Dashboards

What do we talk about when we talk about dashboards?

(Alper Sarikaya, Michael Correll, Lyn Bartram, Melanie Tory, and Danyel Fisher)

Ashwin Malshe

Dashboards don’t have a unique definition

“The term dashboard is widely used to refer to many different sorts of entities, challenging the dashboard stereotype familiar to the visualization community.”

Sarikaya, et al.

“A predominantly visual information display that people use to rapidly monitor current conditions that require a timely response to fulfill a specific role.”

Few

“A visual display of data used to monitor conditions and/or facilitate understanding”

Wexler et al.

Two Genres of Dashboards

- Visual: a visual data representation structured as a tiled layout of simple charts and/or large numbers
  - **Appropriate for data storytelling**
- Functional: an interactive display that enables real-time monitoring of dynamically updating data

Distinguishing Factors

Purpose

- Decision support
    - Strategic, tactical, or operational
- Communication and learning

Social media operational decision-making dashboard

https://malshe.shinyapps.io/twitter-analysis-b2b/

COLLABORATIVE FOR CUBES™
Customer-Based Execution & Strategy

Select a Twitter Handle

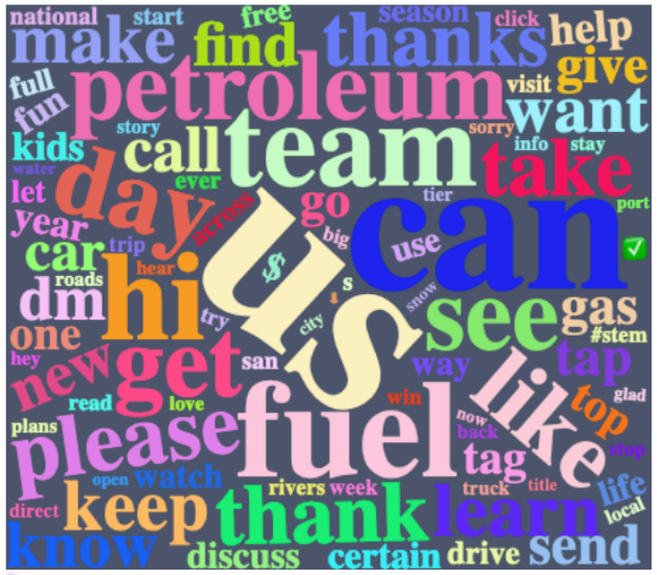
Valero Energy

Select Number of Words

What is a Wordcloud?

READ ME!

