IIBA Columbus BACon 2024

Raising Your Game Using Model Thinking

Matt Badgley

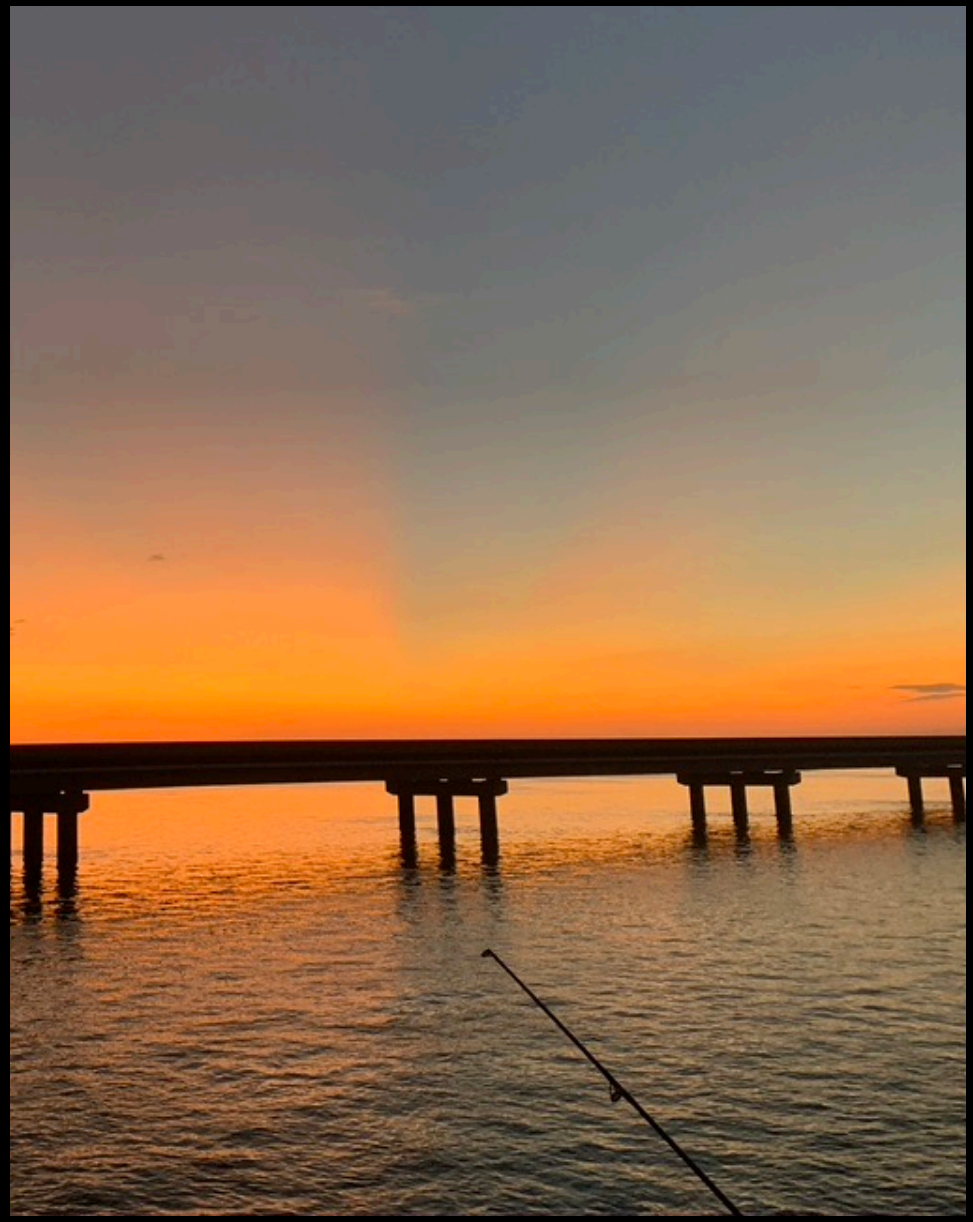
I'm a person that really enjoys helping others make great software, have fun, and discover new ways to innovate. By the way, I like to also hang with my BFFW, fish, do anything with my dogs, enjoy beer, and smoke meat.

I work as a Lean-Agile Coach, Trainer, Leadership Coach, constant learner, and frequent screw-up.

matt@bluhound.com

@bluhoundhowling www.bluhound.com

www.linkedin.com/in/mattbadgley



Let's Try Something

Instructions:

1. If you have a LinkedIn account, ask the person sitting next to you for their LinkedIn account name.
2. How many degrees of separation are they?
3. Repeat this for as many people around you.
4. Count how many people are 1st, 2nd, and 3rd

If you want to check mine, my LinkedIn account is:
https://www.linkedin.com/in/mattbadgley/

Six Degrees of Separation

Network Model based on Stanley Milgram's 1960's experiment which demonstrated that most people are connected by six-degrees of separation or less.

Formula Example:

- 100 clique friends (C), all of whom are friends with one another, and 20 random friends (R) who have no friends in common with the node.
  - Degree One: C+R = 120
  - Degree Two: CR+RC+RR = 4400
  - Degree Three: CRC+CRR+RCR+RRC+RRR = 328,000
  - Degree Four: $17,360,000^{13}$
  - Degree Five: > 1 billion
  - Degree Six: > 20 billion

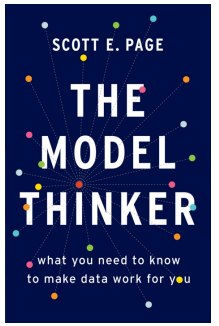
What is Model Thinking?

Models are formal structures represented in mathematics and diagrams that help us to understand the world.

