



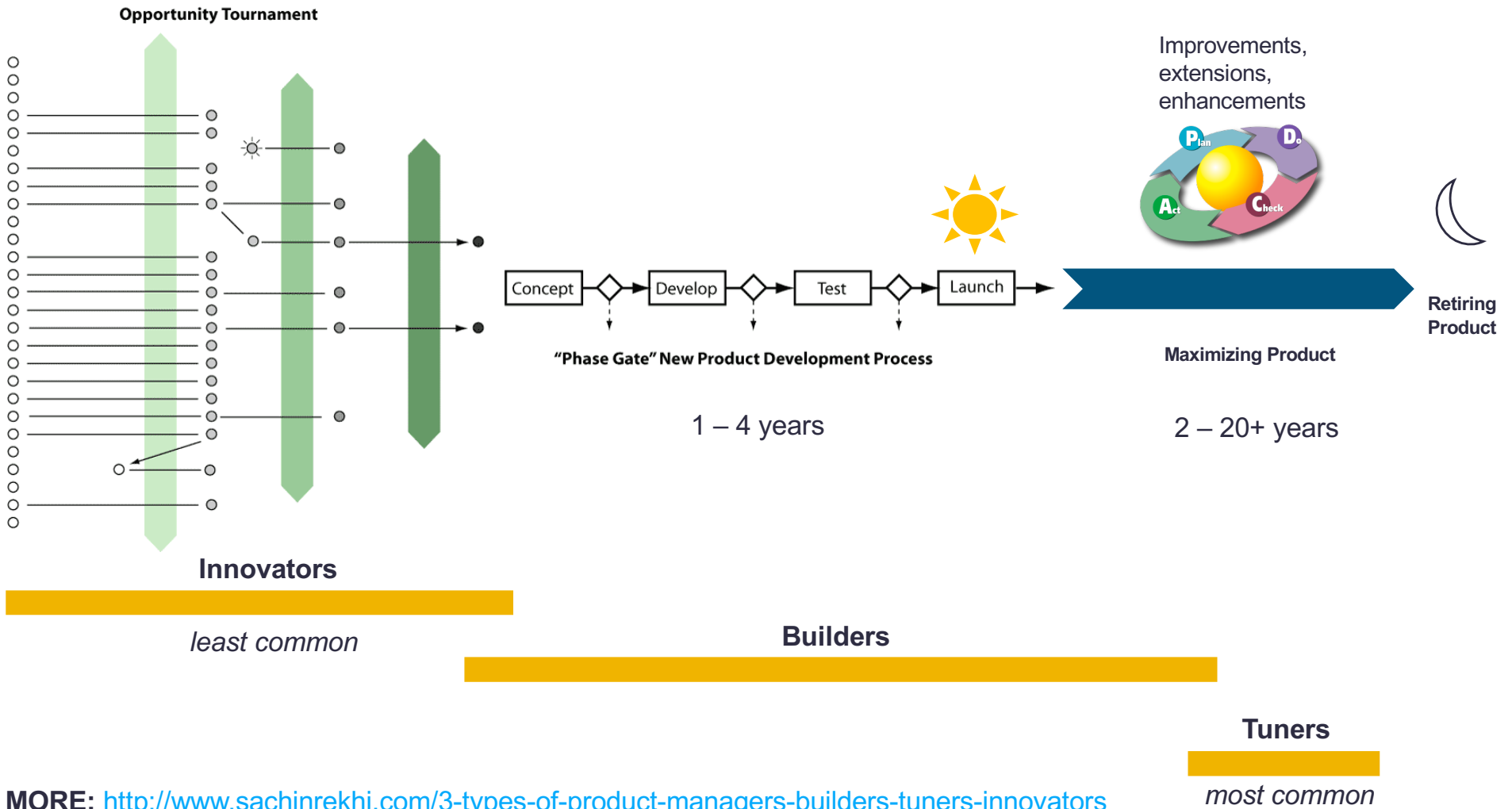
# KPIs, Dashboards, Data Graphics

Professor Karl T. Ulrich

Vice Dean of Entrepreneurship & Innovation

@ktulrich | ktulrich.com | ulrich@wharton.upenn.edu

# Product Management Roles and the Product Lifecycle



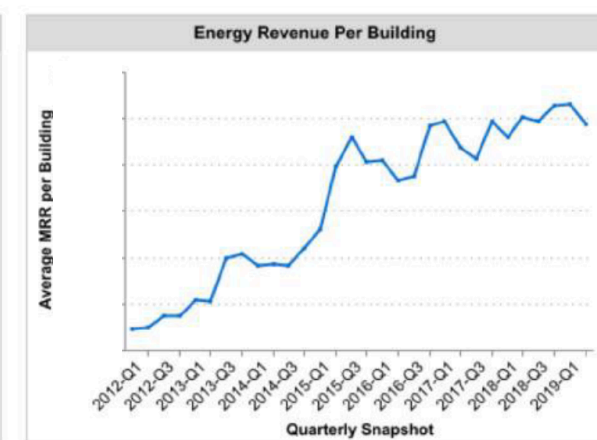
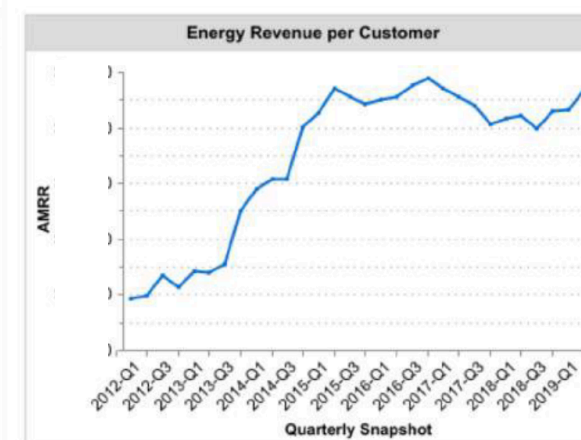
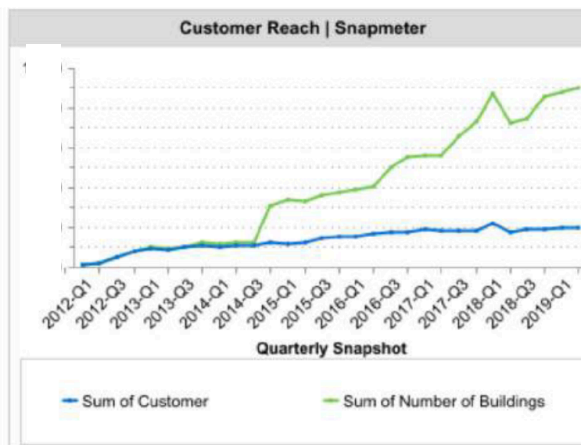
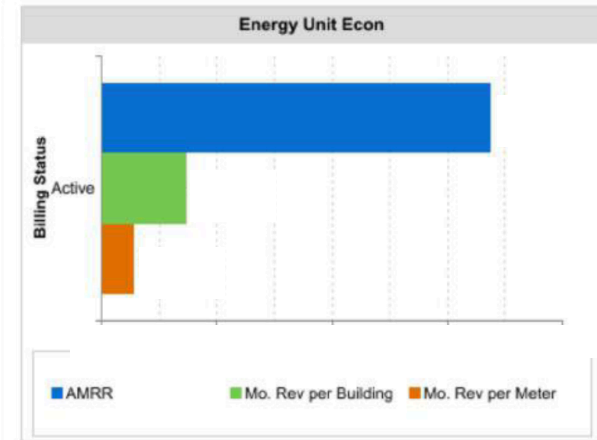
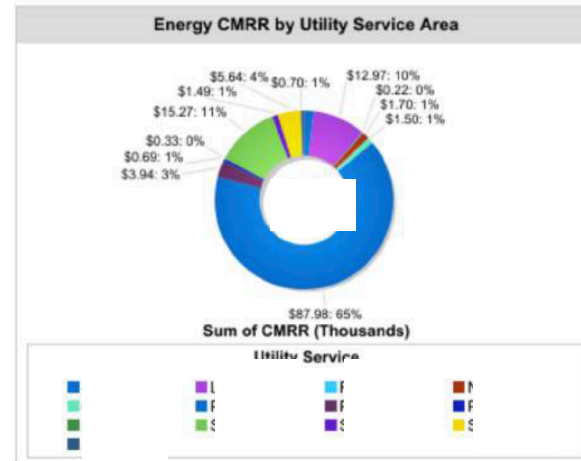
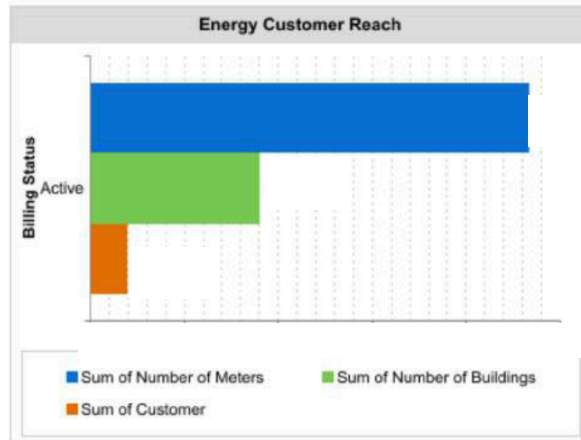
MORE: <http://www.sachinrekhi.com/3-types-of-product-managers-builders-tuners-innovators>

## Current SaaS | Energy (as of 8/2)

Energy at \$ K up from \$ K. Q-Q growth.

