Dashboard Renaissance

Clever Subtitle Here

Hello, I'm Cory

- Technical Evangelist @ Splunk
- previously:
 - Director, Office of the CTO @ SignalFx
 - Principal Engineer, Stripe
 - SRE & Engineering Manager, Twitter
- observability wonk

Goal: Improve dashboards

- Humans are what matter
- Often the "UI" for our work as operators
- We're **not** trained to do this
- Impacts on employees and customers
- Cognitive resources are shared

"Mistakes often arise from ambiguous or unclear information about the current state of the system"

- Don Norman, The Design of Everyday Things

Don Norman's Mistakes

- Mistakes: conscious decision of what to do, gone wrong
- "Poor information provided by the system"
- "Poor-quality feedback about what has actually happened"

Metrics & Layout

Get a spec from users

- Purpose
- Goal
- Familiarity
- Context needed
- Actions

4 Types of Dashboard

- Steady-state
 - latency, errors, txn counts, outcomes
- Long-term
 - planning, scaling, big time windows
- Diagnostic
 - what's broken? blast radius, hypotheses

Debugging

← lots of guessing, disproving, ad hoc

Valuable Metrics

- Understandable
- Comparable (business, time, resource, customers)
- Drives action or change
- Unavailable elsewhere

Starting Concepts

- Use your goals and priorities
- Grids are good



What to include

- RED and USE
- Be choosey
- Prefer symptoms to causes
- Meaningful comparisons



One Screen, More Next Steps

- Colocate common items
- Humans can only keep 3 or 4 visuals in working memory

Overview	HTTP Detai	s	Dependencies	Ne	tworking	Runtime Info
First thing		Co	Compare A		Compare B	
Next logical thing			A		В	

Progressive Depth



Summary: Design It!

- Get spec from users
- Include metrics that meet goals
- Use grid
- Support progression, linking to more things

Visualizations

Hacking Humans

- What can we quickly get information from?
- What is pleasing to the eye?
- How can we increase accuracy?
- Where do we draw attention?

089762345762334379561337509 272345098723409857092384752 136ENGAGE9WITH8MY4BRAND1567



089762345762334379561337509 272345098723409857092384752 136ENGAGE9WITH8MY4BRAND1567







Of

Humans Like Horizons

- Wider than taller
- Time as X axis is intuitive
- Angles of data are better (fewer tall spikes)



Before Lines, Bars, & etc

- Alerts are just charts you care about
- Position and meaning



Don't Forget Tables

- Good for single values
- Well understood, dense

Value 🗡	demo_host	demo_customer	demo_datac	Plot Name	sf_metric
205.47ms	server2	zibobodesign.net	Paris	Operation Duration	demo.trans.latency
205.13ms	server2	thefountain.org	Paris	Operation Duration	demo.trans.latency
204.38ms	server3	thefountain.org	Paris	Operation Duration	demo.trans.latency
204.37ms	server4	thefountain.org	Tokyo	Operation Duration	demo.trans.latency
204.26ms	server4	zibobodesign.net	Tokyo	Operation Duration	demo.trans.latency
204.19ms	server3	zibobodesign.net	Paris	Operation Duration	demo.trans.latency
203.34ms	server6	zibobodesign.net	Tokyo	Operation Duration	demo.trans.latency
203.16ms	server6	thefountain.org	Tokyo	Operation Duration	demo.trans.latency
202.13ms	server1	zibobodesign.net	Paris	Operation Duration	demo.trans.latency
202.1ms	server1	thefountain.org	Paris	Operation Duration	demo.trans.latency
201.66ms	server5	thefountain.org	Tokyo	Operation Duration	demo.trans.latency
201.28ms	server5	zibobodesign.net	Tokyo	Operation Duration	demo.trans.latency
201.15ms	server2	samslack.com	Paris	Operation Duration	demo.trans.latency
200.29ms	server4	samslack.com	Tokyo	Operation Duration	demo.trans.latency
200.14ms	server3	samslack.com	Paris	Operation Duration	demo.trans.latency
199.12ms	server6	samslack.com	Tokyo	Operation Duration	demo.trans.latency
198ms	server1	samslack.com	Paris	Operation Duration	demo.trans.latency
197.27ms	server5	samslack.com	Tokyo	Operation Duration	demo.trans.latency