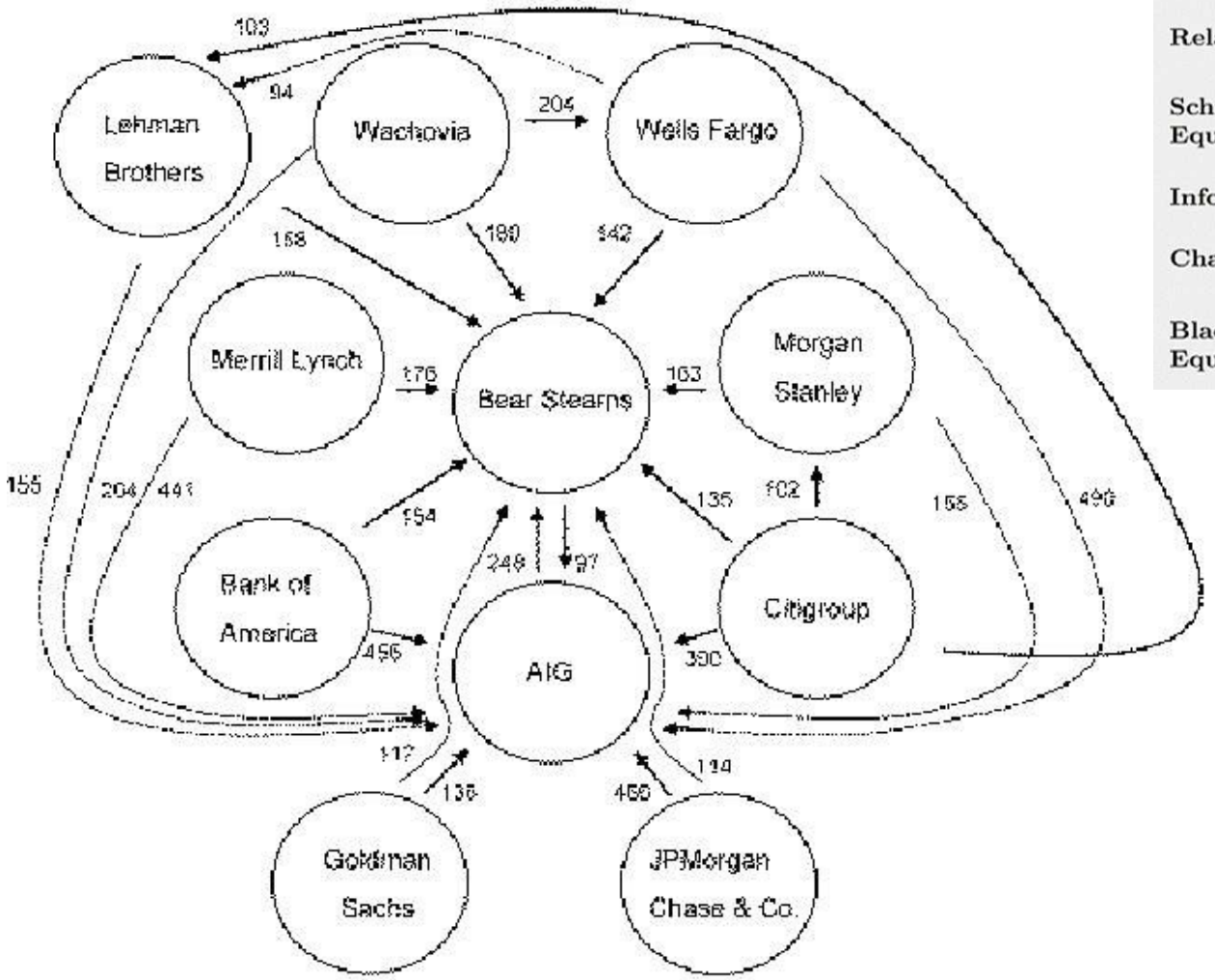
“Models help us simplify or make sense of a complex world”

“All models are wrong”

Scott E. Page



Types of Models



Sources: Bloomberg, L.P.; Primark Datastream; and IMF staff estimates.
Note: This diagram presents the conditional co-risk estimates between pairs of selected financial institutions. only co-risk estimates above or equal to 90 percent are depicted.

Maxwell's Equations	$\nabla \cdot \mathbf{E} = 0 \quad \nabla \cdot \mathbf{H} = 0$ $\nabla \times \mathbf{E} = -\frac{1}{c}\frac{\partial \mathbf{H}}{\partial t} \quad \nabla \times \mathbf{H} = \frac{1}{c}\frac{\partial E}{\partial t}$	J.C. Maxwell, 1865
Second Law of Thermodynamics	$dS \geq 0$	L. Boltzmann, 1874
Relativity	$E = mc^2$	Einstein, 1905
Schrodinger's Equation	$ih\frac{\partial}{\partial t}\Psi = H\Psi$	E. Schrodinger, 1927
Information Theory	$H = -\sum p(x) \log p(x)$	C. Shannon, 1949
Chaos Theory	$x_{t+1} = kx_t(1 - x_t)$	Robert May, 1975
Black-Scholes Equation	$\frac{1}{2}\sigma^2 S^2 \frac{\partial^2 V}{\partial S^2} + rS\frac{\partial V}{\partial S} + \frac{\partial V}{\partial t} - rV = 0$	F. Black, M. Scholes, 1990

What do Models do for us?