### KPIs and Dashboards

1. What to show.
2. How to show it.



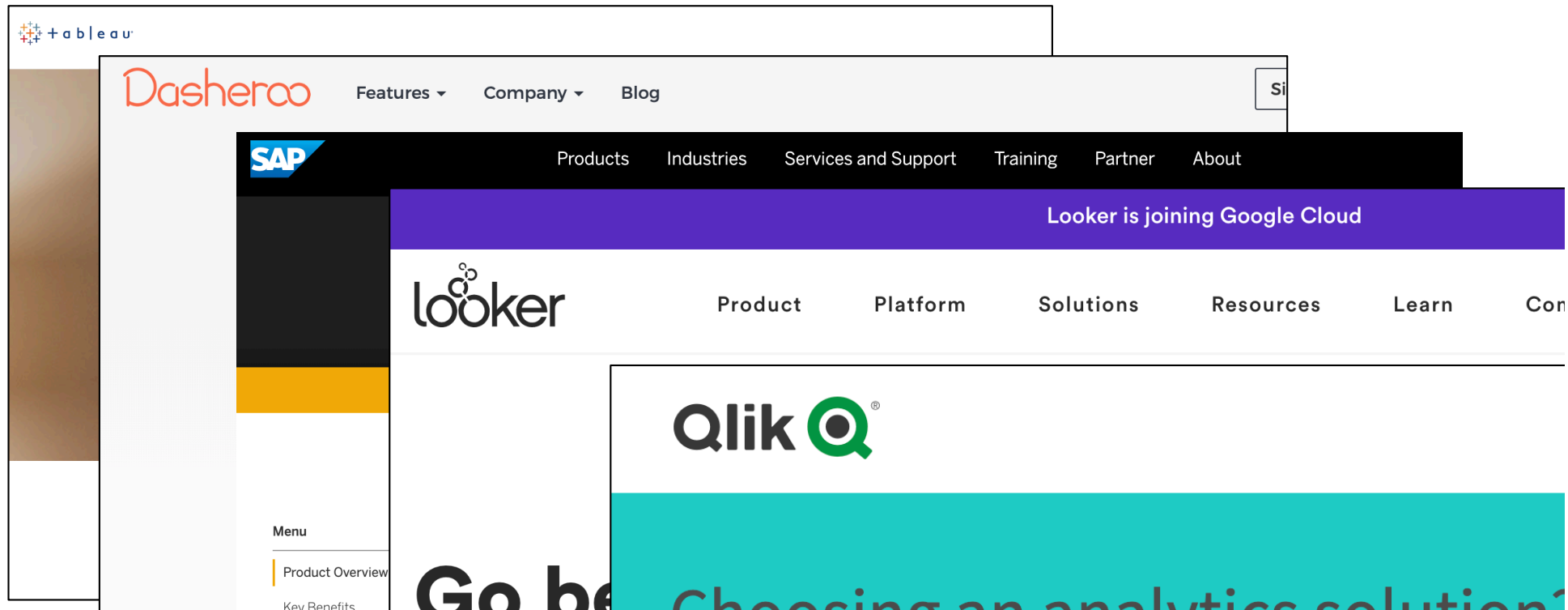
## Dashboards

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

*Stephen Few*

“Business Intelligence” or “BI”

Quite a few commercial products available for dashboards (e.g., Tableau, Dasheroo, SAP Business Objects, Looker, Qlik)





## The business

We are a single source supplier that offers laser cut materials, specializing in **laser cutter** and **CNC woods, papers, and plastics**, in a variety of styles and sizes with no minimums to leaders of fabrication labs, makerspaces and to DIYers and individual makers. We provide fast and cost effective delivery (**one day to many cities**) right to your home or lab.

### All Products



2020-Budget-Plan

File Edit View Insert Format Data Tools Add-ons Help Last edit was 6 days ago

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	2019	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ave/Total
3														
4	New Lab Customers Acquired	6	6	6	6	6	6	6	6	6	6	6	6	6.0
5	N Lab Customers	24	30	36	42	48	54	60	66	72	78	84	90	
6	N Orders/Year/Lab	6	6	6	6	6	6	6	6	6	6	6	6	
7														
8	Ave Order Value	600	600	600	600	600	600	600	600	600	600	600	600	
9	Ave Lab GM%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	
10	Lab Seasonality Factor	150%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100.0%
11	N DTM Orders	20	20	20	20	20	20	20	20	20	20	20	20	
12	Ave DTM Order Value	60	60	60	60	60	60	60	60	60	60	60	60	
13	Ave DTM GM%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	
14														
15	Lab Revenue	10,800	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	9,000	204,750
16	Lab COGS	5,400	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	102,375
17	Lab GM	5,400	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	4,500	
18														
19	DTM Revenue	1,200	1,800	2,400	3,000	3,600	4,200	4,800	5,400	6,000	6,600	7,200	7,800	27,600
20	DTM COGS	300	450	600	750	900	1,050	1,200	1,350	1,500	1,650	1,800	1,950	20,700
21	DTM GM	900	1,350	1,800	2,250	2,700	3,150	3,600	4,050	4,500	5,000	5,400	5,850	
22														
23	Total Revenue	12,000	10,800	13,200	12,450	9,000	17,400	5,700	30,900	34,200	32,850	30,000	23,850	232,350
24	Total COGS	5,700	4,950	6,000	5,475	4,050	8,400	2,550	15,150	16,650	15,525	13,800	11,025	109,275
25	Total GM%	53%	54%	55%	56%	55%	52%	55%	51%	51%	53%	54%	54%	53%
26	Total GM	6,300	5,850	7,200	6,975	4,950	9,000	3,150	15,750	17,550	17,325	16,200	12,825	123,075
27														
28	Sales & Marketing Expense	1,000	1,250	1,500	1,500	2,000	2,000	1,000	1,500	2,000	5,000	2,000	1,000	21,750
29														
30	Other SG&A	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	180,000
31														

The financial model

- Operating profit
- Cash flow

## The Managerial KPIs (Weekly)

Total DTC Revenue

4-week average DTC Revenue

N DTM Orders Total

4-week average N DTC Orders

Ave DTC Order Value

4-week average order value

N Orders - New DTM Customers

N Orders - Existing DTM Customers

4-week average Existing DTM Customer Orders

% of Repeat Customers Ordering (4-wk ave)

New DTC Customers

Total DTC Customers (ordered within 180 days)

Total DTC Repeat Customers (ordered within 180 days)

Adwords Spend

CAC

4-week average CAC (target is \$XX)

Total Unique Visitors (Google Analytics)

Organic Unique Visitors

4-week average Organic Uniques

Paid Users

Site Conversion Rate

4-week average conversion rate

Makerstock.com Domain Authority

Inbound Links (Unique Domains Linking to Us)

For tech product managers specifically:

- Acquisition
- Engagement
- Satisfaction
- Monetization

## Some Common PM KPIs in Software

Monthly recurring revenue (MRR)

Customer Lifetime Value (CLTV or LTV)

Customer Acquisition Cost (CAC)

Daily Active Users

Weekly/Monthly Active Users

Session duration

Paid traffic

Organic traffic

Bounce rate

Churn rate

Net Promoter Score

Customer satisfaction score

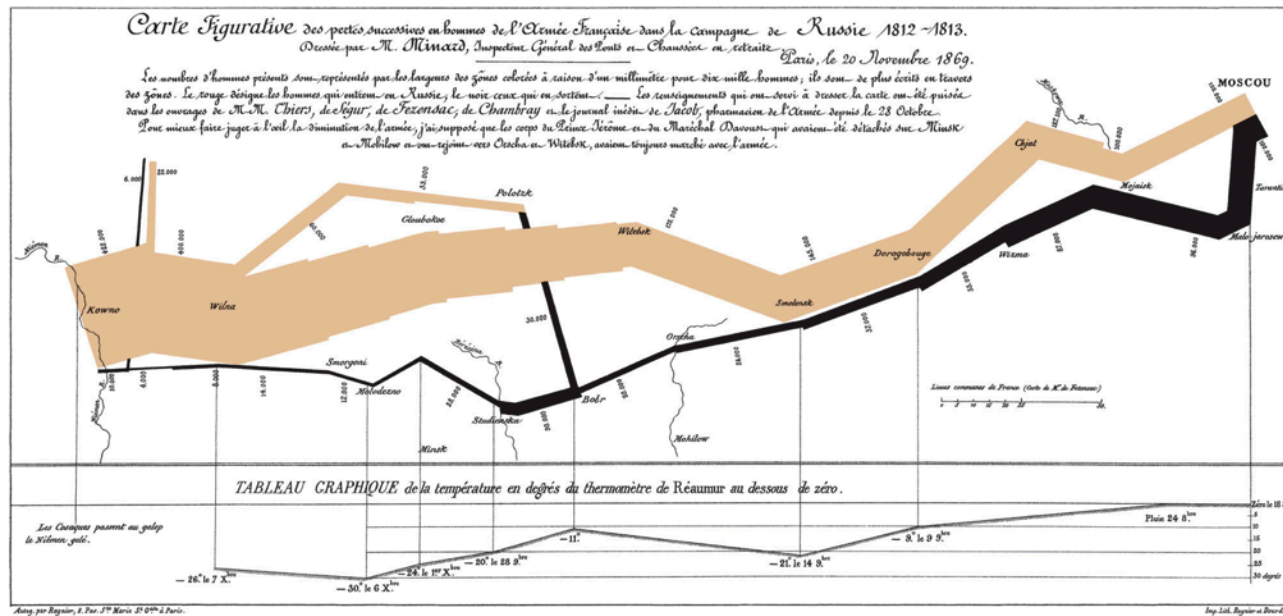
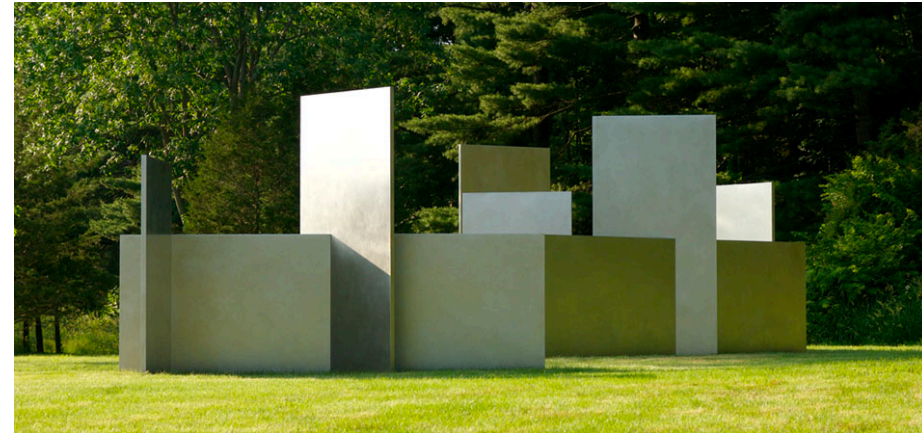


# Edward Tufte (b1942)

"The DaVinci of Data"

Also...

