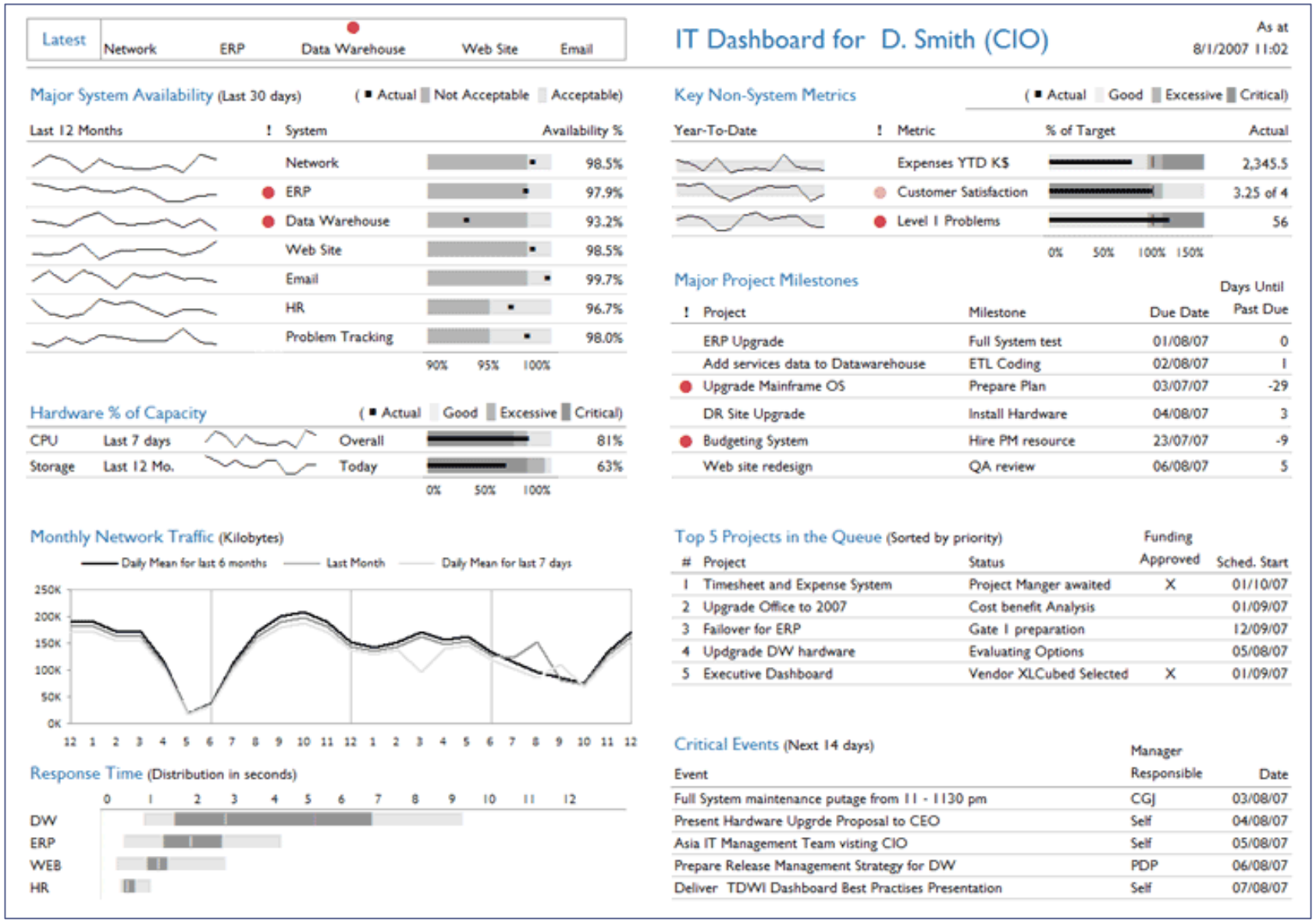
Avoid Useless Bling

- Some of the widgets and displays provided by tool vendors are glitzy but unhelpful – like these:



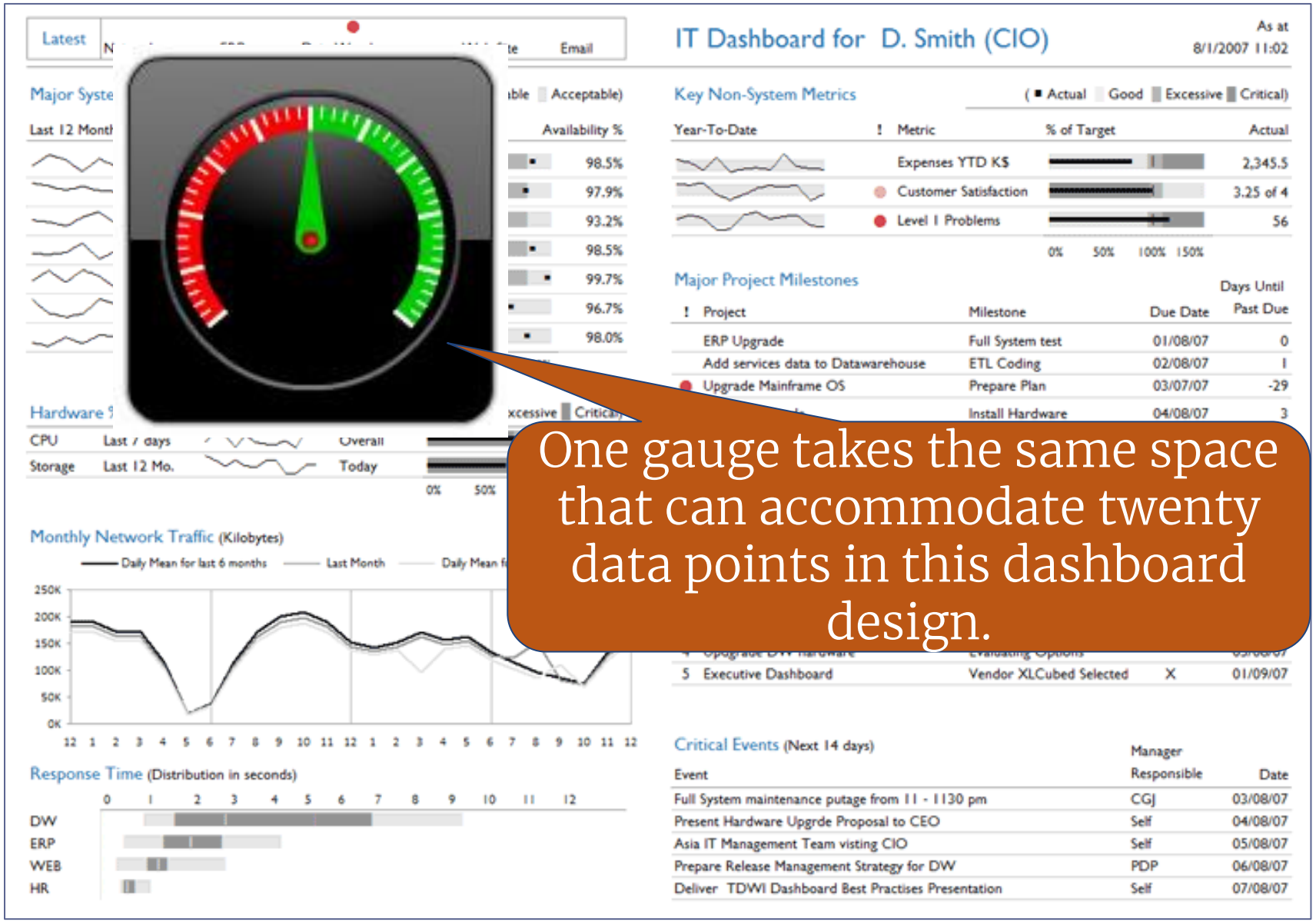
- Require a disproportionate amount of room for the information presented
- Hard to read and understand
- Little actionable information