Reason To identify conditions and deduce logical implications

Explain To provide testable explanations to empirical phenomena

Design To choose features of institutions, policies, and rules

Communicate To relate knowledge and understandings

Act To guide policy choices and strategic actions

Predict To make numerical and categorical predictions of future and unknown phenomena

Explore To investigate possibilities and hypotheticals

Source: Scott E Page, The Model Thinker

Exercise

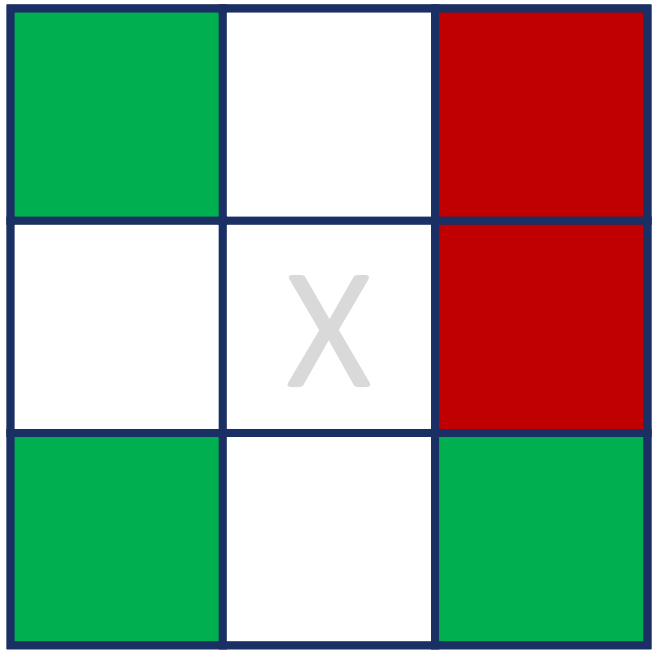
- 9 Volunteers to stand on one of the blank pieces of paper
- Pick a color, between ”Red” and “Green” paper – hold the one you picked above your head

Example – Schelling's Segregation Model

Individuals, each of whom has a type A or B, are randomly arranged on a checkerboard with room for open spaces. Each person has a tolerance threshold, and relocates to a random new location if the percentage of people of their same type drops below their threshold.