Yale Professor of Statistics  
Sculptor  
Self-publishing phenomenon

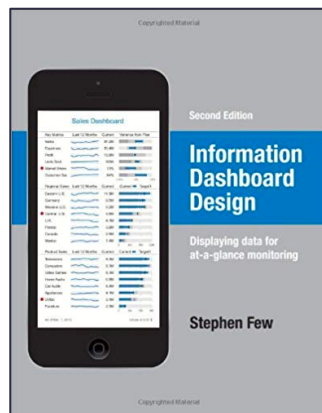


One-day workshops once or twice a year.  
<http://www.edwardtufte.com/>

# Stephen Few

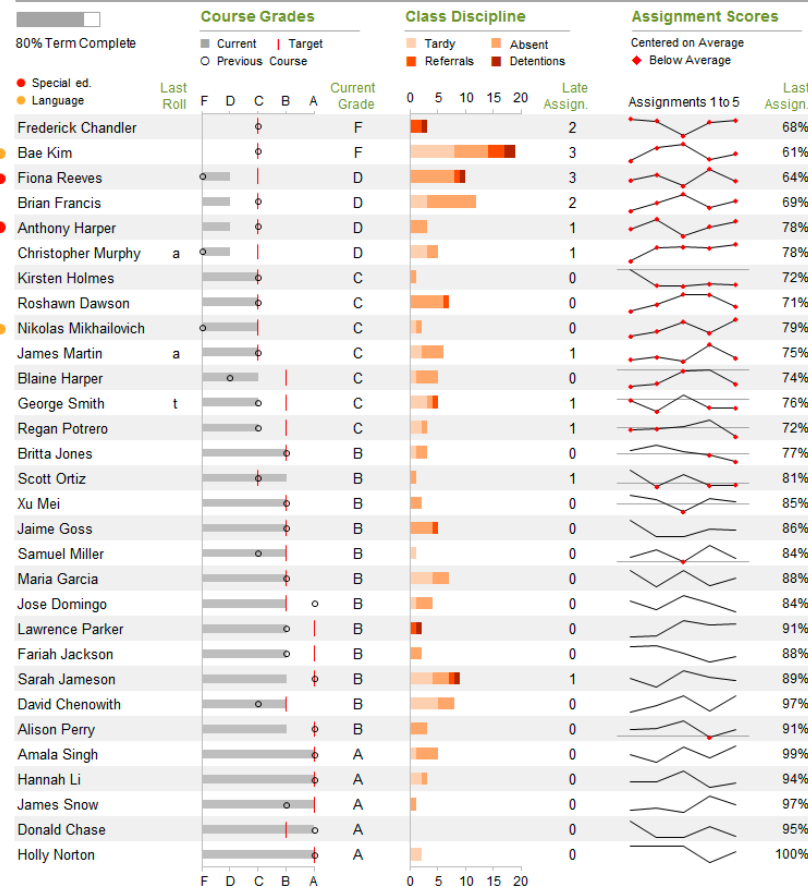
(Very practical Tufte ... without the style)

<http://www.perceptualedge.com>



May 1, 2012  
Tuesday

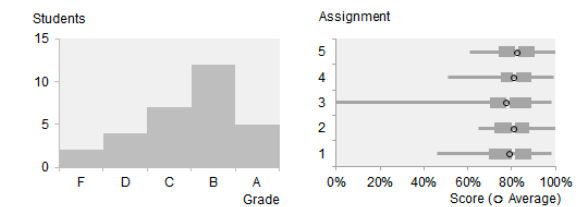
## Grade 10 Algebra Course



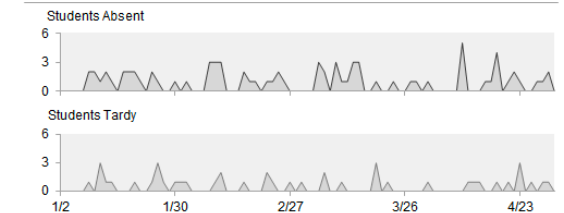
Note: All scores are expressed as percentage of points earned out of the total points possible.

HELP

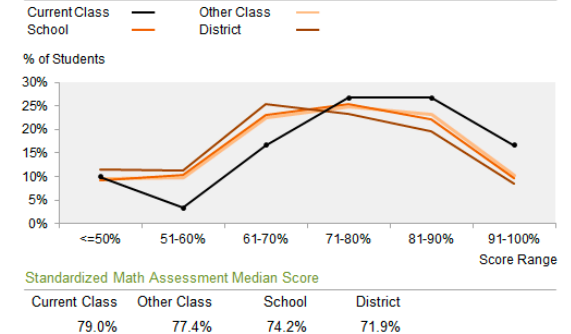
## Grade and Assignment Score Distribution



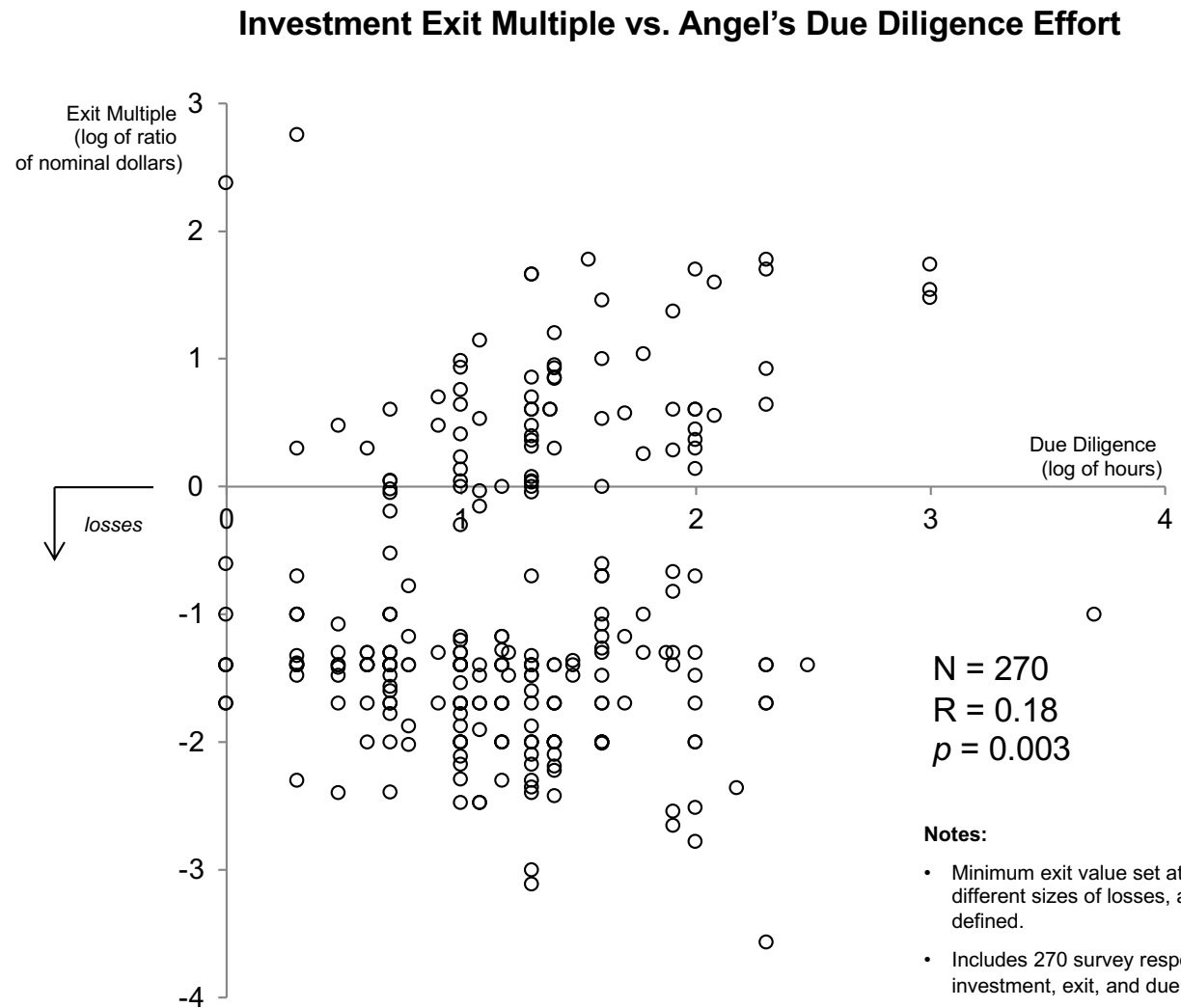
## Attendance (excluding weekends)



## Standardized Math Assessment Score Distribution



1. Above all else,  
show the data.



Source: Kauffman Foundation Angel Survey 2007

K. Ulrich – Nov. 10, 2019

## 2. Start with a good table. May be all you need.

Product Name	Section	Mystery	Students	Public	Total	Raw Share	Weighted Vote Total	Weighted Share	Price	Unit Cost	Margin	% Margin	Estimated Profits
DesKlip	414	8	14	89	111	4.6%	127	4.68%	\$ 35.00	\$ 4.81	\$ 19.69	80%	\$ 941,226
Flada	412	5	11	70	86	3.6%	96	3.54%	\$ 50.00	\$ 3.08	\$ 31.92	91%	\$ 807,377
JogBuddy	411	4	14	76	94	3.9%	102	3.76%	\$ 50.00	\$ 5.00	\$ 30.00	86%	\$ 806,239
Wrist Angel	413	8	13	44	65	2.7%	81	2.99%	\$ 14.95	\$ 1.00	\$ 9.47	90%	\$ 675,580
CoatGuard	411	7	12	58	77	3.2%	91	3.36%	\$ 50.00	\$ 8.24	\$ 26.76	76%	\$ 641,608
Nima	412	8	9	43	60	2.5%	76	2.80%	\$ 20.00	\$ 1.62	\$ 12.38	88%	\$ 619,750
Super Scrubber	414	0	11	64	75	3.1%	75	2.77%	\$ 49.99	\$ 4.00	\$ 30.99	89%	\$ 612,568
Spatutong	414	4	8	63	75	3.1%	83	3.06%	\$ 15.99	\$ 2.60	\$ 8.59	77%	\$ 587,607
3Denti	411	2	10	68	80	3.3%	84	3.10%	\$ 15.00	\$ 2.91	\$ 7.59	72%	\$ 559,941
Key Keep	414	6	18	25	49	2.0%	61	2.25%	\$ 19.99	\$ 1.00	\$ 12.99	93%	\$ 522,323
Cut[tupp]	411	11	13	30	54	2.2%	76	2.80%	\$ 6.00	\$ 1.14	\$ 3.06	73%	\$ 510,618
Hanger Loose	412	4	15	38	57	2.4%	65	2.40%	\$ 16.95	\$ 1.86	\$ 10.01	84%	\$ 505,444
Tri Top	414	5	12	56	73	3.0%	83	3.06%	\$ 24.95	\$ 6.19	\$ 11.28	65%	\$ 494,125
Beddersheet	412	1	10	52	63	2.6%	65	2.40%	\$ 35.00	\$ 5.10	\$ 19.40	79%	\$ 474,635
Trimswell	411	2	12	64	78	3.2%	82	3.02%	\$ 6.99	\$ 1.85	\$ 3.04	62%	\$ 470,274
E-Packit	412	2	13	37	52	2.2%	56	2.07%	\$ 14.95	\$ 1.00	\$ 9.47	90%	\$ 467,068
CompCove	414	6	13	33	52	2.2%	64	2.36%	\$ 49.99	\$ 7.52	\$ 27.47	79%	\$ 463,357
PILLight	413	0	12	44	56	2.3%	56	2.07%	\$ 24.99	\$ 2.32	\$ 15.17	87%	\$ 447,925
easl	413	0	17	48	65	2.7%	65	2.40%	\$ 50.00	\$ 9.28	\$ 25.72	73%	\$ 440,481
LitSwitch	414	0	13	60	73	3.0%	73	2.69%	\$ 19.99	\$ 6.06	\$ 7.93	57%	\$ 381,645

The people you work with are smart.

They can process a lot of information if you make it available to them.

If you have a lot of items (e.g., >20), use a table, print it, and hand it out.