Before Covid for Valero Energy

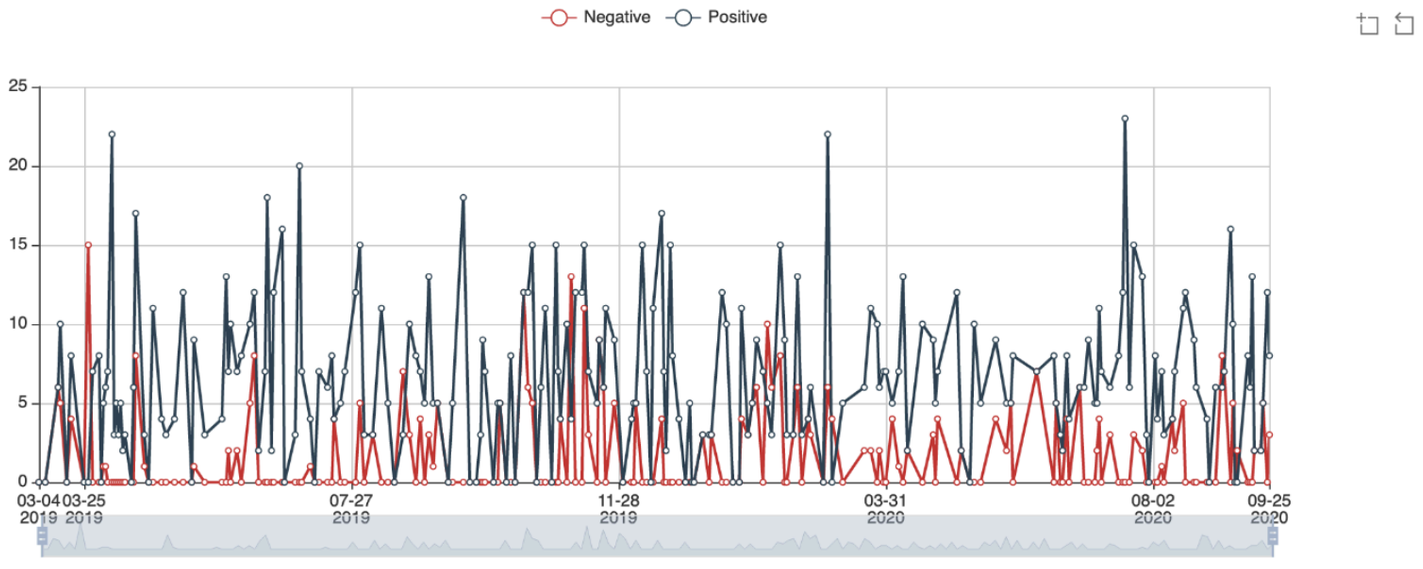


During Covid for Valero Energy

Select One or More Sentiments

- Negative
- Positive
- Anger
- Anticipation
- Disgust
- Fear
- Joy
- Sadness
- Surprise
- Trust