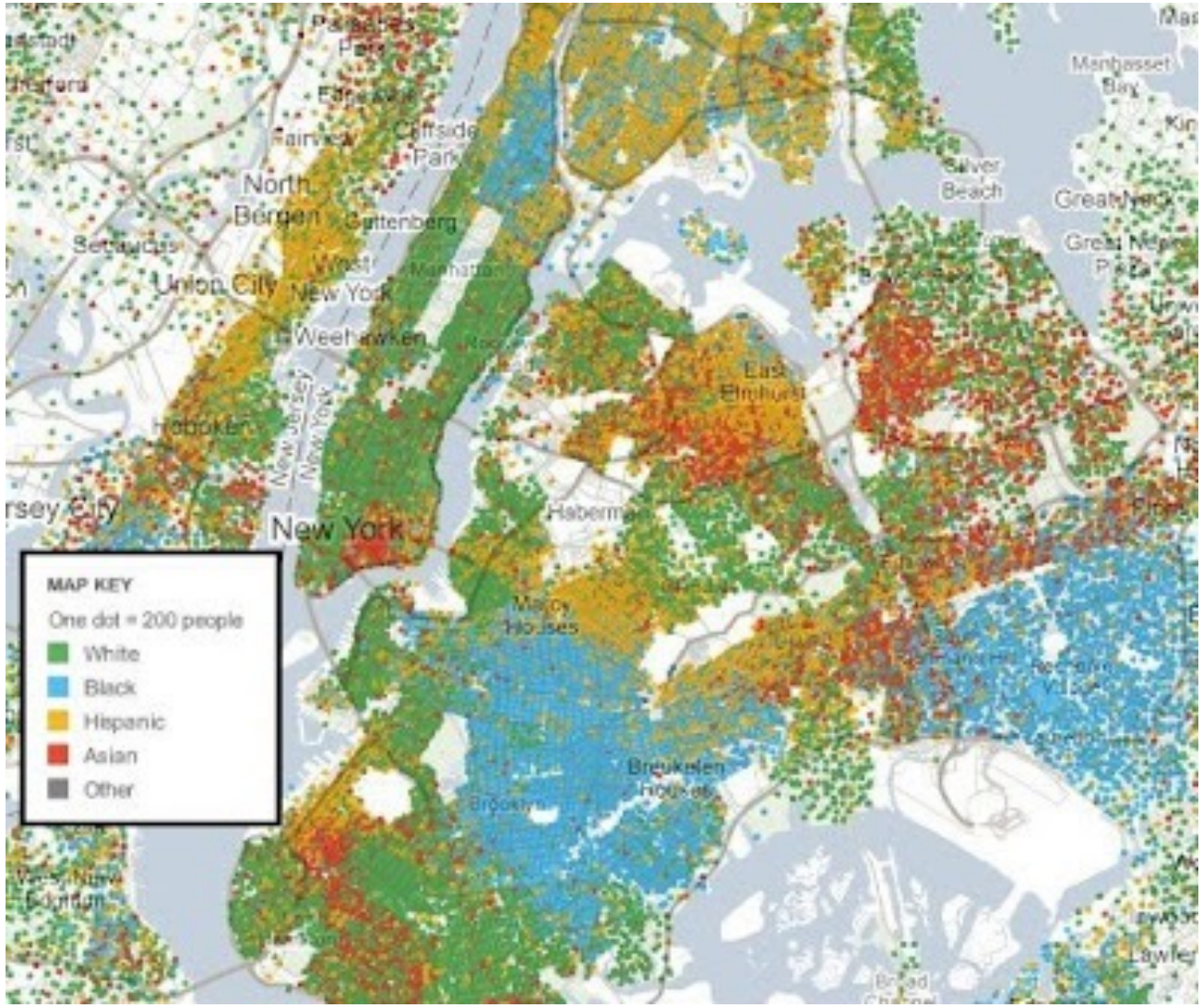
= Type A

= Type B

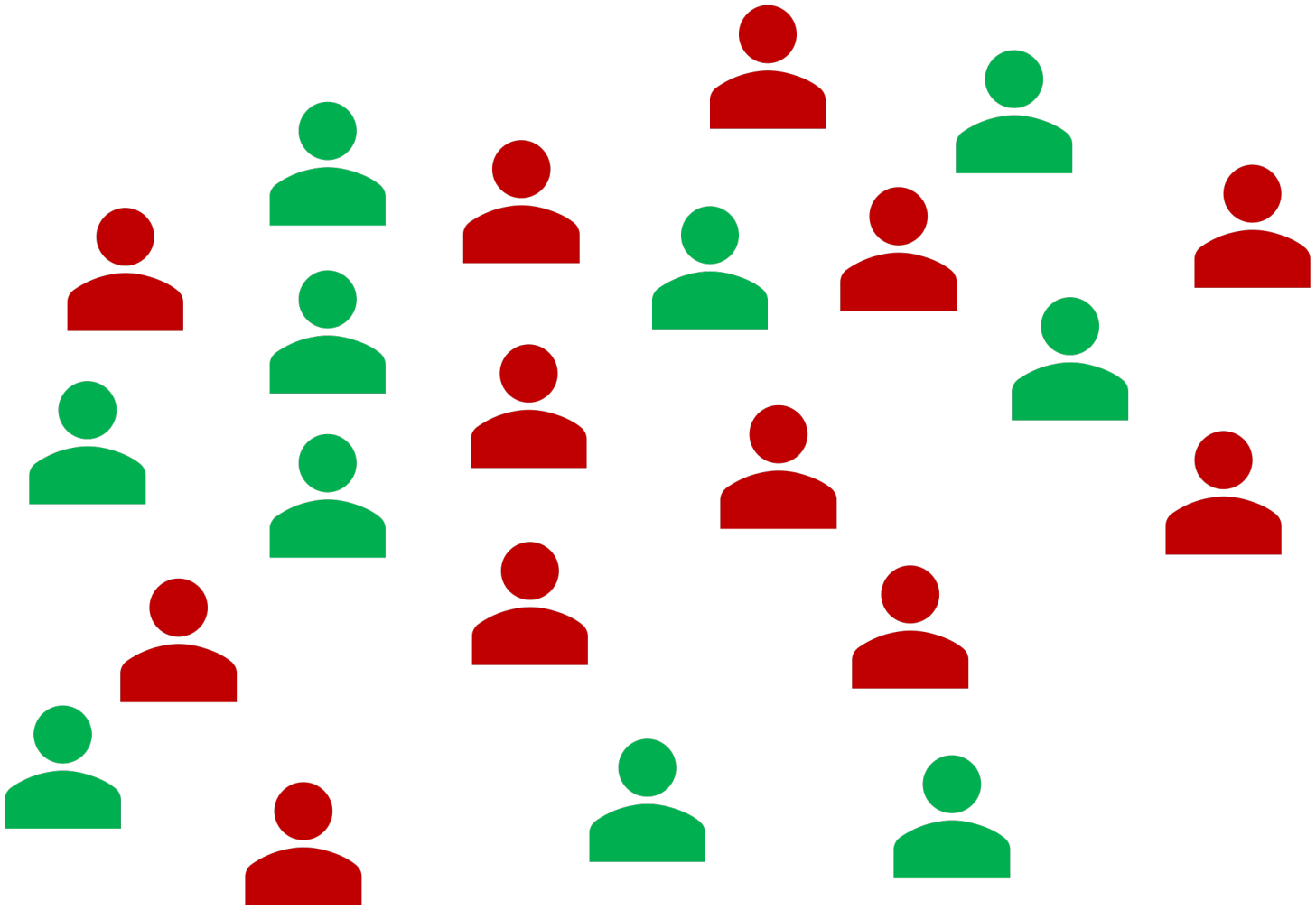


Threshold = 33%

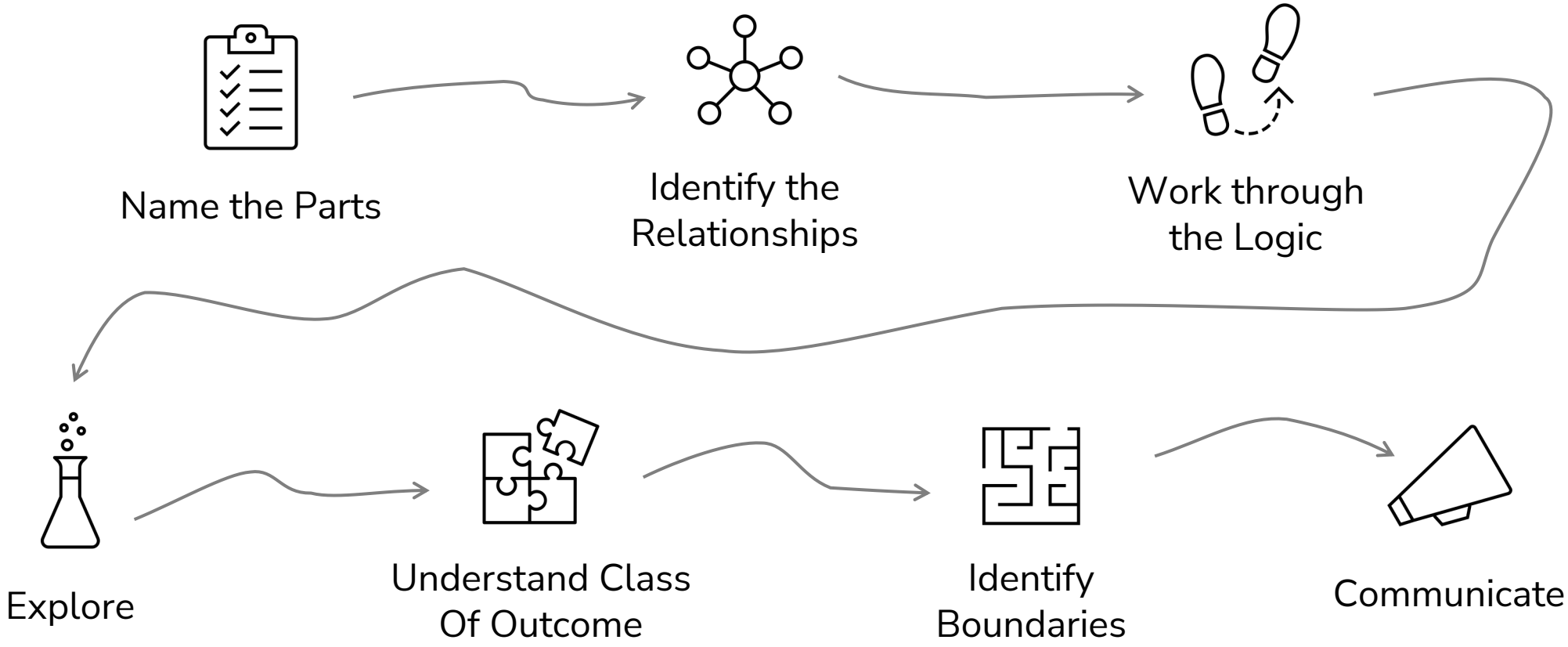
Example – Schelling's Segregation Model



Enabling Change



Steps to Construct a Model



Use Multiple Models

Does it seem like your team gets buried with unplanned work?