Product Name	Section	Mystery	Students	Public	Total	Raw Share	Weighted Vote Total	Weighted share	Price	Unit Cost	Margin	% Margin	Estimated Profits
DeskKlip	414	8	14	89	111	4.6%	127	4.68%	\$ 35.00	\$ 4.81	\$ 19.69	80%	\$ 941,226
Flada	412	5	11	70	86	3.6%	96	3.54%	\$ 50.00	\$ 3.08	\$ 31.92	91%	\$ 807,377
JogBuddy	411	4	14	76	94	3.9%	102	3.76%	\$ 50.00	\$ 5.00	\$ 30.00	86%	\$ 806,239
Wrist Angel	413	8	13	44	65	2.7%	81	2.99%	\$ 14.95	\$ 1.00	\$ 9.47	90%	\$ 675,580
CoatGuard	411	7	12	58	77	3.2%	91	3.36%	\$ 50.00	\$ 8.24	\$ 26.76	76%	\$ 641,608
Nima	412	8	9	43	60	2.5%	76	2.80%	\$ 20.00	\$ 1.62	\$ 12.38	88%	\$ 619,750
Super Scrubber	414	0	11	64	75	3.1%	75	2.77%	\$ 49.99	\$ 4.00	\$ 30.99	89%	\$ 612,568
Spatutong	414	4	8	63	75	3.1%	83	3.06%	\$ 15.99	\$ 2.60	\$ 8.59	77%	\$ 587,607
3Denti	411	2	10	68	80	3.3%	84	3.10%	\$ 15.00	\$ 2.91	\$ 7.59	72%	\$ 559,941
Key Keep	414	6	18	25	49	2.0%	61	2.25%	\$ 19.99	\$ 1.00	\$ 12.99	93%	\$ 522,323
Cut[tuppl]	411	11	13	30	54	2.2%	76	2.80%	\$ 6.00	\$ 1.14	\$ 3.06	73%	\$ 510,618
Hanger Loose	412	4	15	38	57	2.4%	65	2.40%	\$ 16.95	\$ 1.86	\$ 10.01	84%	\$ 505,444
Tri Top	414	5	12	56	73	3.0%	83	3.06%	\$ 24.95	\$ 6.19	\$ 11.28	65%	\$ 494,125
Beddersheet	412	1	10	52	63	2.6%	65	2.40%	\$ 35.00	\$ 5.10	\$ 19.40	79%	\$ 474,635
Trimswell	411	2	12	64	78	3.2%	82	3.02%	\$ 6.99	\$ 1.85	\$ 3.04	62%	\$ 470,274
E-Packit	412	2	13	37	52	2.2%	56	2.07%	\$ 14.95	\$ 1.00	\$ 9.47	90%	\$ 467,068
CompCove	414	6	13	33	52	2.2%	64	2.36%	\$ 49.99	\$ 7.52	\$ 27.47	79%	\$ 463,357
PILLight	413	0	12	44	56	2.3%	56	2.07%	\$ 24.99	\$ 2.32	\$ 15.17	87%	\$ 447,925
easi	413	0	17	48	65	2.7%	65	2.40%	\$ 50.00	\$ 9.28	\$ 25.72	73%	\$ 440,481
LitSwitch	414	0	13	60	73	3.0%	73	2.69%	\$ 19.99	\$ 6.06	\$ 7.93	57%	\$ 381,645
Snooze Pillow	412	0	14	37	51	2.1%	51	1.88%	\$ 49.99	\$ 9.47	\$ 25.52	73%	\$ 343,029
Parabottle	413	3	13	22	38	1.6%	44	1.62%	\$ 29.99	\$ 4.62	\$ 16.37	78%	\$ 316,459
Glide	412	4	11	29	44	1.8%	52	1.92%	\$ 24.95	\$ 6.92	\$ 10.55	60%	\$ 289,529
Infusera	412	1	9	28	38	1.6%	40	1.48%	\$ 40.00	\$ 6.66	\$ 21.34	76%	\$ 281,130
PourBoss	413	2	14	14	30	1.2%	34	1.25%	\$ 6.99	\$ 0.66	\$ 4.23	87%	\$ 271,245
SoleStrap	414	2	14	33	49	2.0%	53	1.95%	\$ 18.99	\$ 5.98	\$ 7.31	55%	\$ 268,880
mobidesk	413	2	6	43	51	2.1%	55	2.03%	\$ 45.00	\$ 15.44	\$ 16.06	51%	\$ 258,588
LiteOwl	413	4	11	14	29	1.2%	37	1.36%	\$ 20.20	\$ 4.97	\$ 9.17	65%	\$ 221,275
hibernate	412	2	7	16	25	1.0%	29	1.07%	\$ 34.99	\$ 6.04	\$ 18.45	75%	\$ 201,481
Guard Dog	412	2	1	25	28	1.2%	32	1.18%	\$ 29.99	\$ 6.93	\$ 14.06	67%	\$ 197,681
Swivel Board	414	0	9	24	33	1.4%	33	1.22%	\$ 24.99	\$ 6.24	\$ 11.25	64%	\$ 195,762
Helmlock	411	5	6	5	16	0.7%	26	0.96%	\$ 45.00	\$ 5.93	\$ 25.57	81%	\$ 194,627
LightWing	411	13	16	9	38	1.6%	64	2.36%	\$ 50.00	\$ 23.97	\$ 11.03	32%	\$ 185,994
illuminate	411	1	12	25	38	1.6%	40	1.48%	\$ 39.99	\$ 14.08	\$ 13.91	50%	\$ 183,333
readystand	411	3	11	15	29	1.2%	35	1.29%	\$ 49.00	\$ 15.83	\$ 18.47	54%	\$ 173,801
spongeSHIELD	413	4	8	1	13	0.5%	21	0.77%	\$ 9.99	\$ 1.49	\$ 5.50	79%	\$ 152,393
GrocerEase Strap	413	0	11	23	34	1.4%	34	1.25%	\$ 17.95	\$ 6.93	\$ 5.64	45%	\$ 140,611
Chop-Box	411	0	6	26	32	1.3%	32	1.18%	\$ 24.95	\$ 9.30	\$ 8.17	47%	\$ 137,958
Sleeve	414	0	14	12	26	1.1%	26	0.96%	\$ 19.99	\$ 6.41	\$ 7.58	54%	\$ 129,931
EZMeasure	413	6	9	15	30	1.2%	42	1.55%	\$ 9.99	\$ 4.81	\$ 2.18	31%	\$ 120,907
Hangsome	413	1	12	1	14	0.6%	16	0.59%	\$ 9.99	\$ 1.52	\$ 5.47	78%	\$ 115,476
Reservoir	412	0	12	22	34	1.4%	34	1.25%	\$ 39.95	\$ 17.71	\$ 10.26	37%	\$ 114,977
Tidy Bin	413	4	16	18	38	1.6%	46	1.70%	\$ 49.95	\$ 25.51	\$ 9.45	27%	\$ 114,709
Hot-To-Go	411	2	14	21	37	1.5%	41	1.51%	\$ 49.99	\$ 24.67	\$ 10.32	30%	\$ 111,537
WaterWeight	414	4	9	4	17	0.7%	25	0.92%	\$ 24.99	\$ 9.08	\$ 8.41	48%	\$ 110,876
Coup	414	1	8	8	17	0.7%	19	0.70%	\$ 50.00	\$ 13.00	\$ 22.00	63%	\$ 110,133
PinPoint	414	0	11	34	45	1.9%	45	1.66%	\$ 50.00	\$ 26.45	\$ 8.55	24%	\$ 101,373
Hive Lights	412	0	10	11	21	0.9%	21	0.77%	\$ 38.00	\$ 12.89	\$ 13.71	52%	\$ 99,813
easebox	412	1	6	1	8	0.3%	10	0.37%	\$ 4.99	\$ 0.80	\$ 2.69	77%	\$ 71,097
Travel Toothbrush	413	1	3	3	7	0.3%	9	0.33%	\$ 9.99	\$ 1.75	\$ 5.24	75%	\$ 62,226
Plantr	412	0	8	6	14	0.6%	14	0.52%	\$ 39.95	\$ 17.88	\$ 10.09	36%	\$ 46,559
Umbreon	411	0	15	24	39	1.6%	39	1.44%	\$ 10.00	\$ 6.48	\$ 0.52	7%	\$ 26,717
U-Desk	411	1	13	35	49	2.0%	51	1.88%	\$ 99.99	\$ 69.99	\$ 0.003	0.004%	\$ 20
<b>Total or Average</b>		<b>152</b>	<b>589</b>	<b>1666</b>	<b>2407</b>	<b>100.0%</b>	<b>2711</b>	<b>100.0%</b>	<b>\$ 30.97</b>				



**With modern displays, text can be smaller than you think.**

36 pt The quick

The quick

24 pt Fox jumped

Fox jumped

18 pt Over the hen.

Over the hen.

16 pt The hen dove

The hen dove

14 pt Under the bed.

Under the bed.

12 pt Need a better

Need a better

10 pt Example of text.

Example of text.

8 pt What does this say?

What does this say?

(Arial)

(Times New Roman)

# MBA program – Student Views

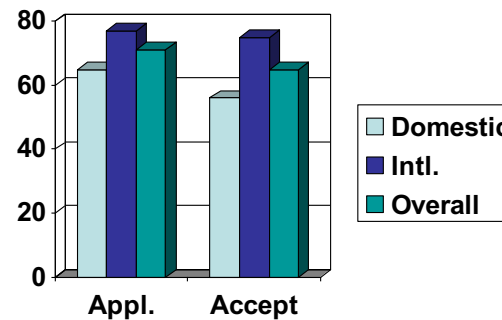
- What are the most important aspects of a global school?

<i>Domestic Students</i>	<i>International Students</i>	<i>Overall</i>
Brand Name/Reputation	Brand Name/Reputation	Brand Name/Reputation
Diverse International Student Body	Alumni Network	Diverse International Student Body
International Curriculum	Diverse International Student Body	Alumni Network
Alumni Network	Extra Curricular Activities	Extra Curricular Activities
Extra Curricular Activities	International Curriculum	International Curriculum

Real example from a real  
Wharton committee report.

# MBA program – Survey Results

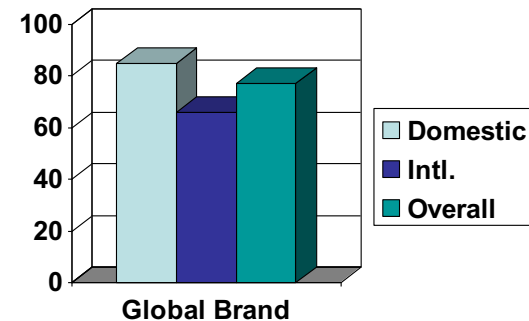
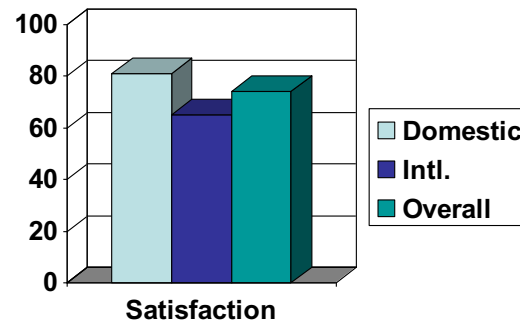
- Why is being part of a global school is important?
- Overall, 90% of the students surveyed strongly agree or agree with the statement: “It is important that a MBA education provide a global business education experience.”
- Applications and acceptance are affected



Real example from a real Wharton committee report.