Dashboard – High Effectiveness



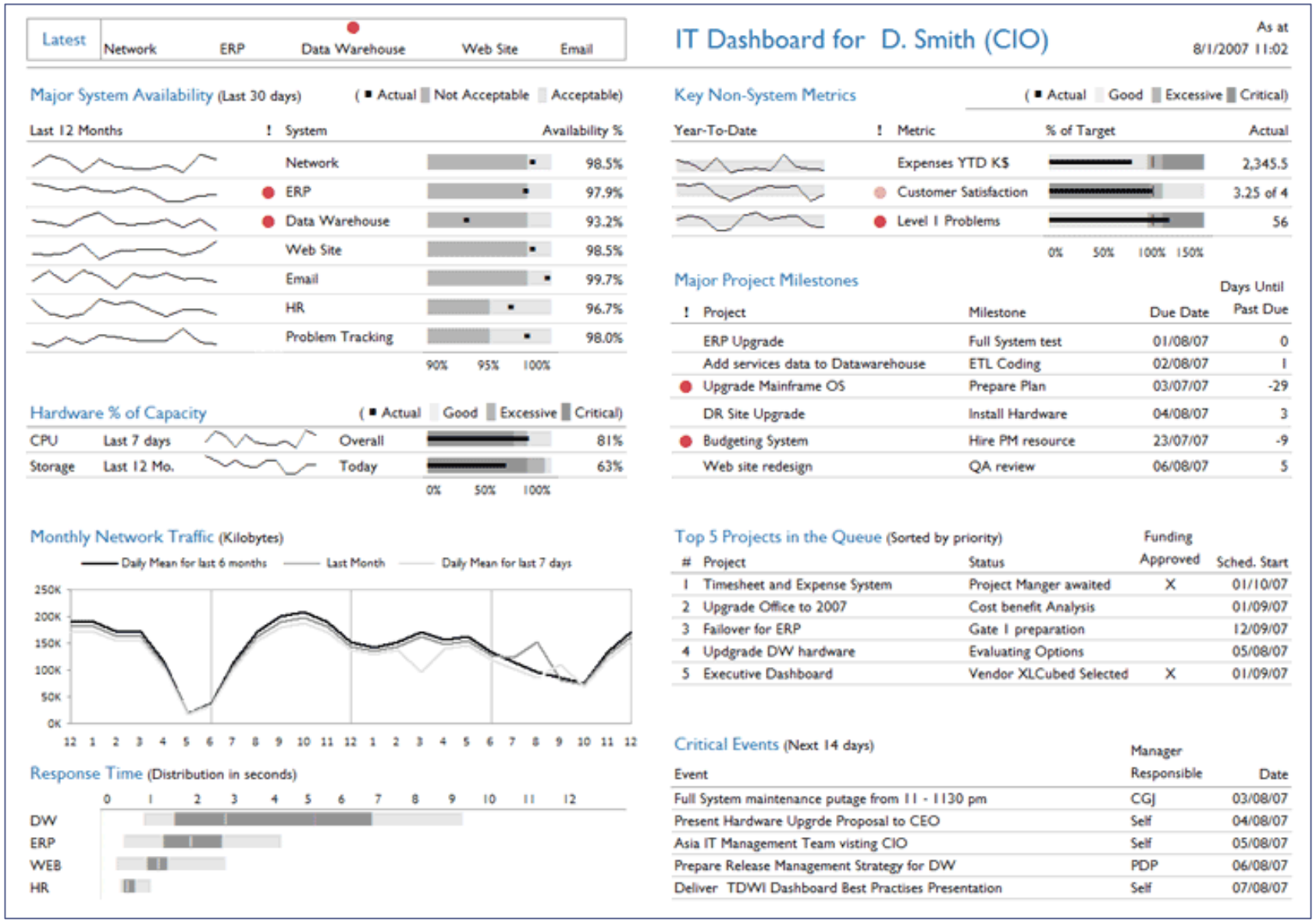
Source: *Information Dashboard* Design by Stephen Few

CIO Dashboard



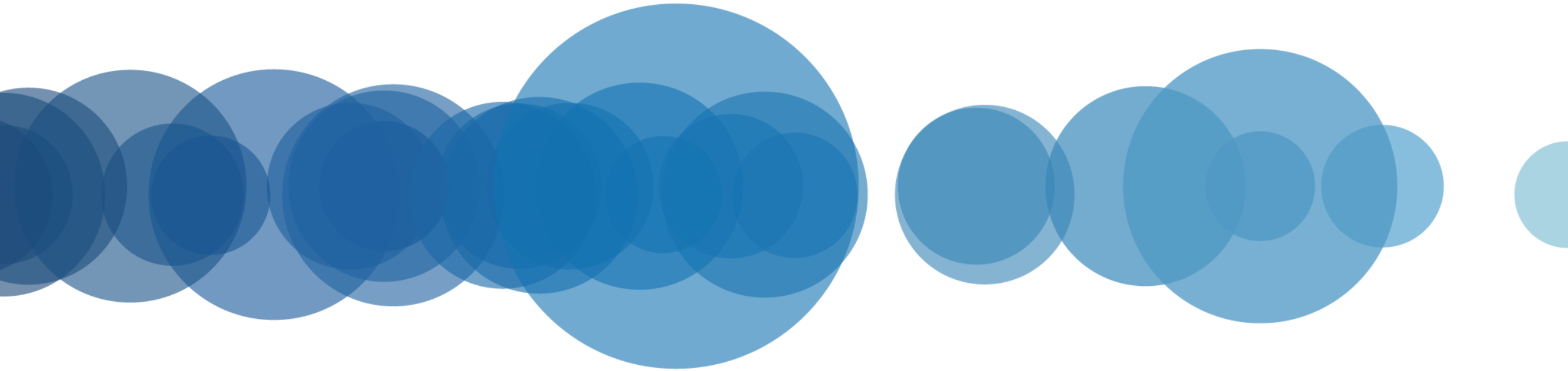
Source: *Information Dashboard* Design by Stephen Few

Dashboard – High Effectiveness



Source: *Information Dashboard* Design by Stephen Few

Layout Basics



Eye Scanning Patterns (Web)

Red indicates more visual attention on that portion of the page

Source: http://styleguide.yahoo.com/writing/write-web/eye-tracking-where-do-readers-look-first

Eye Scanning Patterns (Web)

www.useit.com

This "F" pattern is widely cited on the web
but is partially a product of text-heavy pages.