What's the impact of unplanned work?

Risk Threshold is > 6 unplanned

Sprint	# of Planned	# of Unplanned	% of Planned Done	Goals Met
1	25	12 48%	60%	No
2	27	8 29%	75%	No
3	24	4 17%	85%	Yes
4	26	9 35%	80%	No
5	28	6 21%	82%	Yes
6	25	3 12%	88%	Yes
7	23	7 30%	78%	No

Risk Threshold is > 21% unplanned/planned

Probability of Goals met is 75% when Planned Done 8X%

Understand the Unplanned

Step 1 - Define Categories of Unplanned Work

Step 2 – Track the Unplanned Work

Step 3 – Understand the driver of the chaos

	45% Incidents	14% Late Feedback	14% Uncovered Requirements	27% Help Requests
Sprint 1	6	1	2	3
Sprint 2	3	3	0	2
Sprint 3	2	0	0	1
Sprint 4	4	2	2	1
Sprint 5	2	0	2	2
Sprint 6	2	0	0	1
Sprint 7	3	1	1	2

Does your organization struggle with prioritization?

Let's Start with the HIPPO

Preference Models

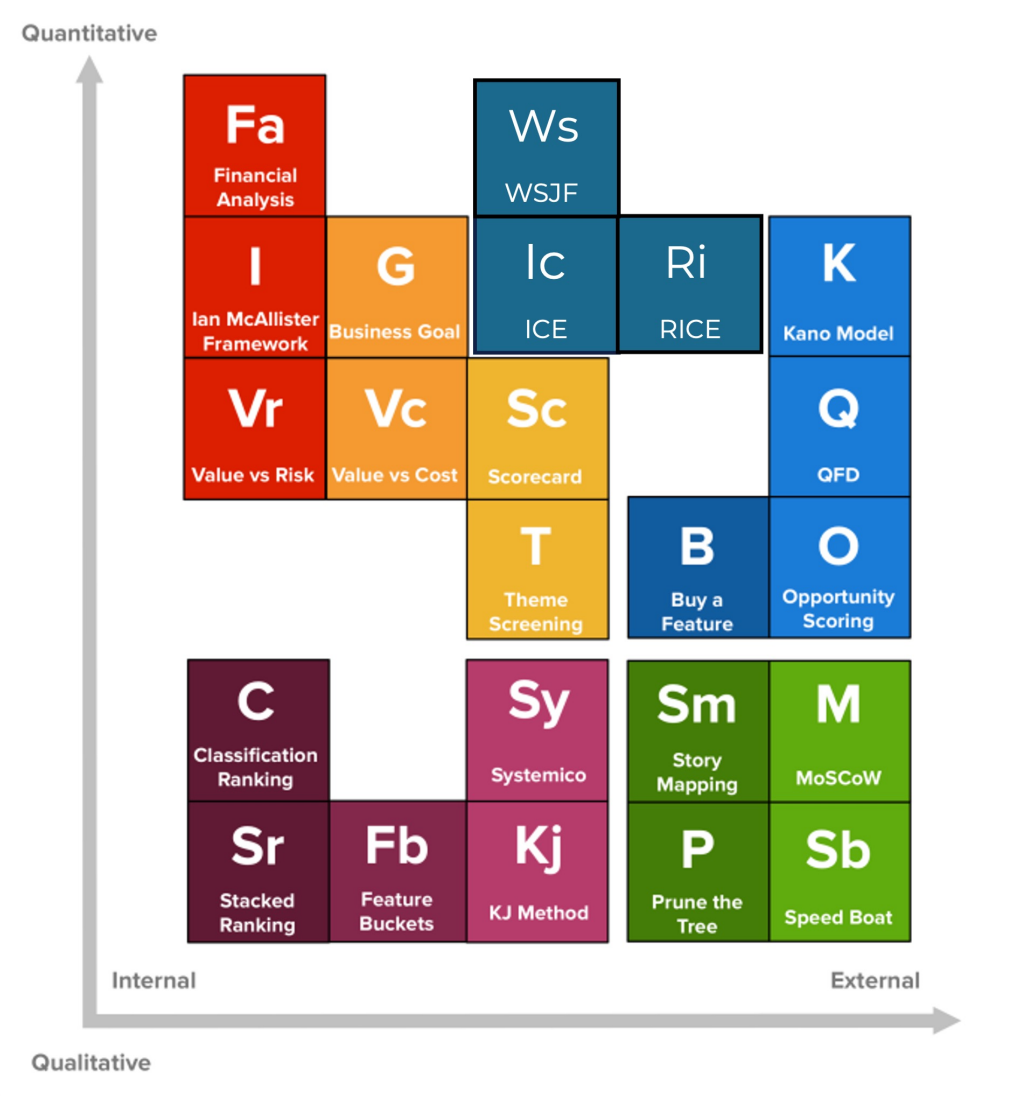
Condorcet Jury Theorem

Transitive vs. Non-Transitive

Attribute	Feature 1	Feature 2	Feature 3	HIPPO
Addresses Compliance	1 .2	8 1.6	3 .6	20%
Improves Call Center Response Time	13 3.9	5 1.5	8 2.4	30%
Addresses Quality of Service	5 .75	8 1.2	13 1.95	15%
Enables Revenue	8 2.4	3 .9	5 1.5	30%
Creates New Ways of Working	8 .4	5 .15	3 .15	5%

34 7.65 29 5.35 32 6.6

What are other models that exist?