# MBA program – Survey Results

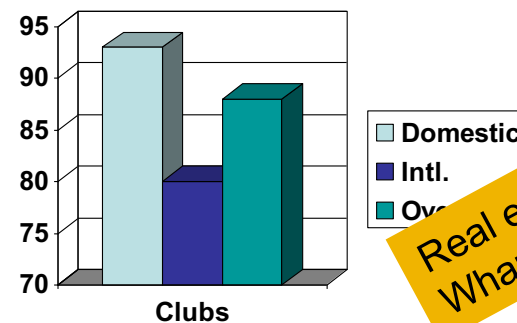
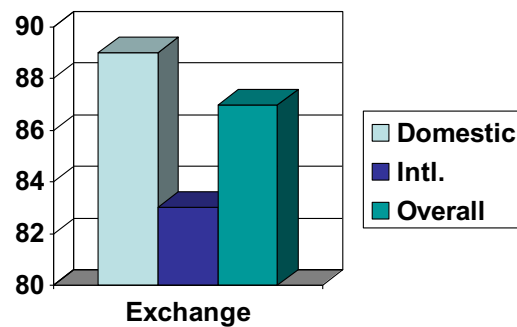
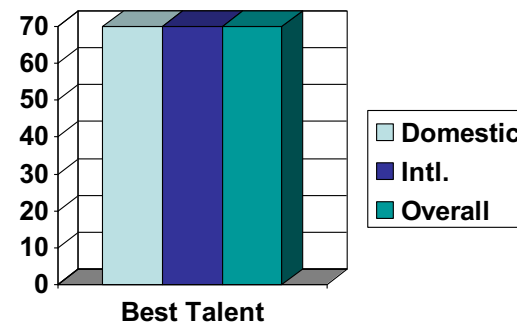
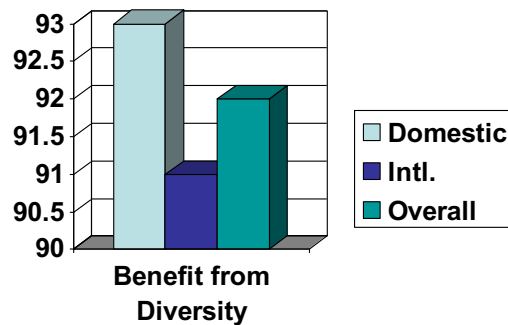
- How are we doing in delivery?
- 74% of the surveyed strongly agree or agree with the statement: “Wharton has met my expectations in terms of a global business education experience.”



Real example from a real Wharton committee report.

# MBA program – Survey Results

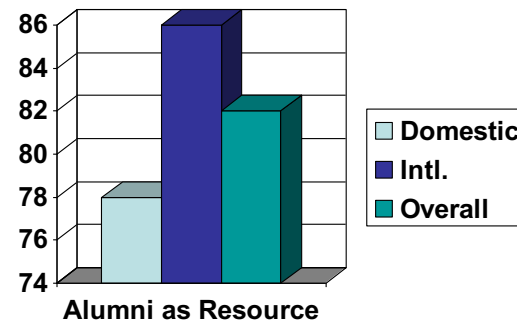
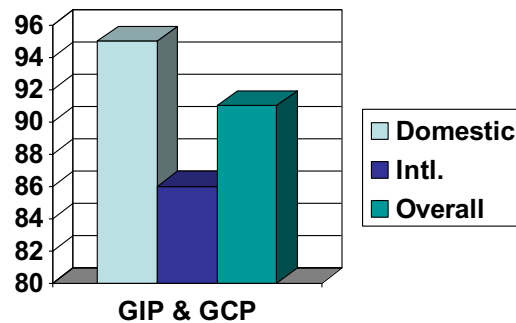
- How are we doing in delivery?



Real example from a real Wharton committee report.

# MBA program – Survey Results

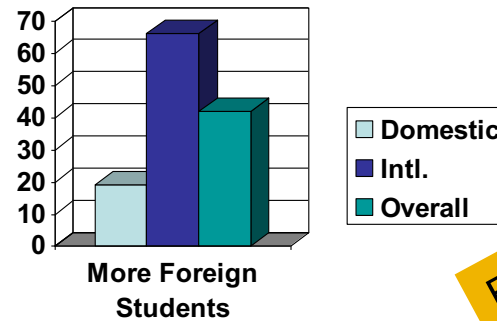
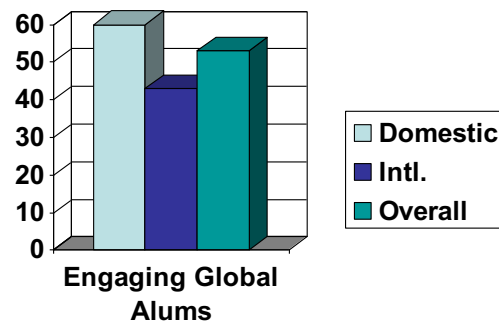
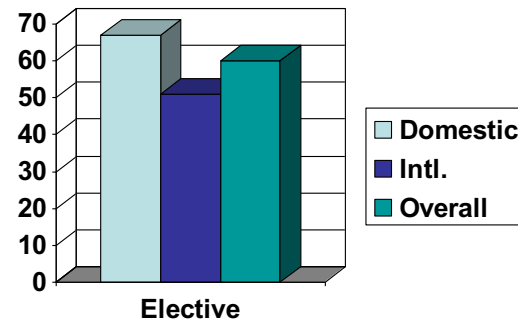
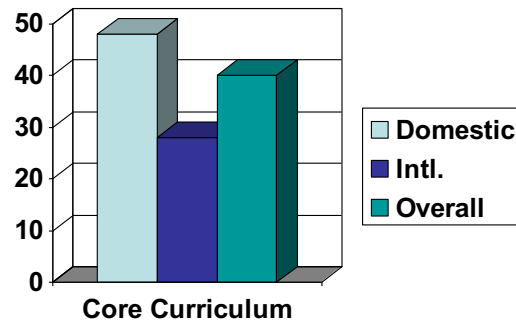
- How are we doing in delivery?



Real example from a real  
Wharton committee report.

# MBA program – Survey Results

- How are we doing in delivery?



Real example from a real Wharton committee report.

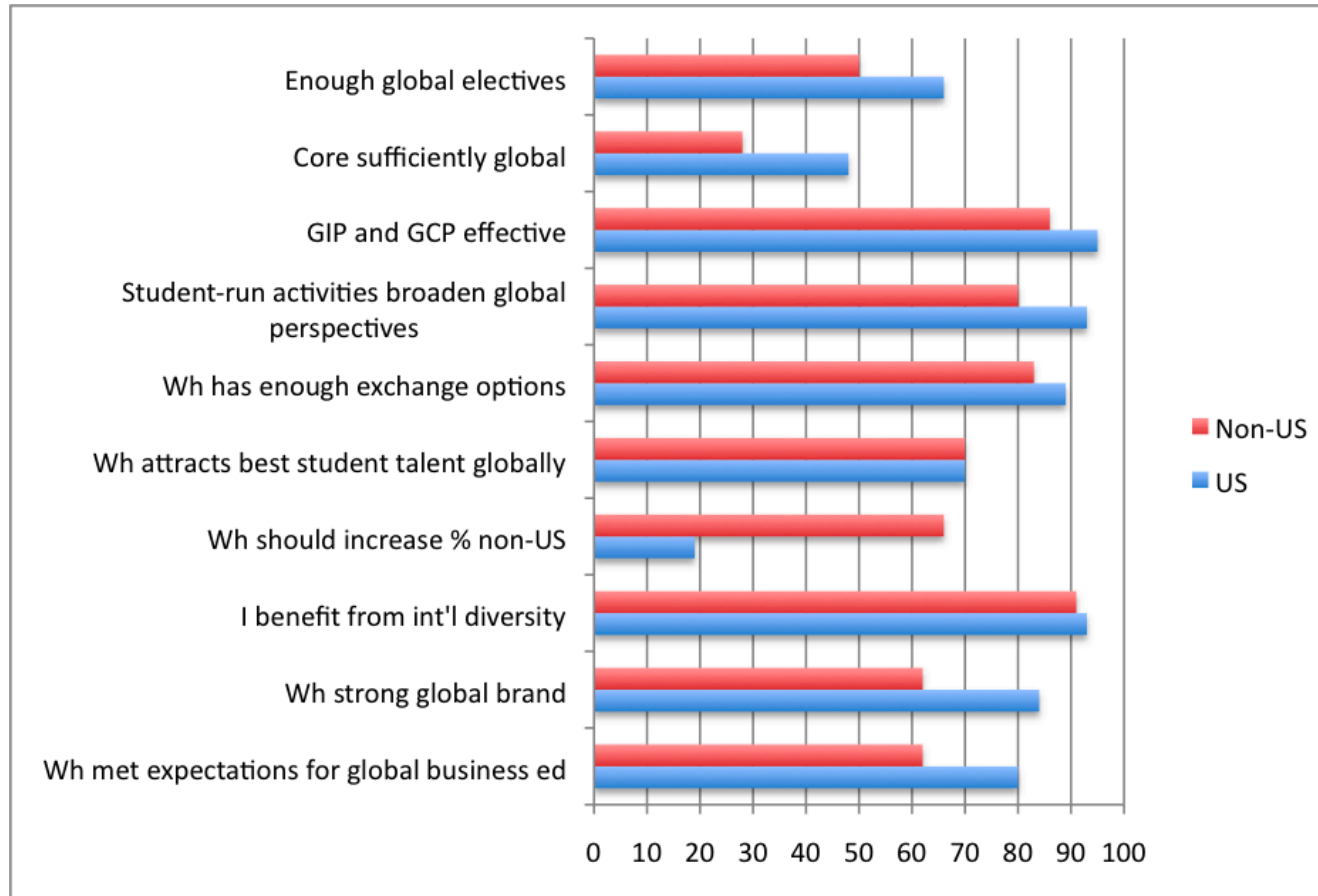
# MBA program – Survey Results

- Summary Findings
  - Being globally well-known has tangible benefits to Wharton
    - Applications
    - Acceptance
    - Learning experience
  - By and large, we are delivering along the dimensions that matter to MBA's
  - There is room to improve in adding more global content to the elective and core curriculum and in engaging global alums
  - Domestic students feel better about school's globalization efforts
  - We are probably at the upper boundary in terms of the proportion of international students

Real example from a real  
Wharton committee report.