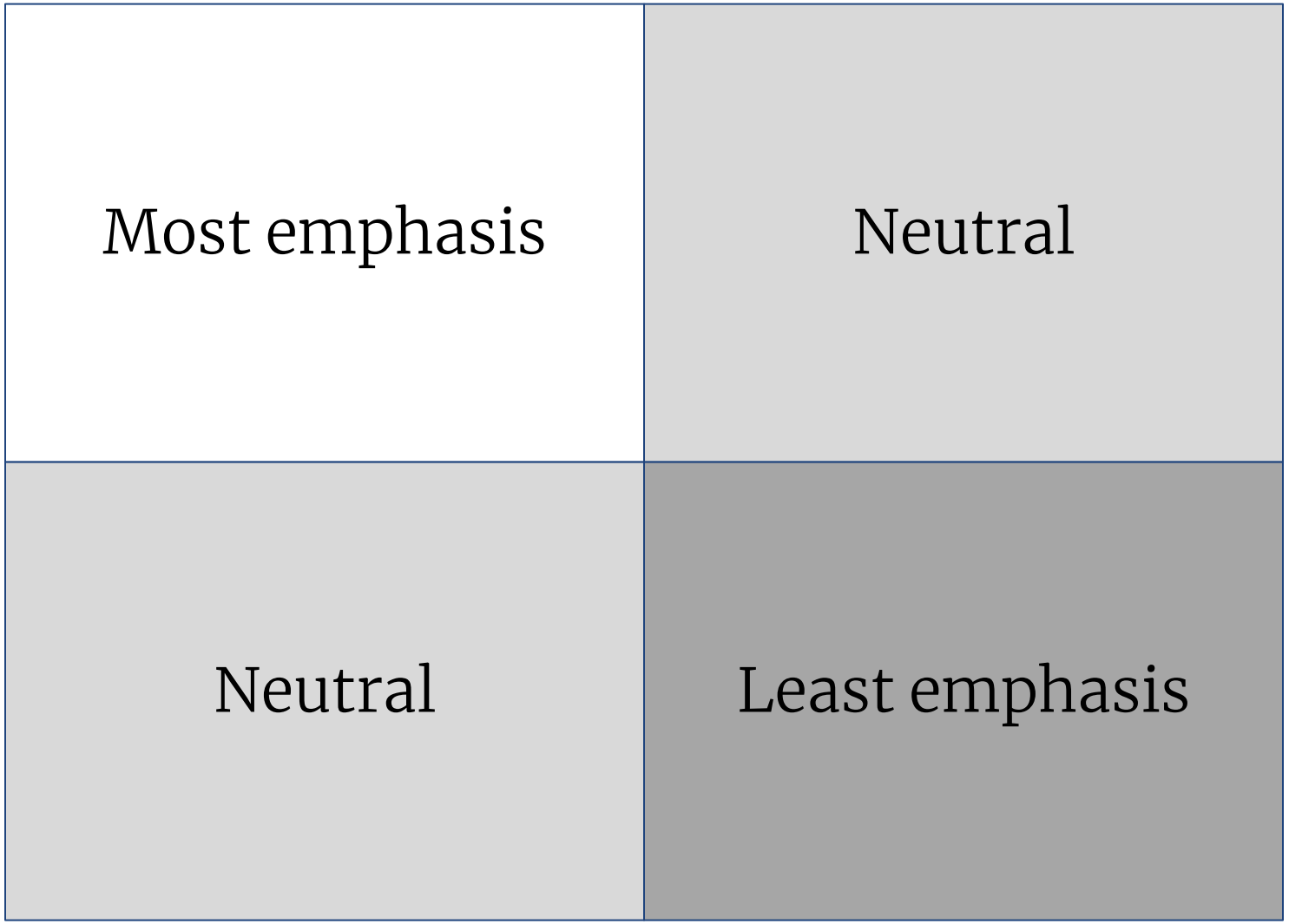
Source: http://www.useit.com/alertbox/reading_pattern.html

Patterns are affected by content…

…as well as the form of media being read.

Source:
http://www.humlab.lu.se/resources/publications/studentpapers/Holmberg_04

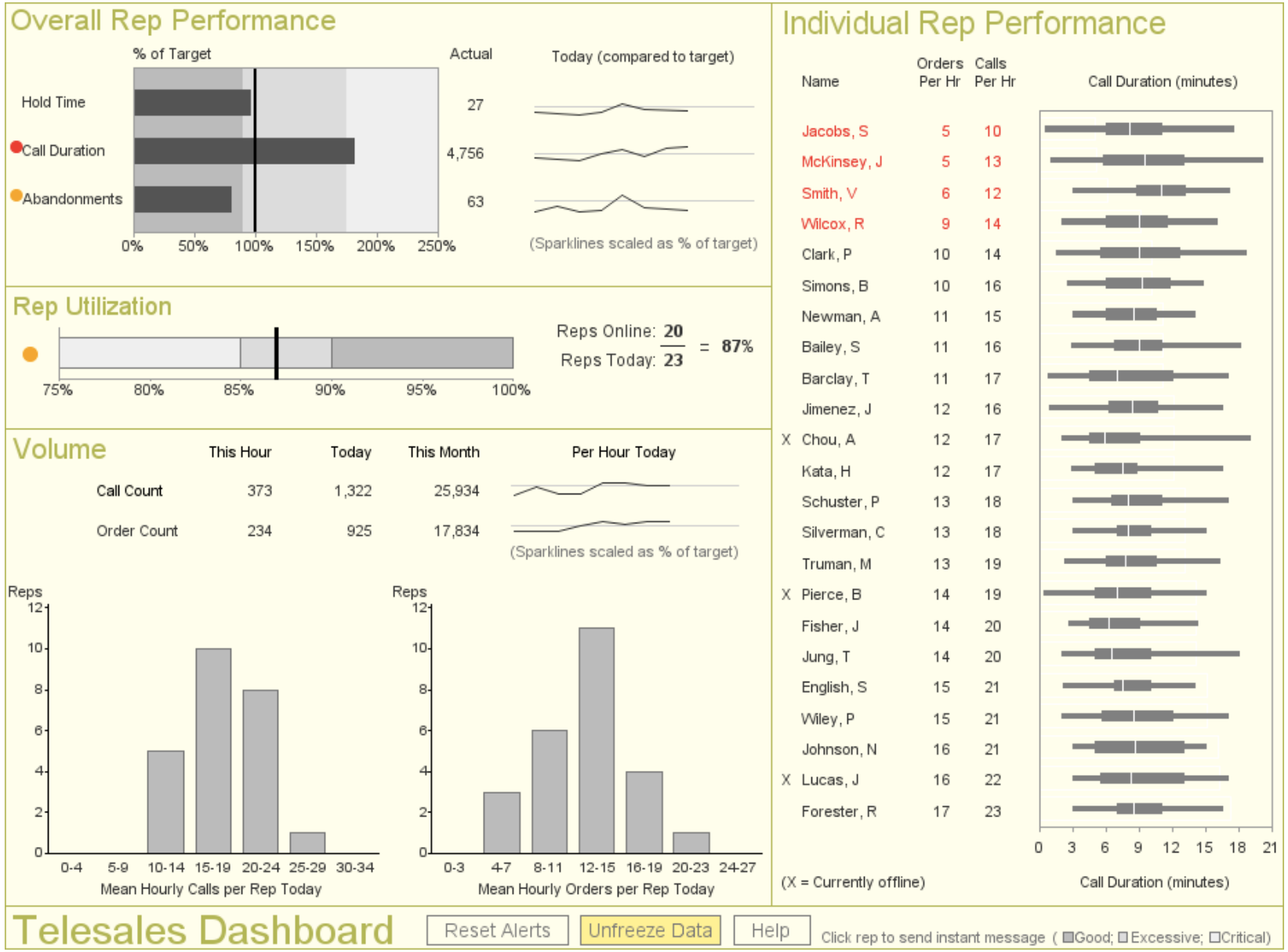
Emphasis Guidelines for Dashboards



Dominance of the neutral quadrants may change based on content.