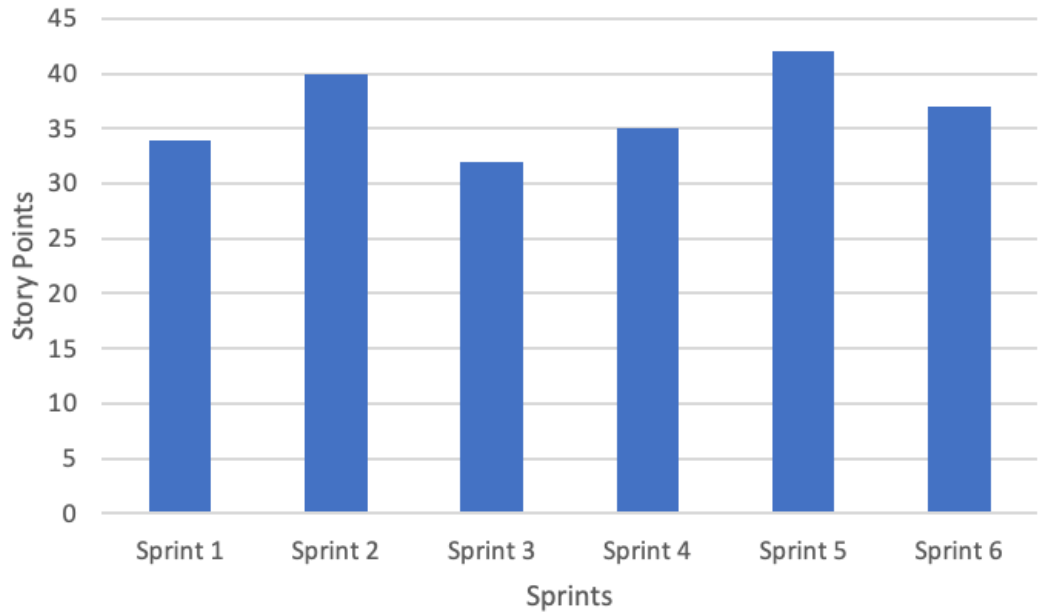


Source: www.FoldingBurritos.com

Does every metric make you a little uneasy?

Velocity

At the end of each iteration, the team adds up effort estimates associated with user stories that were completed during that iteration. This total is called ~~velocity.~~ speed



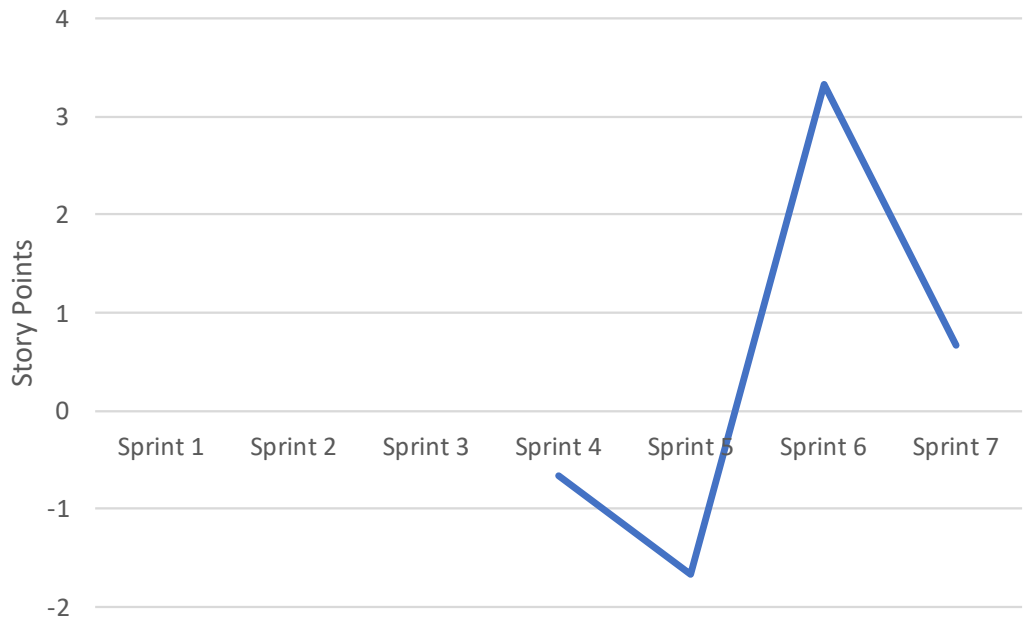

```
speed = distance/time
```

Source: Agile Alliance, https://www.agilealliance.org/glossary/velocity

Really, then what is velocity?

Velocity is a vector **measurement of the rate of motion** of an object **and the direction** in which it is moving.

$$\texttt{average velocity} = \Delta\,\texttt{speed} \;/\; \Delta\,\texttt{time}$$