### 3. Get as much related data as possible on one screen/page.

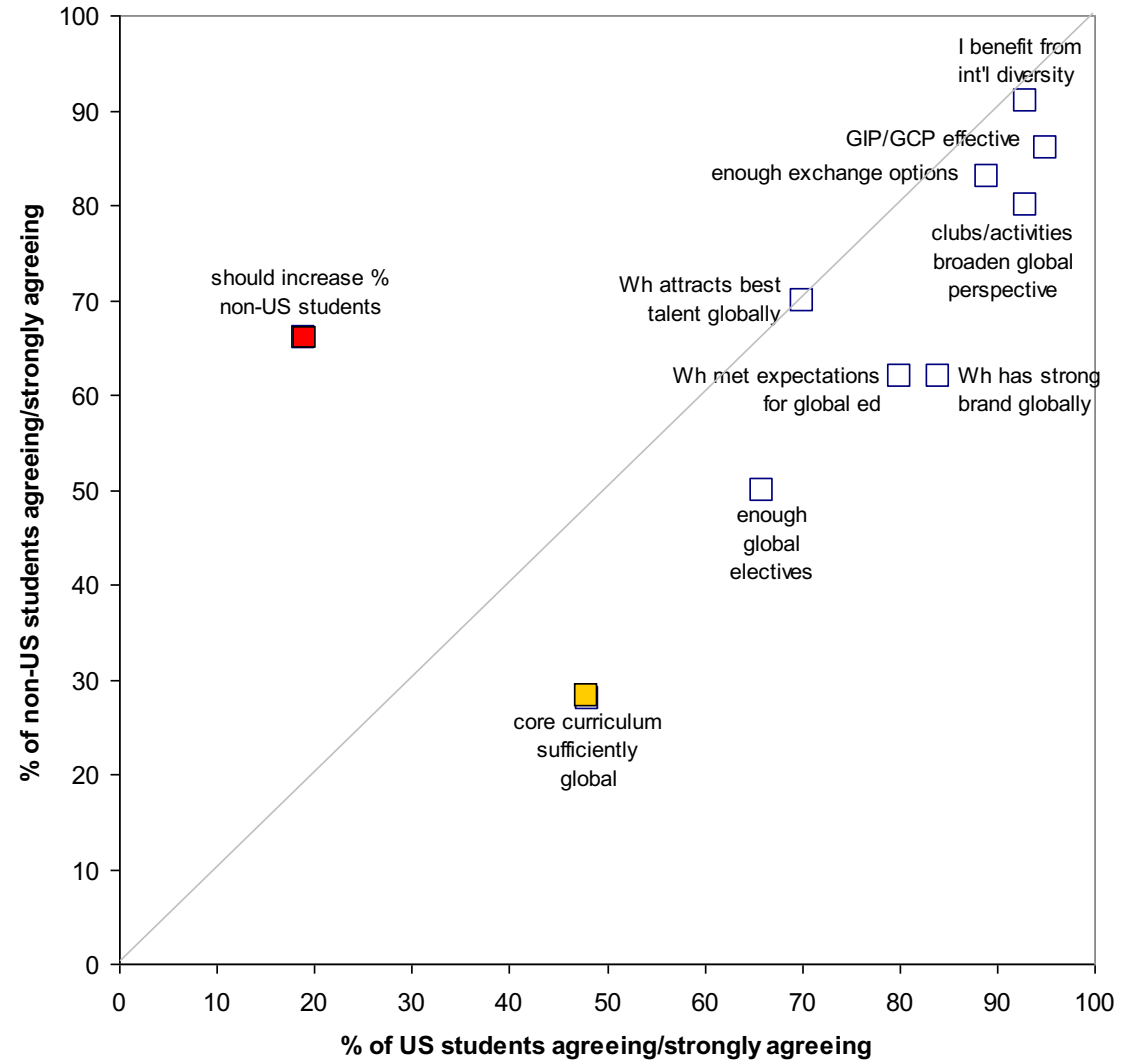


(But other than getting the data on one page, this is a terrible data graphic...See guideline 4!)

#### 4. Use scatter plots to both show relationships and enable comparisons.

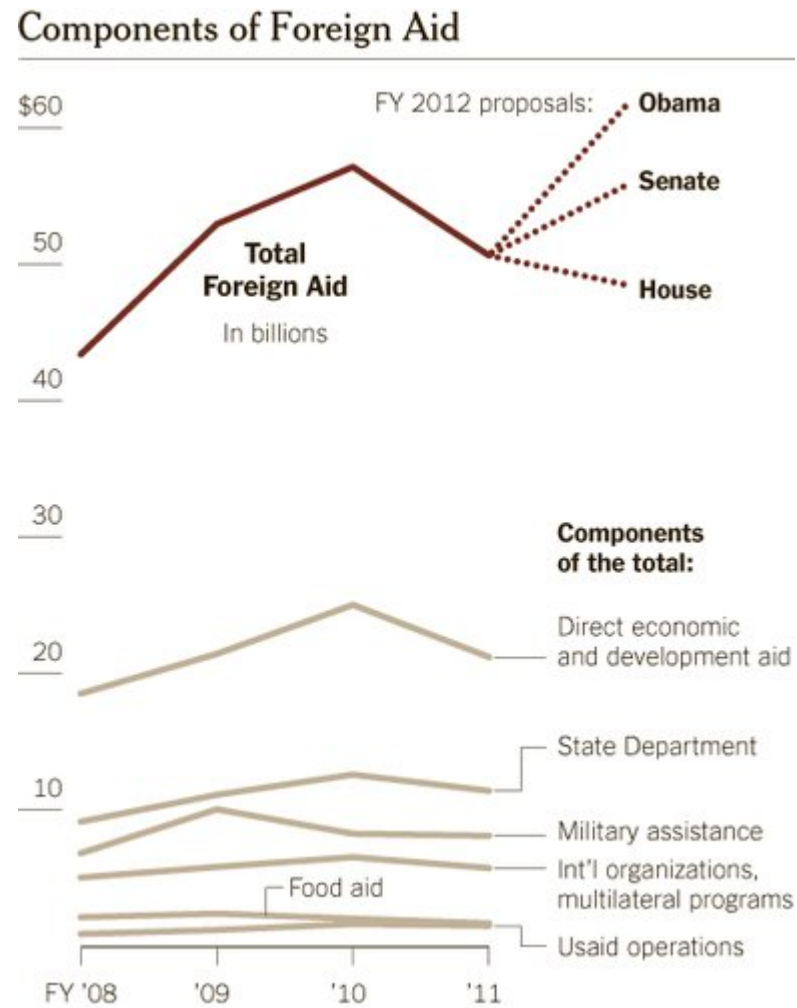
A single well-designed scatter plot allows a substantive 30-minute discussion about the issues.

**MBA Student Perspectives – US vs. Non-US Students**



**Source:** Wharton Strategy Committee survey of 377 current MBA students, December 20016.

## 5. Avoid legends. Use direct labeling instead.



Source: New York Times, 2011

## 6. Careful display of time series

194.6
191.8
190.0
190.6
190.6
190.6
190.6
190.6
189.8
188.6
190.6
188.6
189.0
189.6
189.6
187.8
187.8
188.6
189.8
188.2
187.2
184.2
191.2
192.2
192.2
189.2
187.2
187.2
188.6
188.6
187.2
185.6
185.6
185.6
185.8
185.6
186.4
186.4
184.8
186.8
186.8
187.2
185.4
186.4
187.6
187.8
188.0
188.0
189.0
186.4
187.2

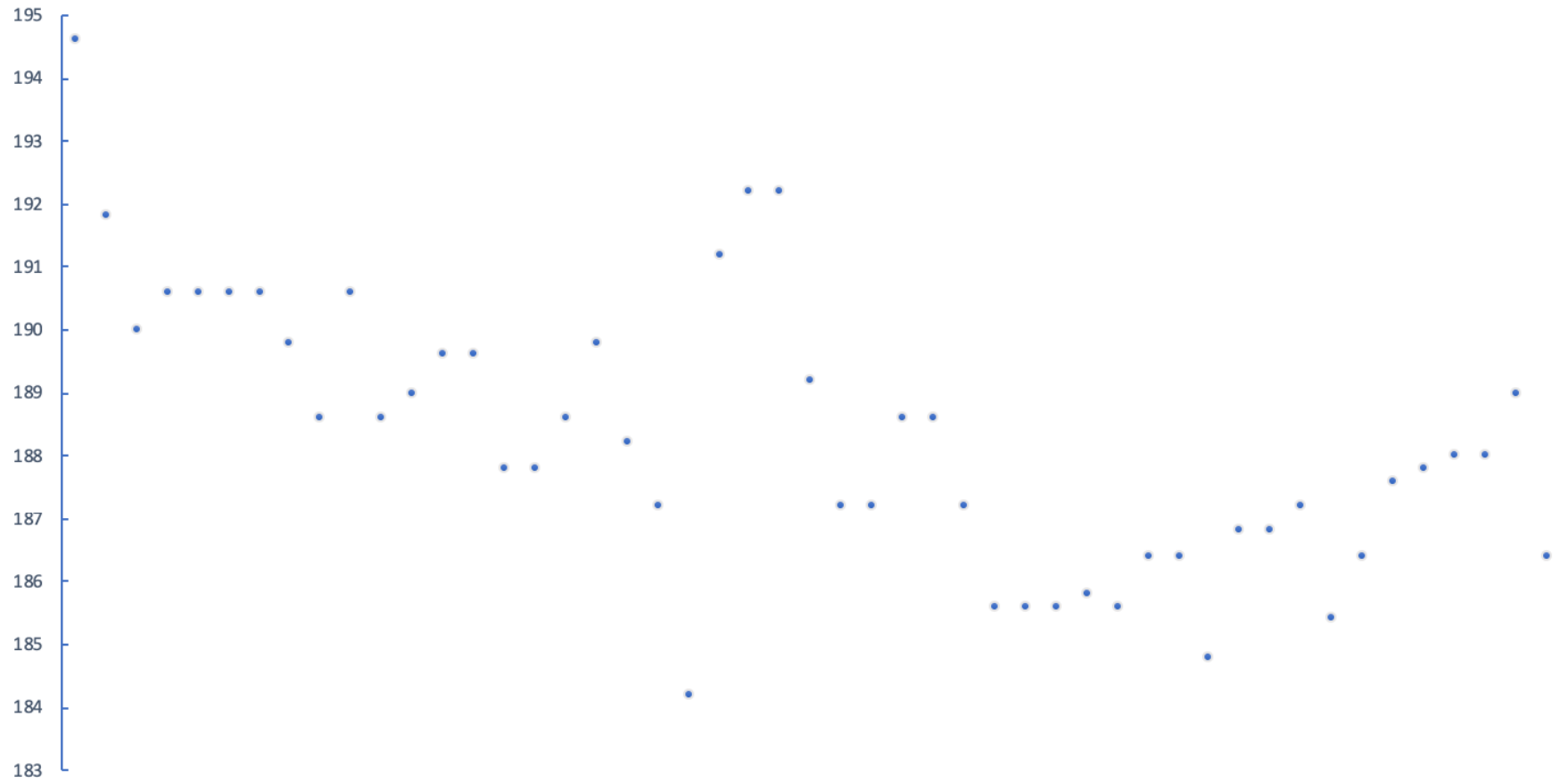
Tables are great for comparisons of a lot of values – not as helpful for detecting trends in noisy signals.