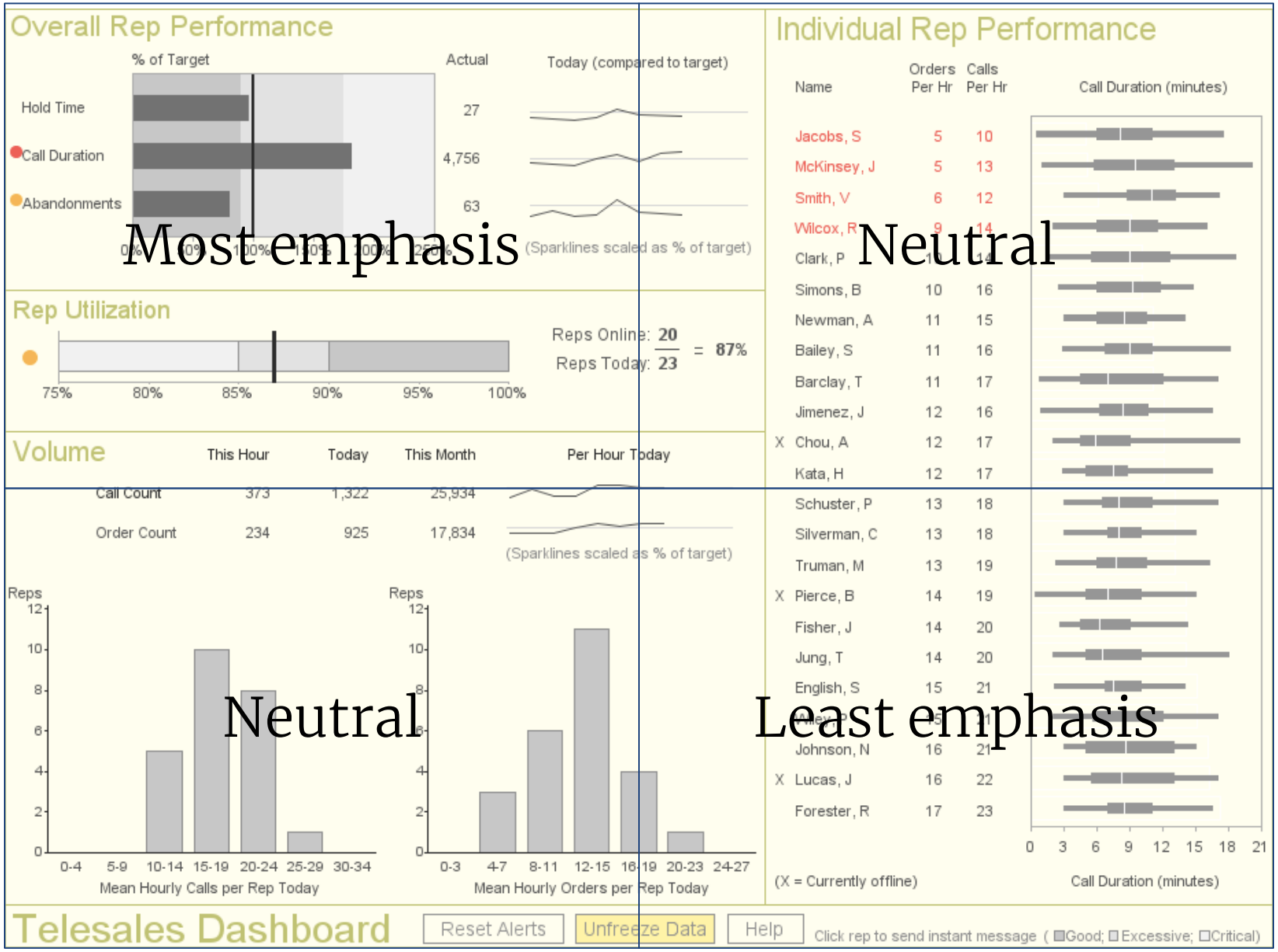
Source: http://www.useit.com/alertbox/reading_pattern.html

Sales Team Dashboard



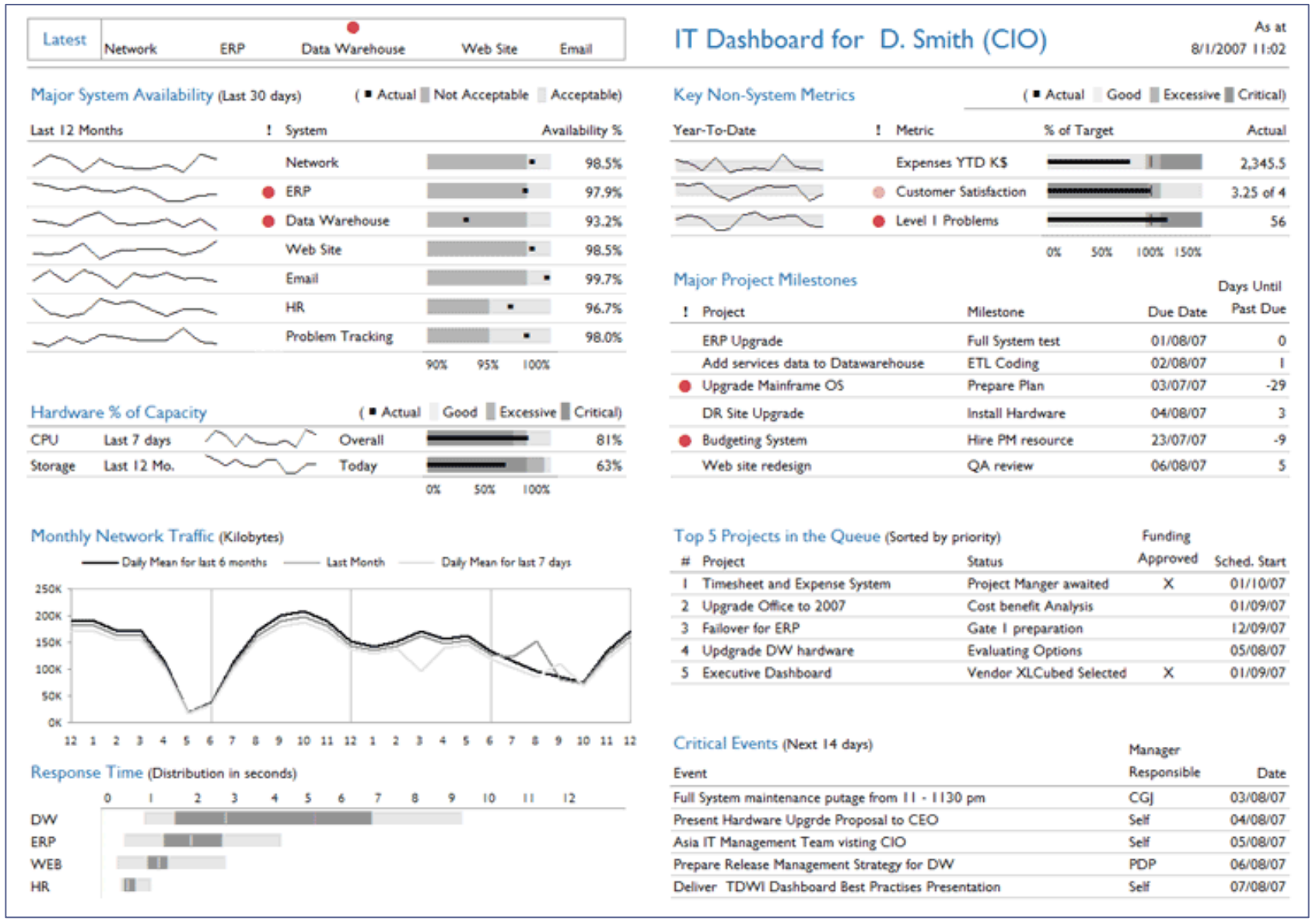
Source: *Information Dashboard* Design by Stephen Few