Sentiment Across Time for Valero Energy

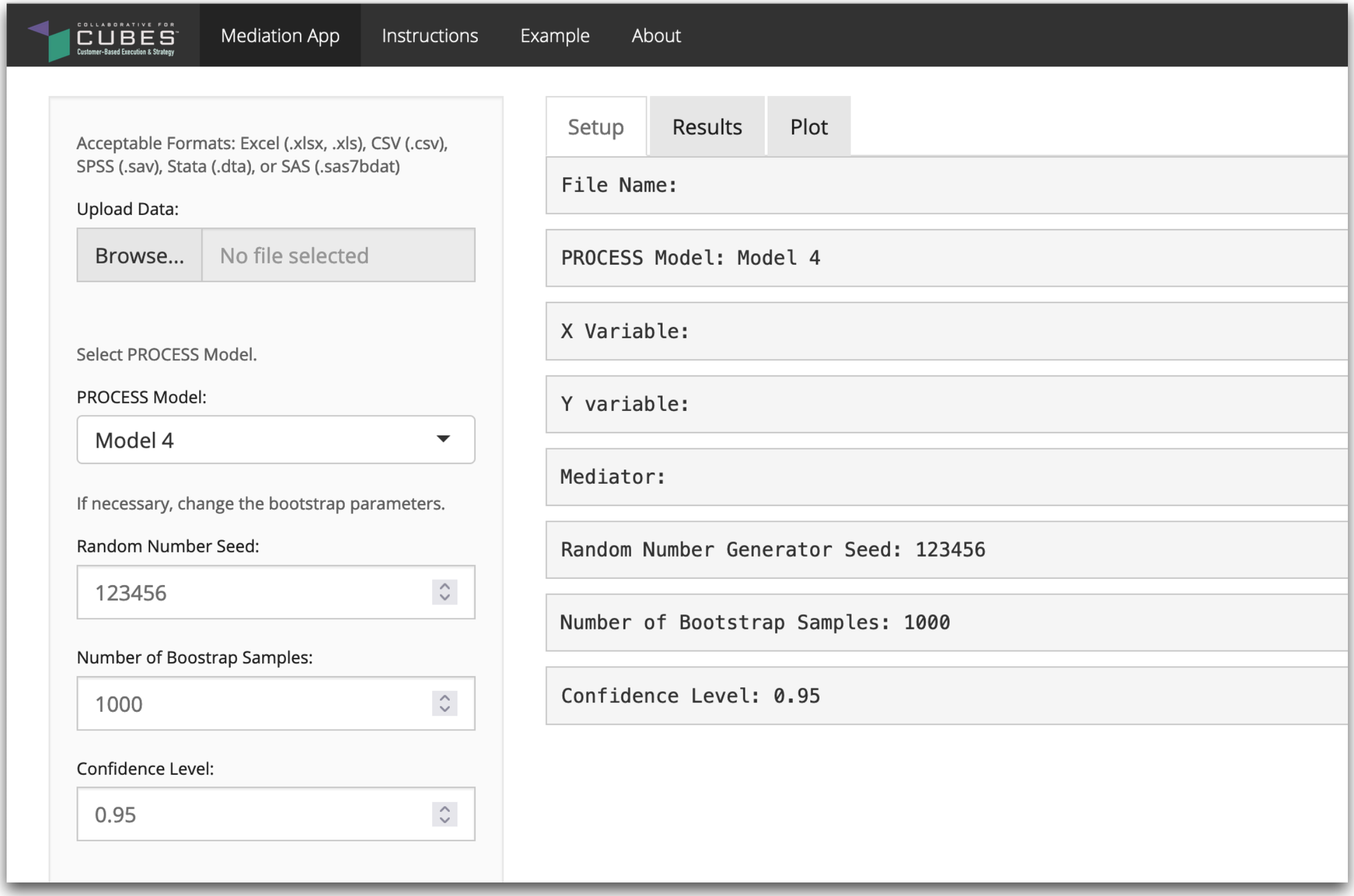


Audience

- Circulation
    - Public, Social, Organizational, Individual
- Required visualization literacy
    - Low, Medium, High
- Requires advanced domain expertise

Dashboard requiring advanced domain knowledge

https://malshe.shinyapps.io/twitter-analysis-b2b/



Visual Features & Interactivity

- Construction and composition
    - Flexibility for the viewer to customize elements
- Multipage
    - Tableau storyboards
- Interactive interface
- Highlighting and annotating
- Modify data or the world