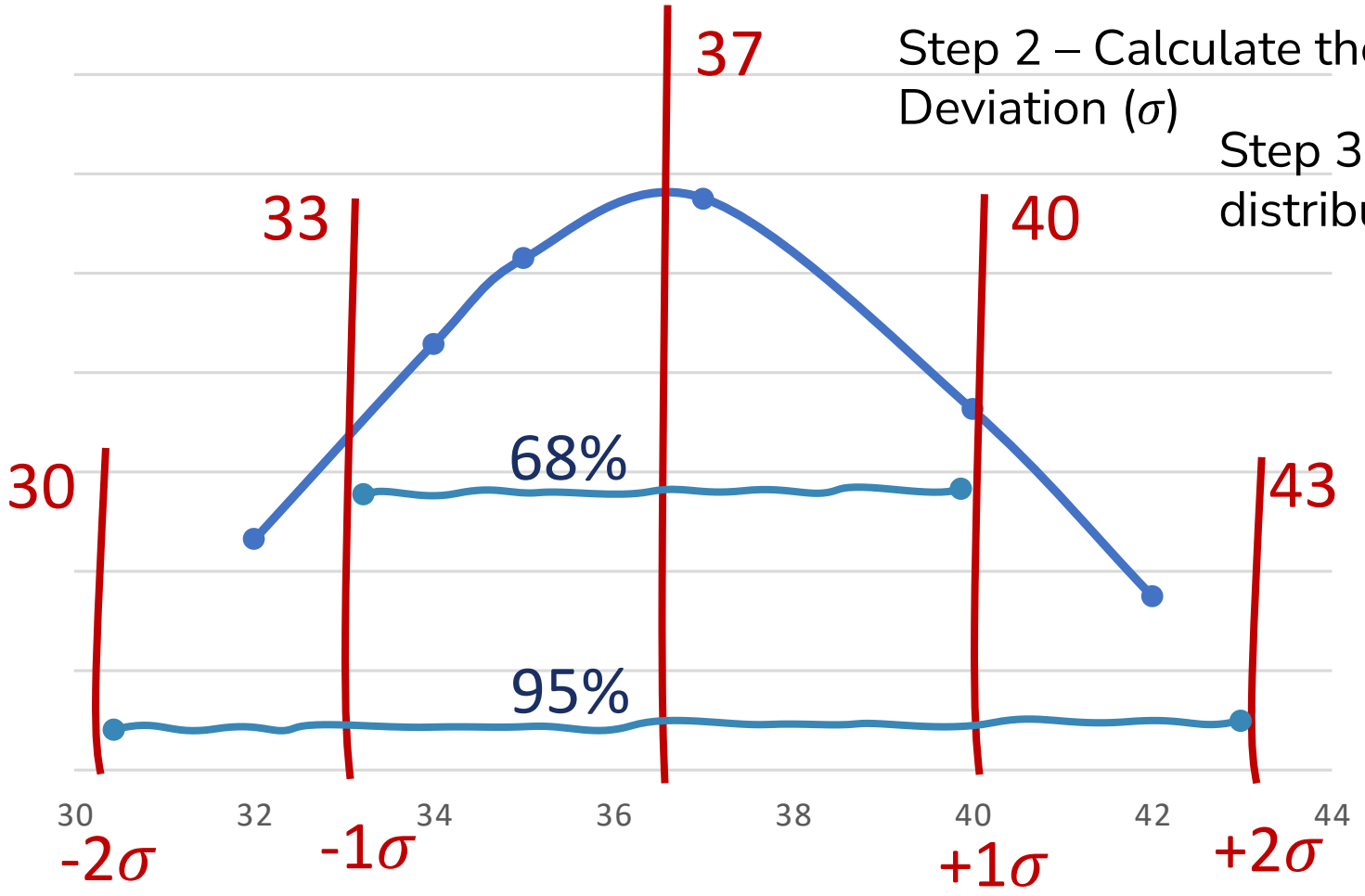
Even Better Velocity for Planning

Using the **Central Limit Theorem** …

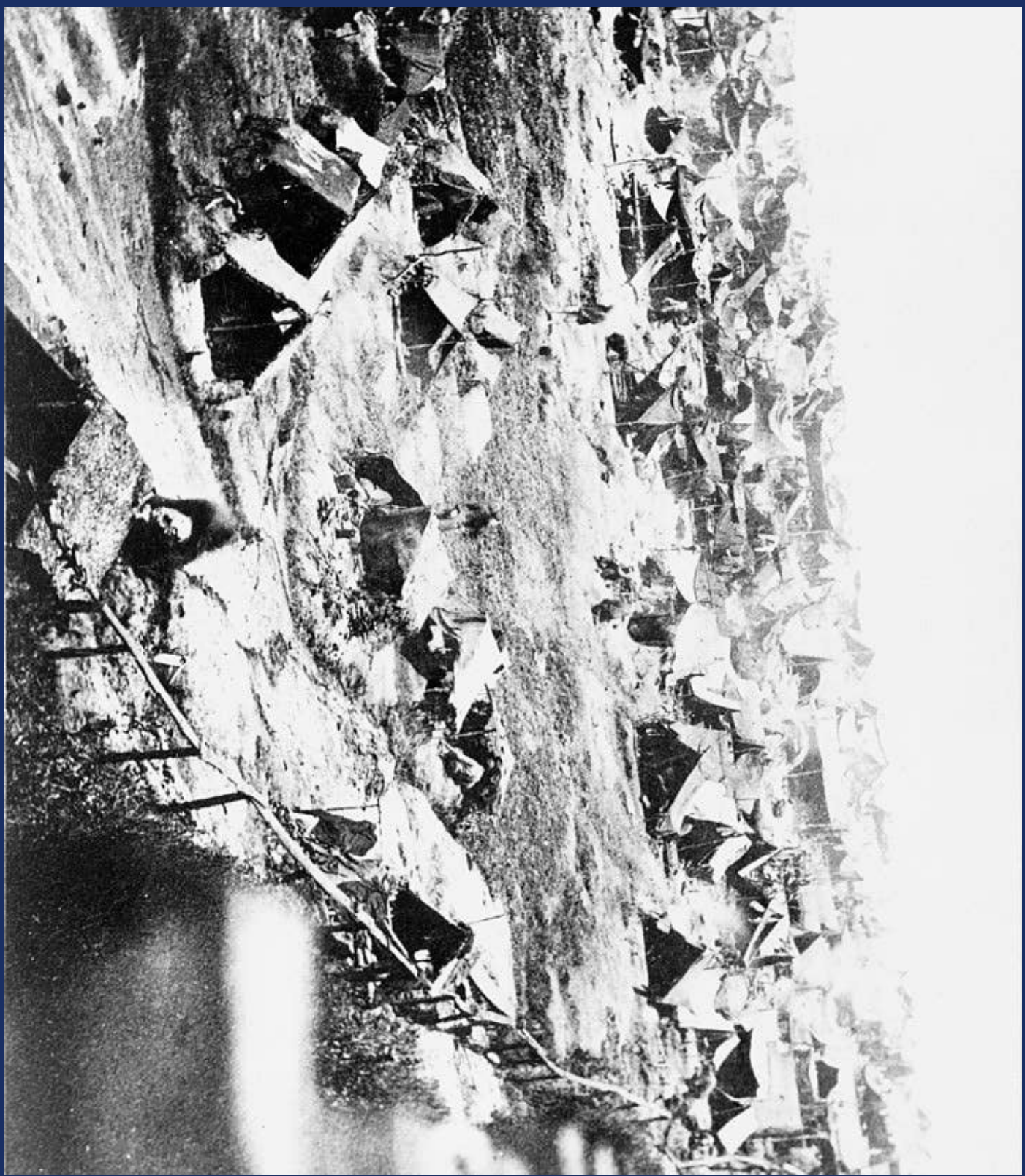
Step 1 – Calculate the Mean

Step 2 – Calculate the Standard Deviation (σ)

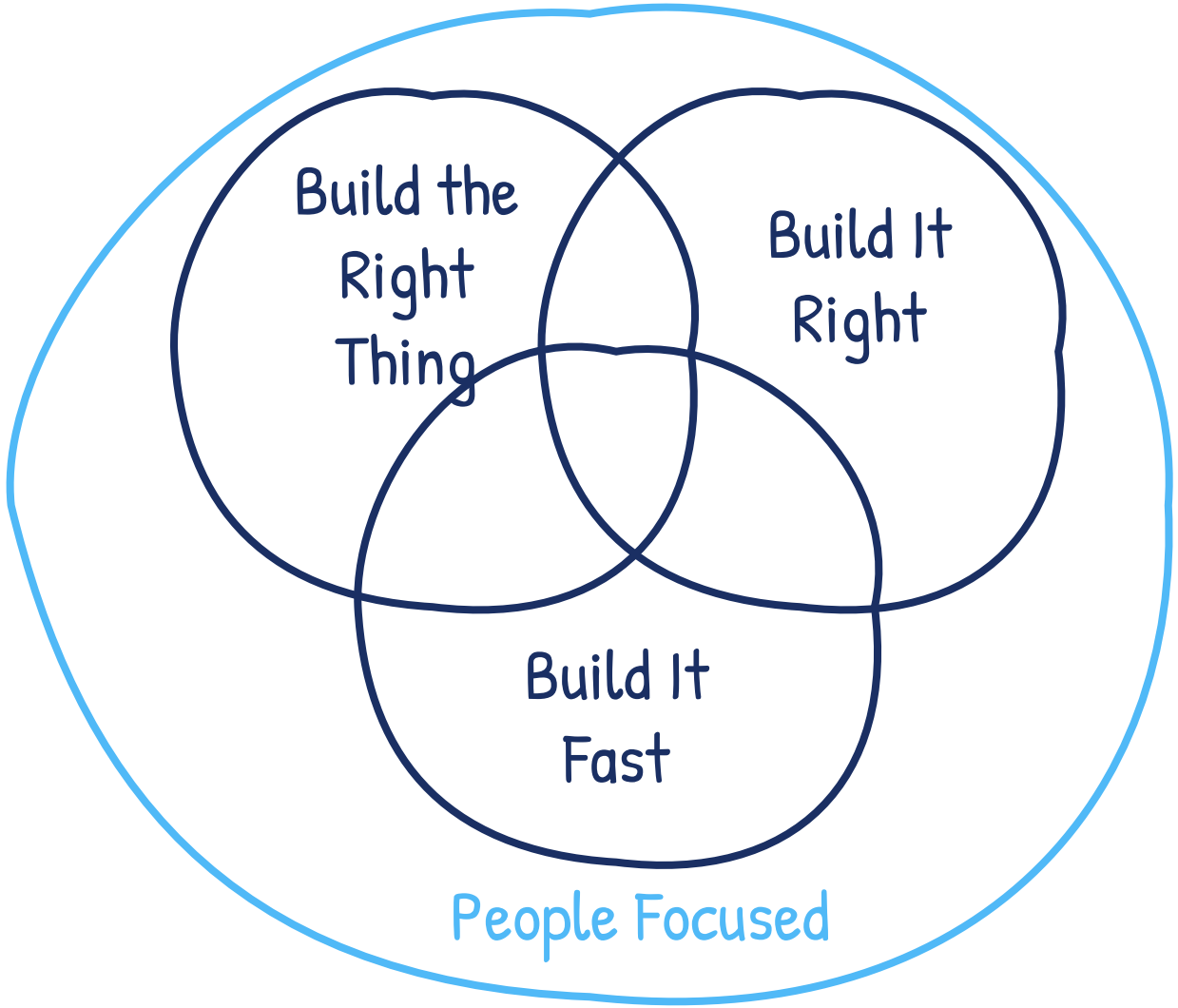
Step 3 – Plot normal distribution (optional)



Is Predictability simply a long word?



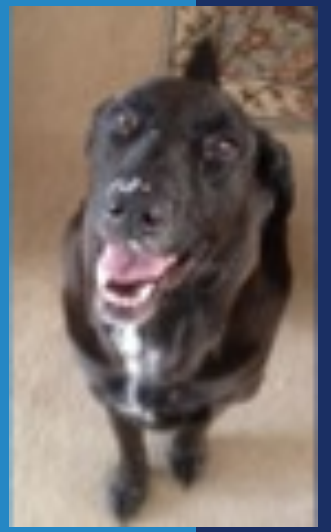
Practice Metrics Safely



Thank You

If you would like this presentation, shoot me an email at **matt@bluhound.com**

Blu says, "Please support your local humane society or favorite pet adoption group."



Please connect with me:
matt@bluhound.com
https://www.linkedin.com/in/mattbadgley/