Sales Team Dashboard



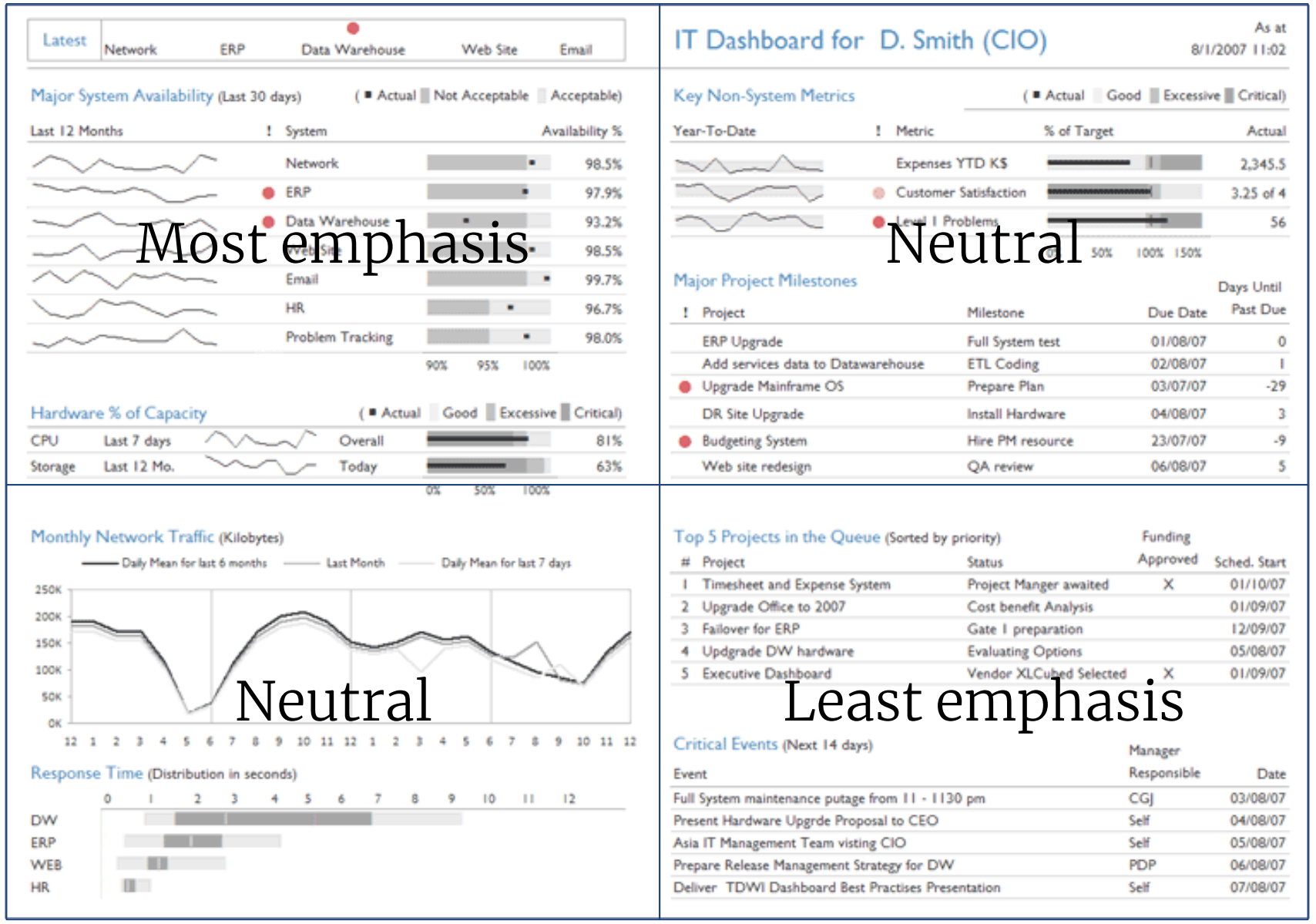
Source: *Information Dashboard* Design by Stephen Few

CIO Dashboard



Source: *Information Dashboard* Design by Stephen Few

CIO Dashboard



Source: *Information Dashboard* Design by Stephen Few

Website Analytics

All data from August 1, 2015 through July 15, 2016

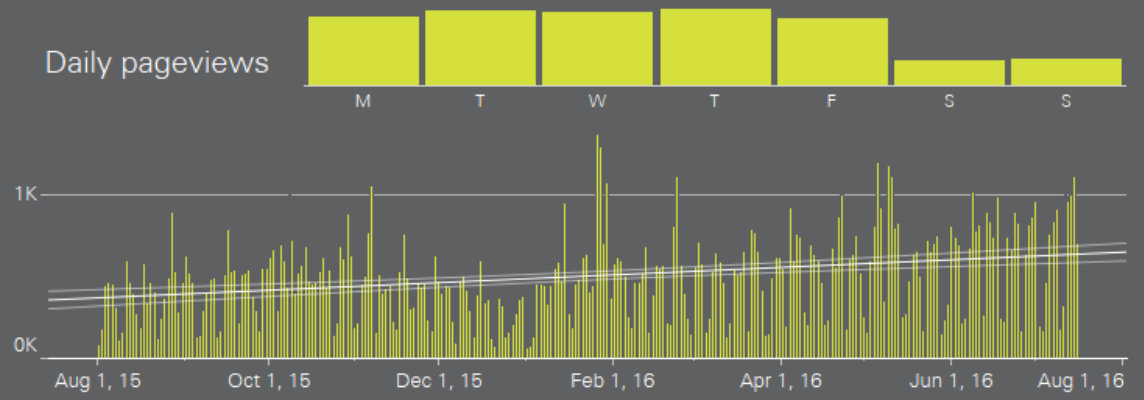
data + science
= transforming data to insight

DATAPLUSSCIENCE.COM

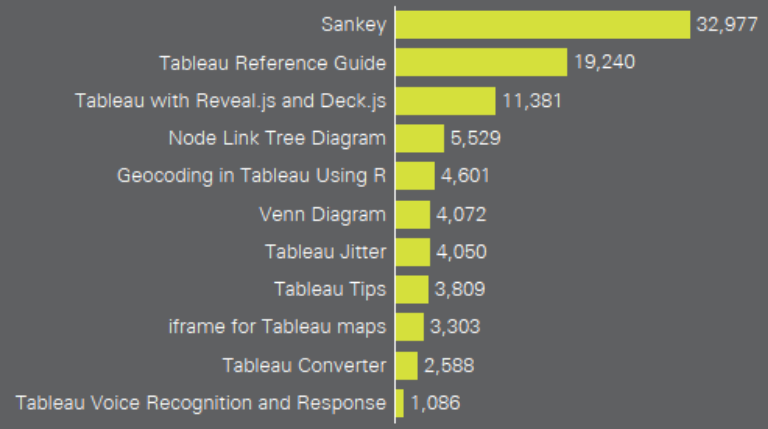
174,828
pageviews

81,938
users

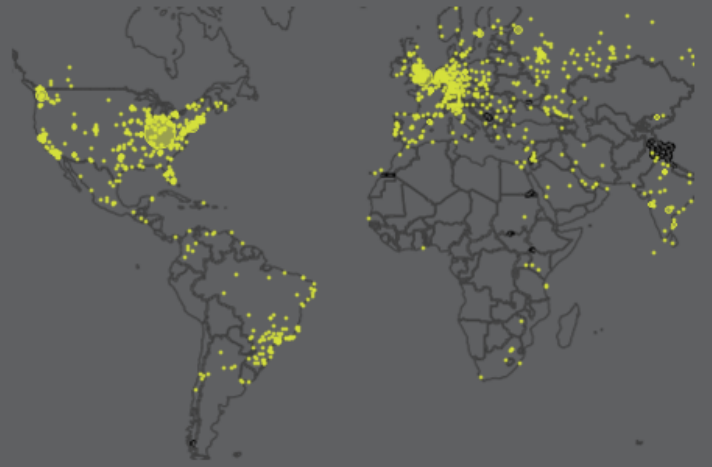
32
blog posts



Most Visited Topics (pageviews)