Tables Can Be Fancy

- Just the fields you want
- Sparklines, etc

Current Latency By Customer 10s		Current Latency By DC, Customer 10s 200ms SLO			<u> </u>	
	247.2ms	Paris zibobodesign.net		213.5ms	Tokyo samslack.com	
	247.1ms	Paris thefountain.org		250.5ms	Paris thefountain.org	
	213.2ms	Tokyo zibobodesign.net		217.7ms	Tokyo zibobodesign.net	
	209.2ms	Tokyo samslack.com		250.6ms	Paris zibobodesign.net	
	242.2ms	Paris samslack.com		217.6ms	Tokyo thefountain.org	
	213.5ms	Tokyo thefountain.org		245.5ms	Paris samslack.com	

Line Versus Heat

- Too many lines actually hide signal
- Heatmaps show outliers
- Saturation is low accuracy tho



Area?

- Good for "parts of a sum"
- Only use stacked
- But which things are contributing?

Total duration of operations



(Sometimes) Better Than Area

- Show sum as single line
- Separate per-item unstacked line for outliers



Bars

- Beware aggregation
- Best for comparisons of a few values



Sneaky Aggregation

- Beware aggregation
- Very common source of confusion



Other Junk

- Don't use gauges with no upper & lower bounds
- Graphics not conveying data waste of pixels
- Beware of too many colors, alerts, and distractions

Visualization Choices

- Use tables for single values
- Use lines for 1 > x < a few
- Seriously, use line charts
- Heat maps for lots of lines
- Bars for small comparisons



More Likely To Be Suitable

Less Likely To Be Suitable



Practitioners Need Context

- We need to empower humans
- There's lots of context we can add
 - \circ Info about the data
 - Happenings in the org
 - Next steps

Scale, Units, Norms, Labels





Text

- Stop being lazy, write some stuff
- Descriptions, titles, watermarks, etc

Success Ratio 10s		Ļ	Success Ratio 10s	
100 99.80			¹⁰⁰ Target SLO 99.99%	_
99.60			99.5	
99.20				
08:05	08:10	08:15	08:05 08:10 08:15	

Mark Targets

- Facilitates comparison of data to goal
- Much less cognitive load



More Text

- Help out the user, give links and explanations
- What does the user do with this?

Charts - Trend Q Total number of charts	Dashboards - Trend
0.5	0.5
Charts - Info	Dashboards - Info ····
Metric: sf.org.num.chart	Metric: sf.org.num.dashboard
Total number of charts; includes any charts created using the SignalFx API but not associated with a dashboard.	Total number of dashboards; includes all user, custom, and built-in dashboards.

Next Steps

- What can the user do?
- Iterate and improve this!

Success Ratio 10s	Operation Duration
100 Target SLO 99.99%	Jump to Service Errors
99.5	Create Incident

Situational Awareness

- Control-rate events
- Deploys, feature flags, scaling, etc
- Make this easy to toggle





Dashboard with important things, careful attention grabbers, and context



Charts with clear explanation, bounds, and next steps



Why do this?

- Tools only useful if used by humans
- This is how we manage complexity
- Decreasing cognitive effort leaves more room for knowledge-based work

How to demonstrate value

- Measure usage
- Solicit feedback
- Train
- Use with deployments, chaos/fault inj/gameday
- Collect usage with incidents
- Garden
- Consider the whole
- Integration with tools

How to revive your dashboards

- Deliberately design
- Support progression
- Prefer symptoms, use tables and line charts
- Emphasize what's important, favor next steps
- For crying out loud label, describe, and link
- Add context, bruh

Grow capabilities

- Eliminate unnecessary work
- Balance automation
- Teach up the basics
- Encourage experiments and practice

Would you like to know more?









Copyrighted Material

Information Dashboard Design Stephen Few

> The Design of Everyday Things Don Norman



The Visual Display of Quantitative Information Edward R Tufte

Thank you!

- @gphat
- onemogin.com
- Thanks to SignalFx/Splunk for paying me
- Come see me!