Be especially cautious with  
“% Change from Previous Period”  
with noisy data.  
(Usually meaningless and distracting)

**Source:** New York Times, 2011

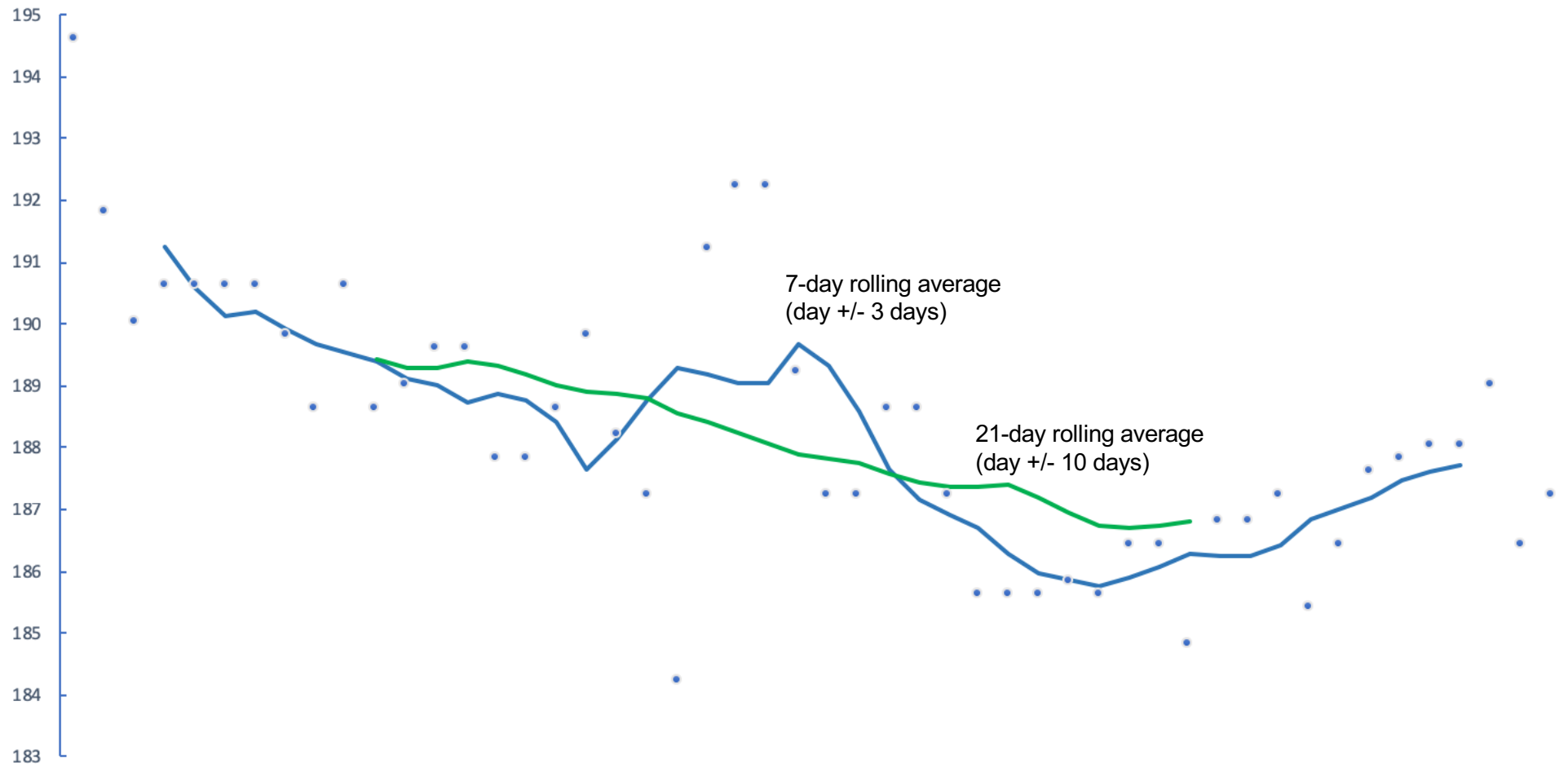
## 6. Careful display of time series

194.6
191.8
190.0
190.6
190.6
190.6
190.6
189.8
188.6
190.6
188.6
189.0
189.6
189.6
187.8
187.8
188.6
189.8
188.2
187.2
184.2
191.2
192.2
192.2
189.2
187.2
187.2
188.6
188.6
187.2
185.6
185.6
185.6
185.8
185.6
186.4
186.4
184.8
186.8
186.8
187.2
185.4
186.4
187.6
187.8
188.0
188.0
189.0
186.4
187.2

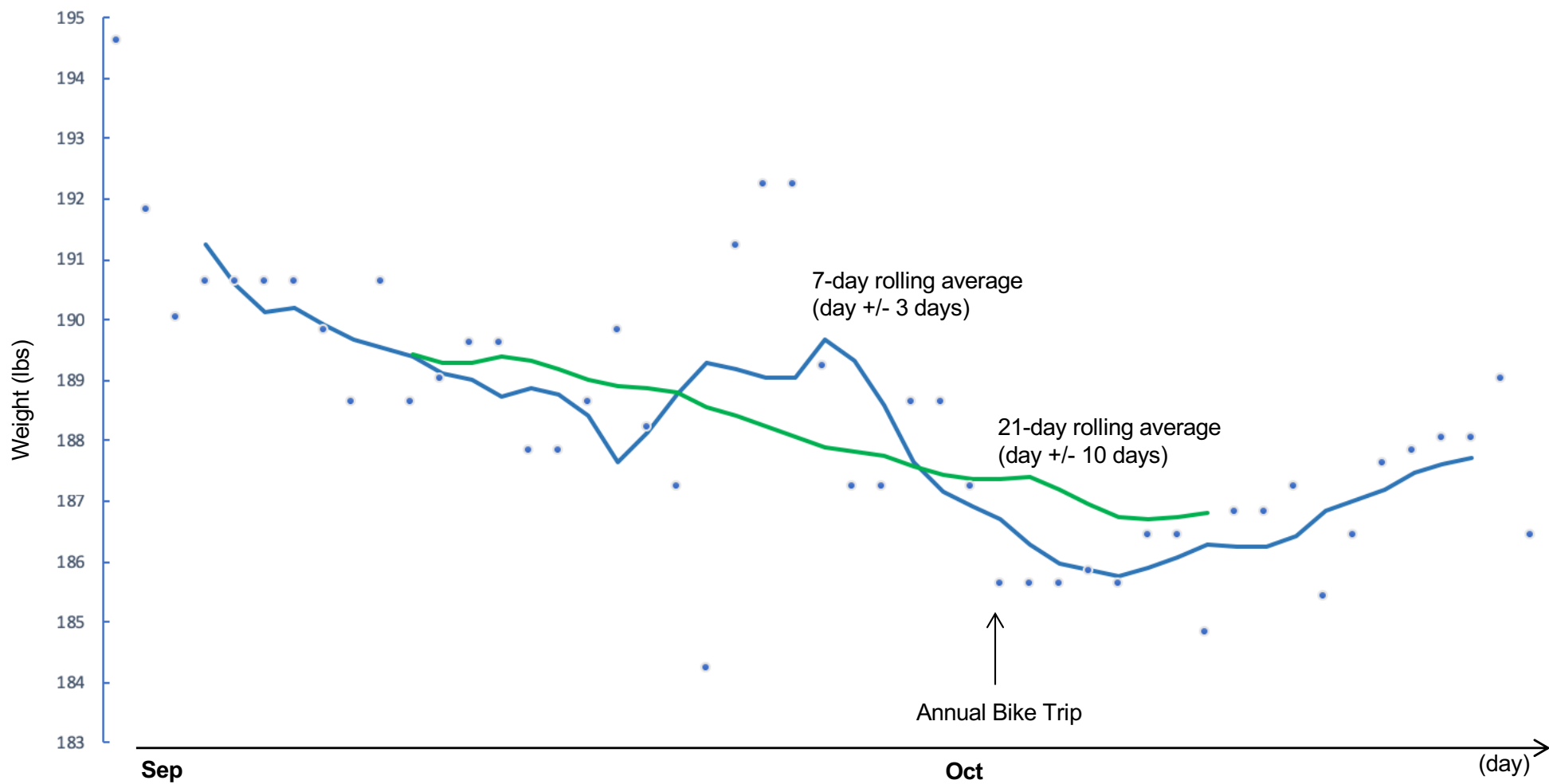


Same 50 points in "line" graph (but since measurement not continuous – only "markers" shown).

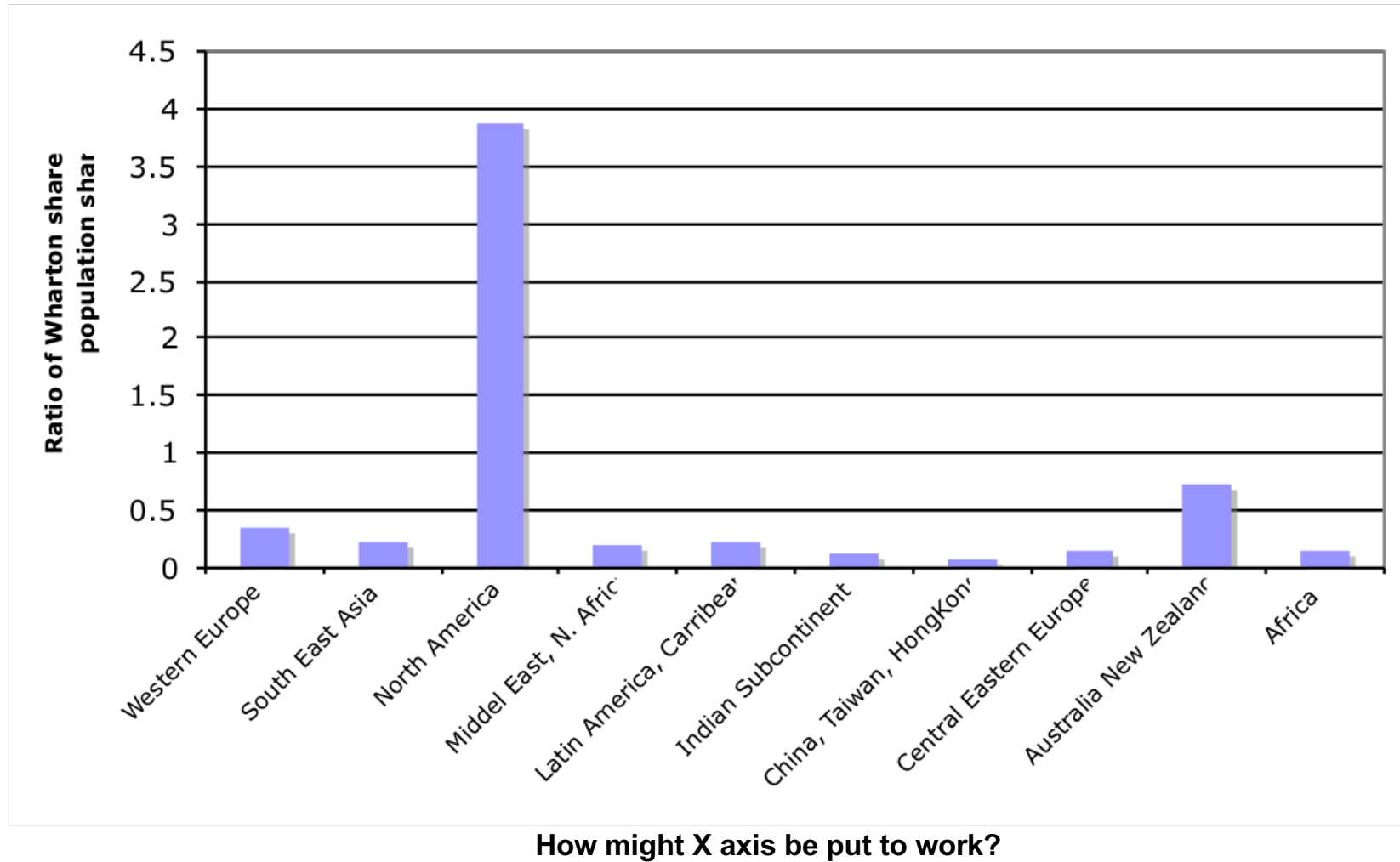
## 6. Careful display of time series (use of rolling averages to detect real trends)