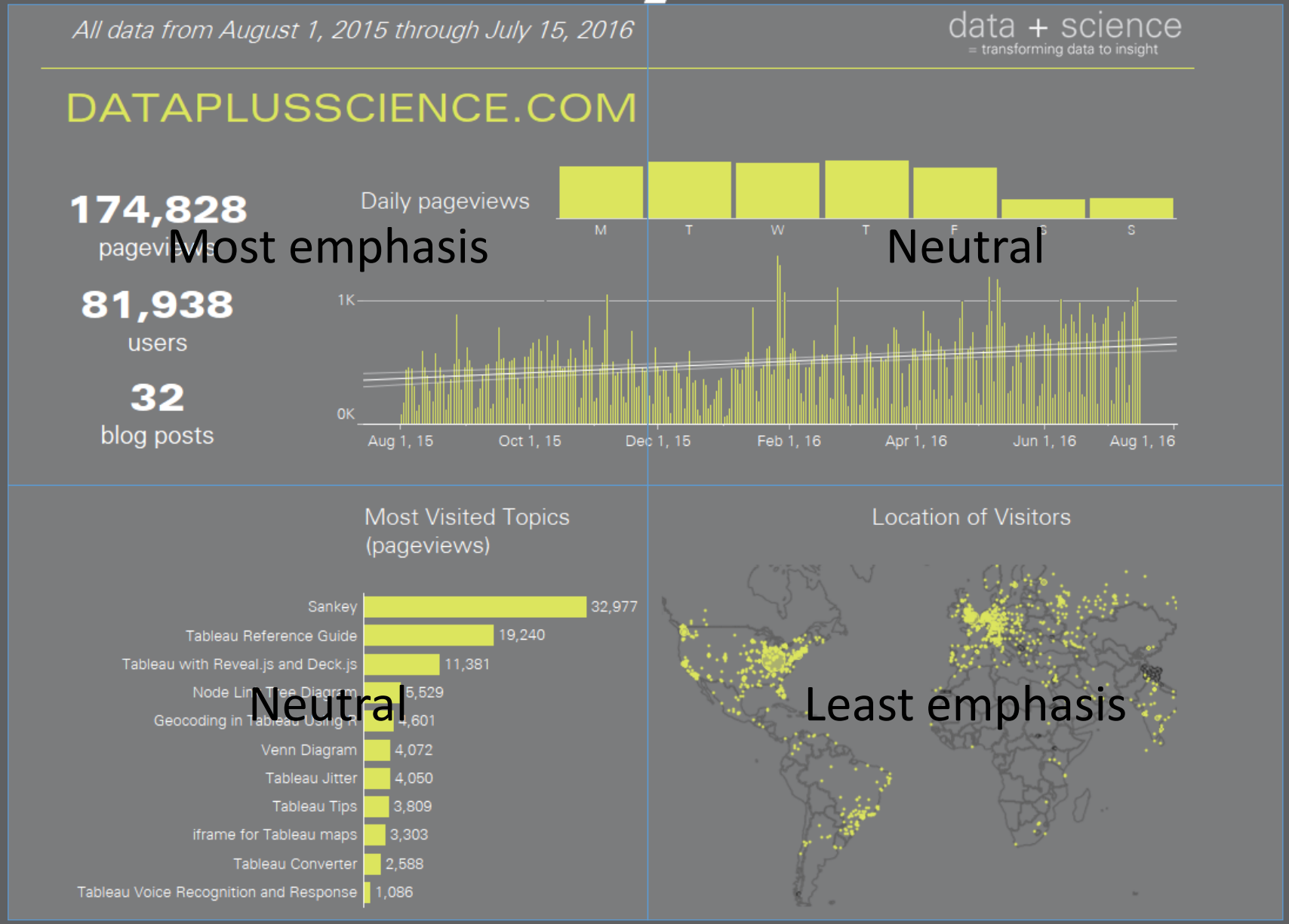


Location of Visitors



Source: *The Big Book of Dashboards* (BigBookofDashboards.com)

Website Analytics



Source: *The Big Book of Dashboards* (BigBookofDashboards.com)