Additional Data Semantics

- Alerting + notifications
- Benchmarks
- Updatable

The dominant characteristics observed for each cluster of coded dashboards

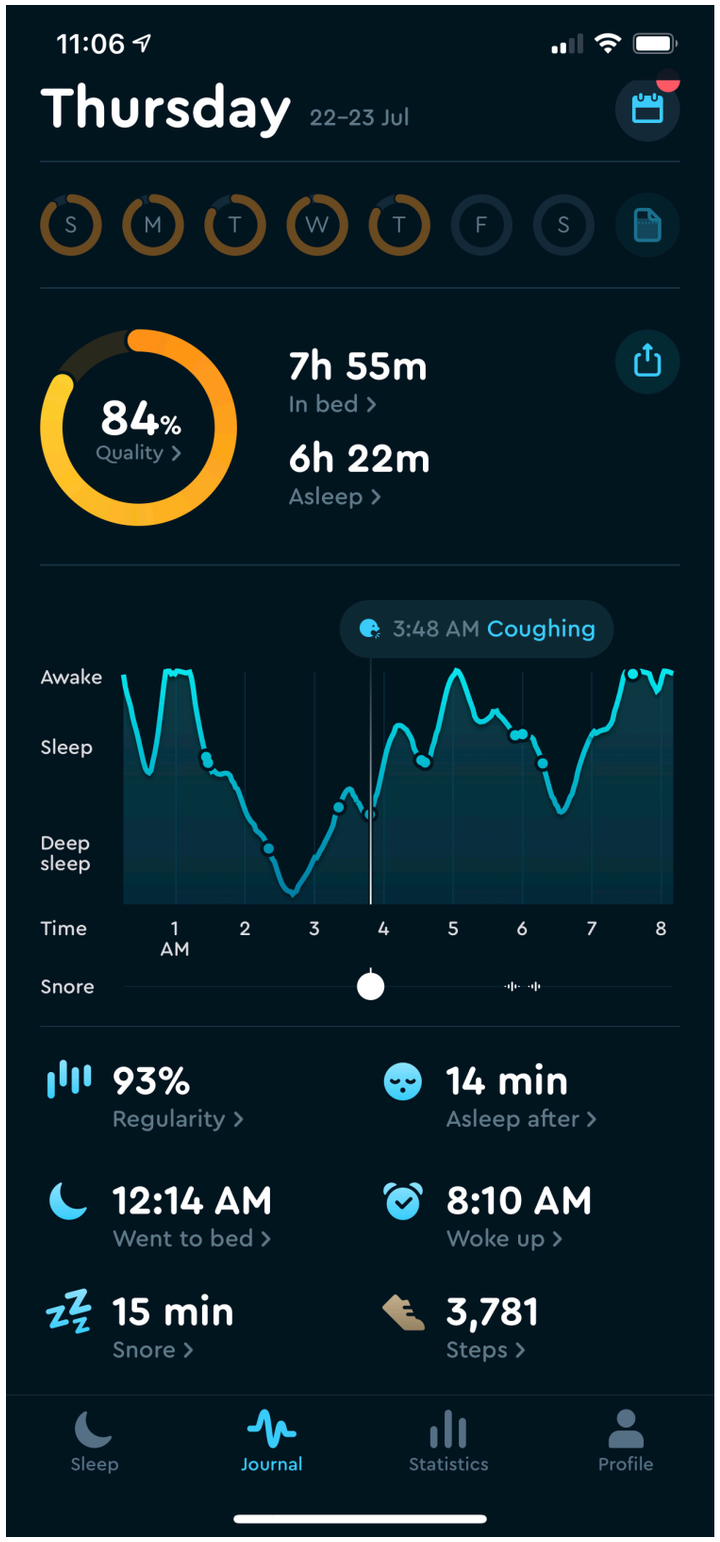
Table 1 on Page 5

				Purpose				Audience				Visual Features						Data Semantics		
Goal	Cluster		# Examples	Strategic	Tactical	Operational	Learning	Audience	Vis Literacy	Domain Expertise	Construction	Interactivity	Modify Data/World	Highlighting	Multipage	Alerting+Notification	Benchmarks	Updateable
Decision-Making	1	Strategic Decision-Making	16	Y	Y	-	N	O	-	-	-	Y	N	N	Y	-	-	Y
	5	Operational Decision-Making	14	N	Y	Y	N	O	-	-	-	Y	N	N	Y	-	Y	Y
Awareness	3	Static Operational	10	N	N	Y	N	O	L	-	-	-	N	N	N	-	Y	Y
	4	Static Organizational	8	-	-	N	N	O	M	-	N	N	N	-	N	N	-	Y
Motivation and Learning	2	Quantified Self	7	N	N	Y	N	I	H	N	N	Y	N	-	Y	-	-	Y
	6	Communication	13	-	-	-	Y	P	M	N	N	-	N	-	-	N	N	Y
	7	Dashboards Evolved	15	-	-	-	-	P	H	-	-	-	-	-	-	-	-	Y

Table 1: The dominant characteristics observed for each cluster of coded dashboards. A factor is considered dominant if it occurs at least 50% over the prior probability, otherwise it is marked with a dash (-). **Y** indicates present or supported, **N** entails the opposite. **P** identifies the general public, **O** represents organizational audiences, while **I** indicates dashboards designed for individual consumption. **L**, **M**, and **H** indicate low, medium, and high visualization literacy required to understand the dashboard, respectively.

Familiar Challenges

- End-user flexibility
    - Prediction and prescription (what to do?)
    - Storytelling
- Visual, Analytic, and Data Literacy
    - “If designed properly, tactical dashboards can meet the needs of both casual and power users. The key is to... support the information needs of power users and then turn off functionality as needed to avoid overwhelming casual users with too many bells and whistles or pathways to explore.”



Sleep Cycle app

New Challenges

- Data design
    - Metrics, impoverished data vocabulary, adaptivity, and communicating metadata
- Social impact
    - “Visual expression of the KPI mindset”
    - Social comparison
    - Sharing, security, trust, and privacy

The End