## 6. Careful display of time series (annotation to support discussion)



## 7. Make all X and Y dimensions meaningful

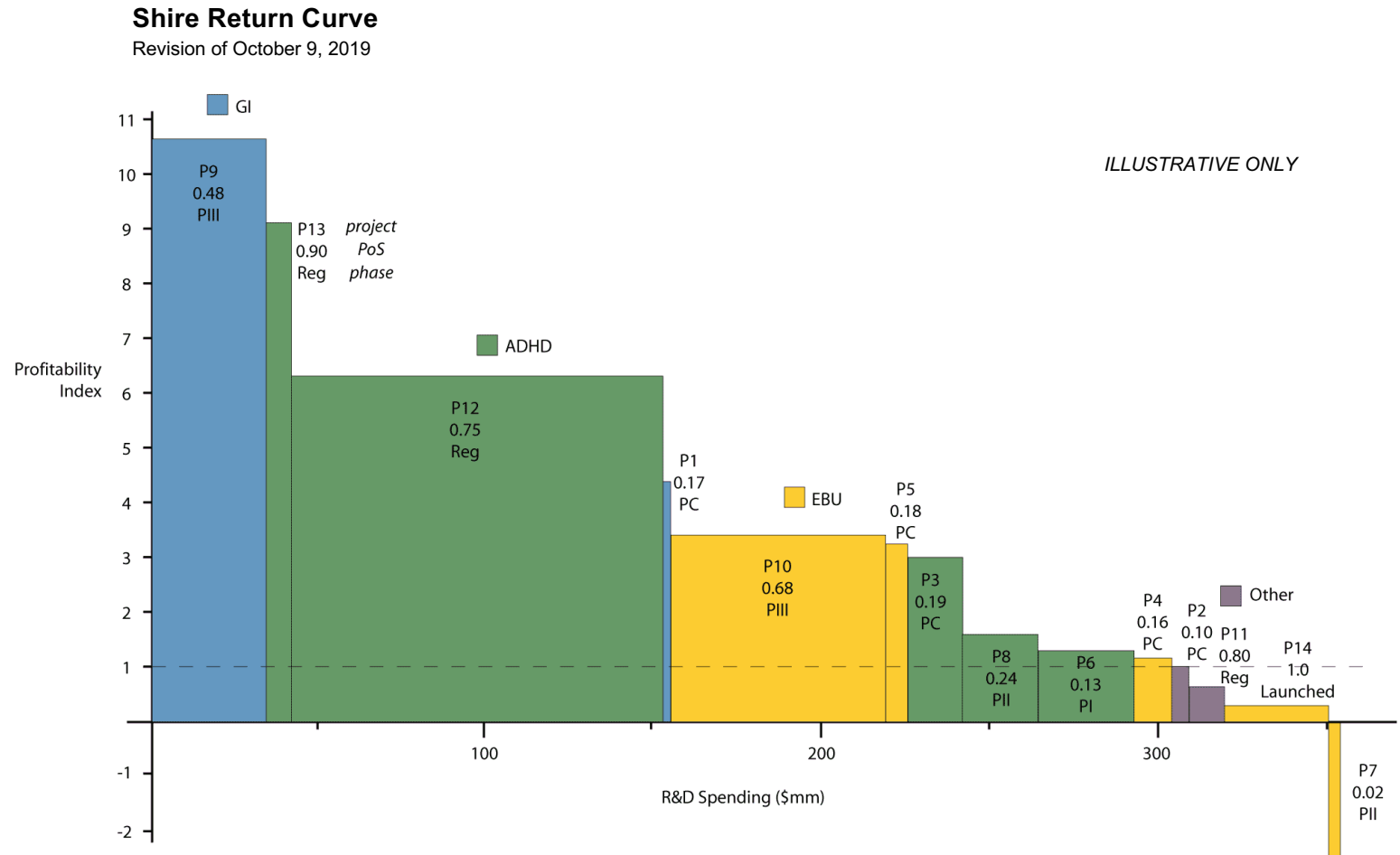


Source: New York Times, 2011




## 8. Data Graphics Design Hygiene

- Eliminate chart chunk.
- Maximize data-pixels/non-data-pixels ratio.
- Careful use of color.
- Include your name and the date.

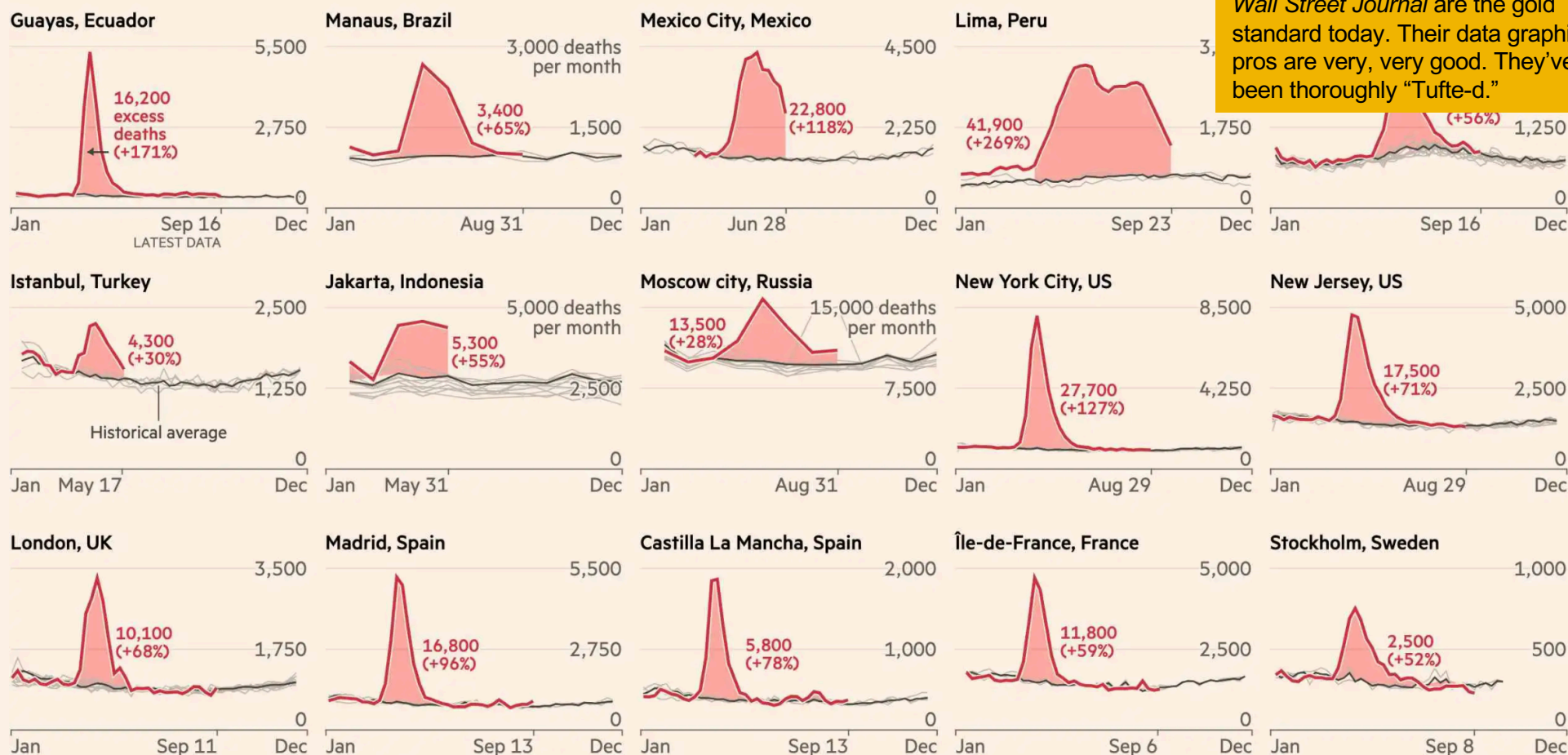


$\text{Profitability Index} = \text{PV}(\text{expected profit contribution}) / \text{investment} \sim (e\text{NPV} + R\&D\text{Spend}) / R\&D\text{Spend}$

## Mortality rates have soared in urban areas worldwide, with overall excess deaths much higher than reported Covid-19 counts

Number of deaths per week from all causes, 2020 vs recent years:  Shading indicates total excess deaths during outbreak

The *New York Times*, *FT* and *The Wall Street Journal* are the gold standard today. Their data graphics pros are very, very good. They've been thoroughly "Tufte-d."



Source: FT analysis of national mortality data. Mexico city data from Mario Romero Zavala & Laurianne Despeghe. Figures for Jakarta refer to burials. Data updated September 25

FT graphic: John Burn-Murdoch / @jburnmurdoch

© FT

## Data Graphics Checklist

1. Have you shown the data?
2. Do you have a clear understanding of the reasoning you are trying to support with the graphic?
  - Do the variables and relationships shown support the reasoning?
  - Have you avoided lines connecting unrelated points?
3. Have you enabled comparisons?
4. Have you wasted any visual dimensions (e.g., arbitrary ordering of items in charts)?
5. Have you directly labeled data points (avoiding legends if at all possible)?
6. Have you used scatter plots where appropriate to show two attributes for items?
  - Are the X-Y axes sensible?
7. Did you consider a nicely implemented table when displaying more than two dimensions?
8. Have you used good graphic hygiene?
  - Appropriate font sizes (usually smaller).
  - Avoiding arbitrary use of color.
  - No chart junk.
  - Your name and the date are on the graphic.
  - All axes and units are labeled and/or specified.
  - You have minimized non-data-pixels/ink.