Complaints Dashboard

Date Received
1/1/2015 — 3/18/2016

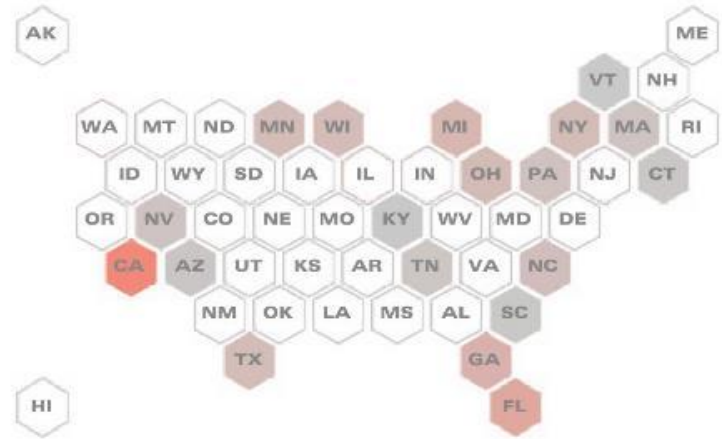
Source Type: All

Show Open/Closed: All

Total Complaints:	Closed	Open	Total
	288	39	327

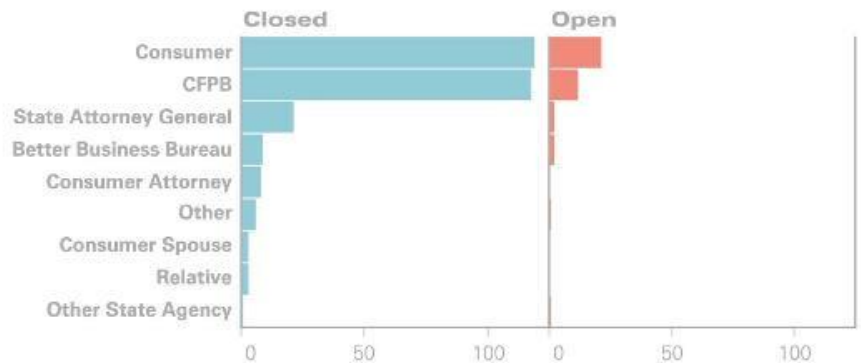
Complaints by Month

Open Complaints by State *(click to filter)*



Complaints by Reason

Complaints by Party *(click to filter)*



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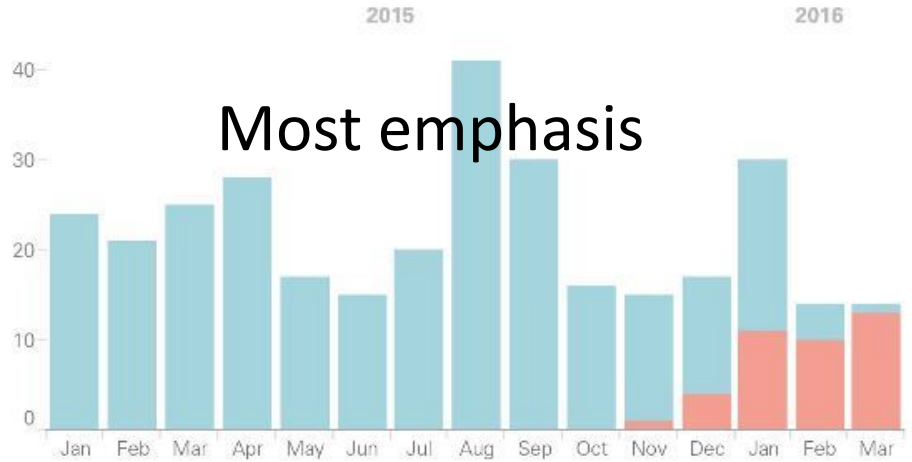
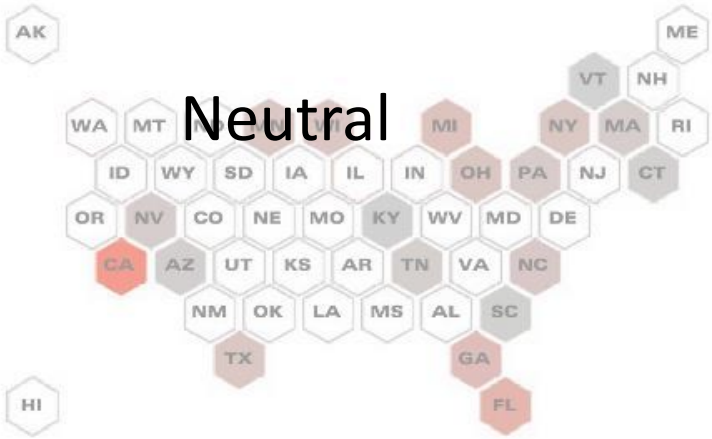


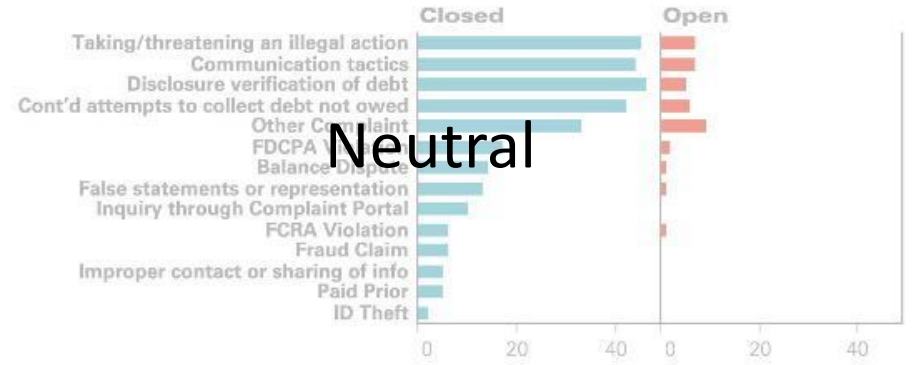
Most emphasis

Open Complaints by State *(click to filter)*



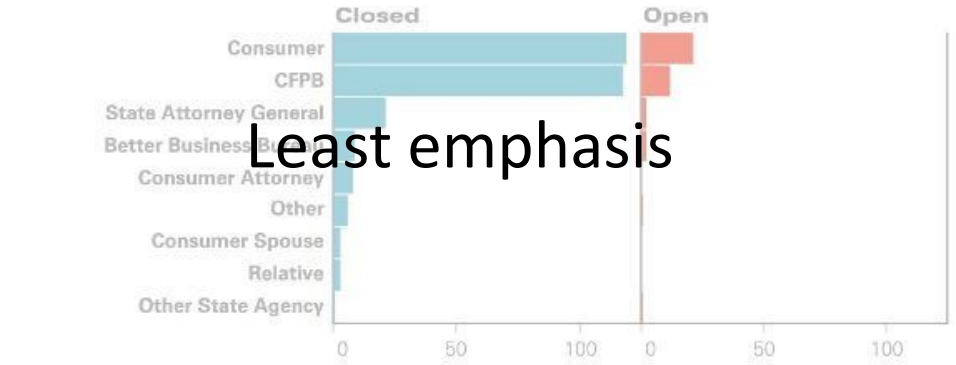
Neutral

Complaints by Reason



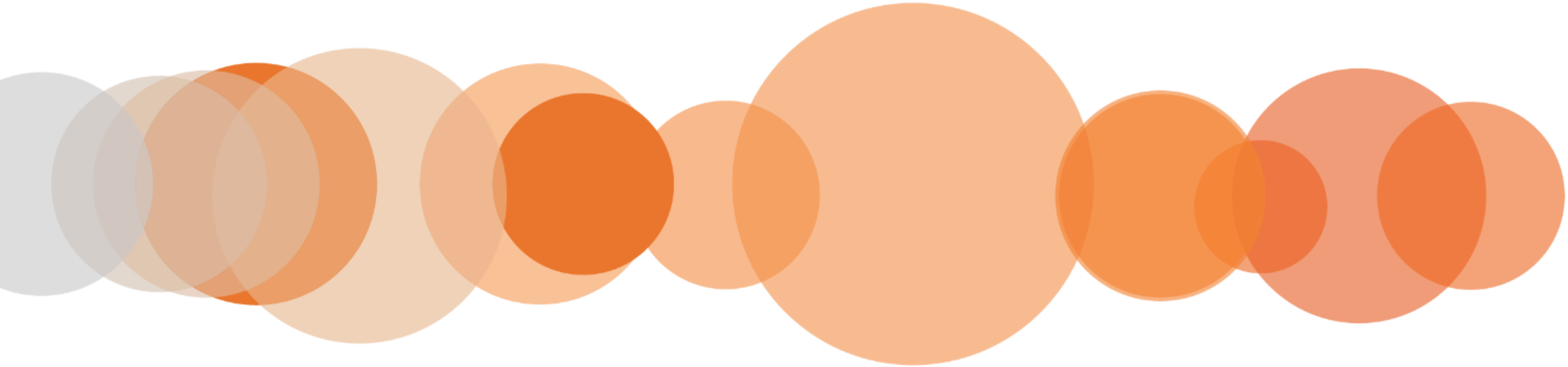
Neutral

Complaints by Party *(click to filter)*

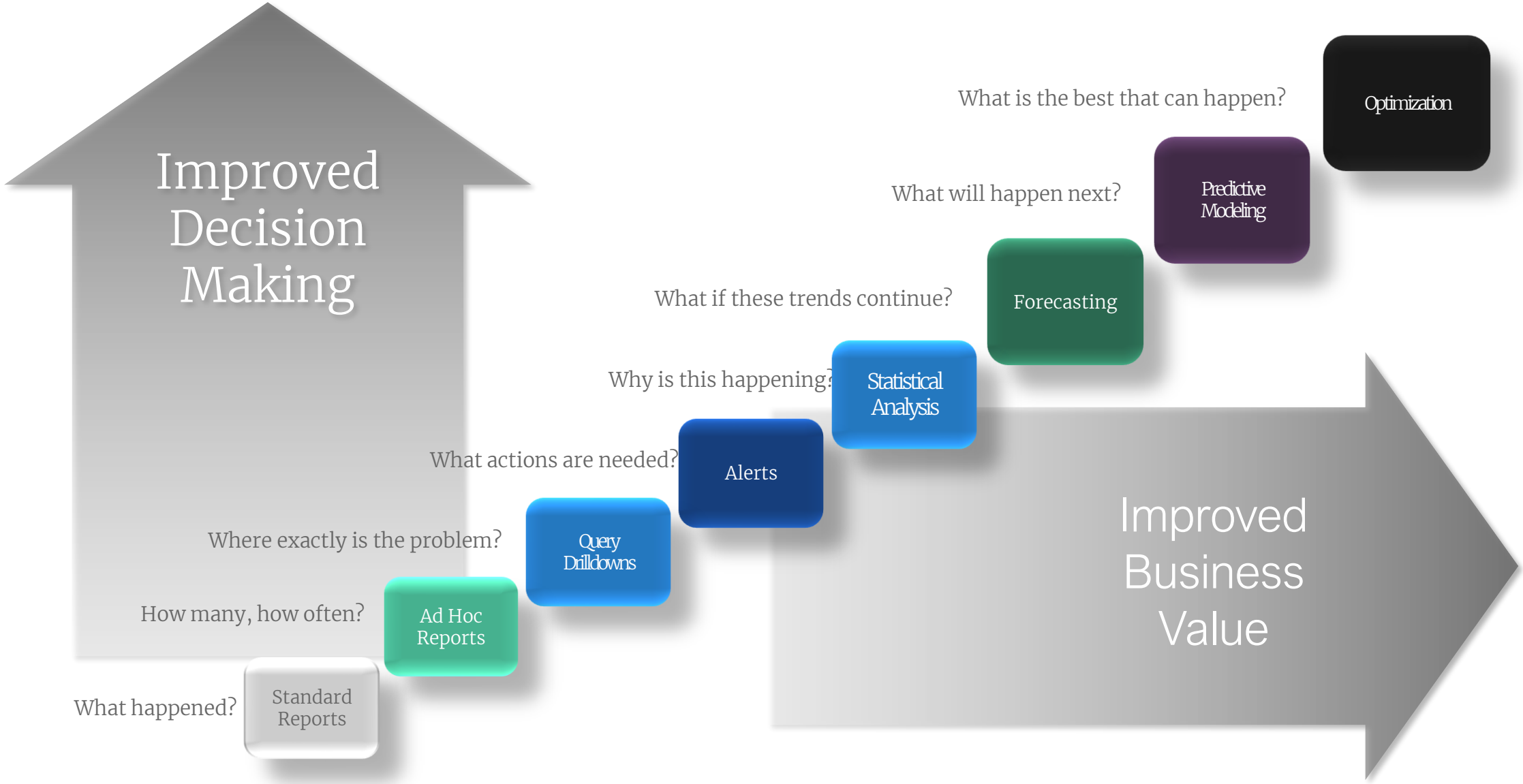


Least emphasis

What Makes Visualization Actionable?



Questions and Analytics Maturity



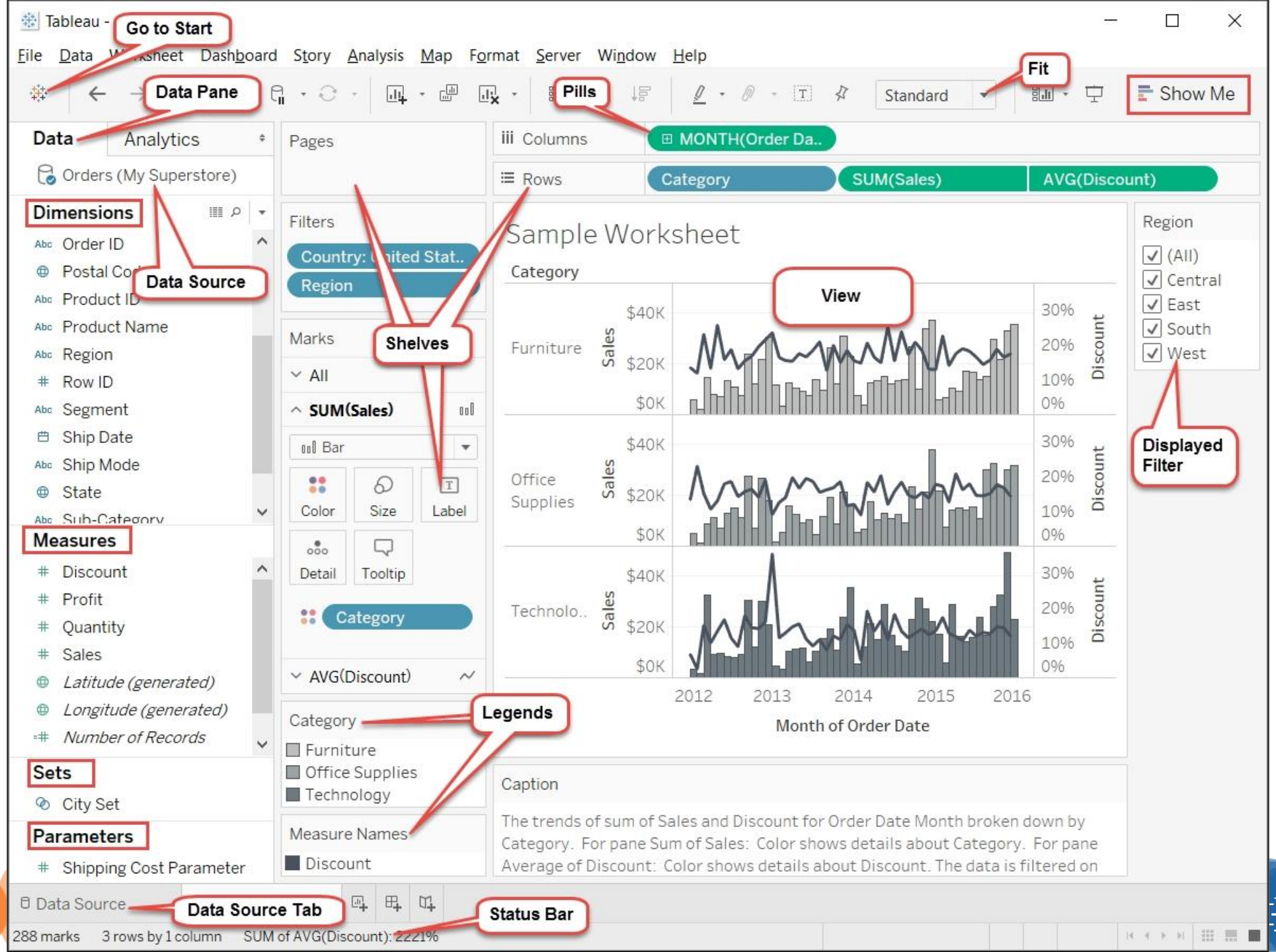
Source: LÛCRUM Incorporated.

Key Performance Indicators (KPIs)

A KPI is a type of performance measurement, used to evaluate success or achievement against a specific goal

- Can be operational or strategic
- Help to identify areas that need attention
  - More "where to look" vs. "this happened"
- Knowledge of "what matters" to an organization makes KPIs relevant
- Often included in dashboard displays

You must know what you're measuring and what performance is desired before you create a KPI.



Source: oreilly

Summary