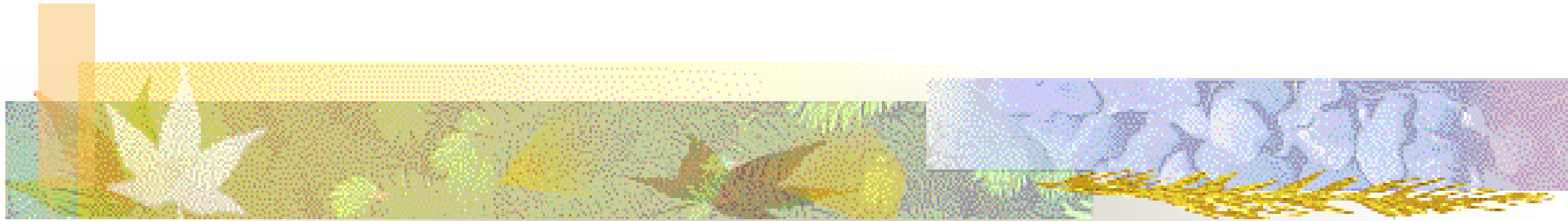# Experiments: the Good, the Bad, and the Beautiful

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A short survey

How many are doing some flavor of Agile?

How did your organization decide to do that?

How many looked at the randomized, controlled studies that provided evidence that Agile was better than your current process?

Not much science

- **The short history of software is not progress based on scientific experiments.**

- **Instead we jump on the latest bandwagon because we hear a good story.**

- **These are not even really case studies.**

- **The plural of anecdote is not data ☺!**

Aren't we experimenting?

- "Experiment" for most organizations really means "try."

- No clear hypothesis, just an idea to try.

- No randomization. Usually those who participate are enthusiastic believers.

- No control group, just the memory of the way things were.

- No analysis, perhaps some easy-to-measure attributes or good "feelings."

How about A/B Tests?

- A/B tests could be scientific, but usually aren't.

- No clear hypothesis, just a couple of different ways to do something.

- Results don't build toward a theory or real learning.

- Results are context-sensitive and may not apply elsewhere.

How about saying "trial"?

We don't have resources for one, let alone repeated, experiments that good science requires.

Just "try" is our best hope. *Trial Run* is a pattern ☺!

Why do trials?

- **Answer: To "prove" something**

- **Problem: One trial "proves" little or nothing, especially if treatment is not randomized or controlled. Even in science, "proof" is rare and temporary.**

- **"Once and done" doesn't work. We need lots and lots of trials.**

Even scientists are biased

Drug trials are now "double-blind" because it was discovered that if researchers and doctors knew which patients were getting the "real" treatment, that would change the outcome.

AND…the placebo effect…

What CAN we do?

- **Many small, simple, fast, frugal trials.**

- **Vary contexts, number of participants, degree of enthusiasm, kind of project.**

- **Keep "try"ing. Keep learning.**

Why Small?

- **Huge experiments leave no room for failure. Use small, frugal trials that barely register if they don't work out as hoped.**

- **Get rid of the notion of failure – replace it with learning.**

- **Keep asking, "Can we make it even smaller?"**

Why Simple?

- **Everyone feels safe to try something that might bring benefit.**

- **Encourage each other to try!**

- **Keep asking, "Can we make it even simpler?"**

Why Fast?

Establish a standard of fast, frequent, and inexpensive experimentation. Assume that many of your experiments will fail. One of the most common phrases you'll hear at Menlo is "Let's run the experiment." We are apt to say that at least once a day. We don't count experiments and we don't track success/failure rates, but if we did, we would look for success and failure rates to be about even. If the percentage of failures started dropping, we'd become concerned that fear had crept into the room and that people weren't taking enough risks.

Rich Sheridan, Co-founder and CEO of Menlo Innovations

Why Frugal?

- **To counter the sunk-cost fallacy. It's surprising how little an investment it takes to get us to avoid "wasting" that effort.**

- **Keep asking, "Can we make it even cheaper?"**

Why Time-Box?

- **Begin with the end in mind - Stephen Covey**

- **Encourages openness and a way around cognitive bias: "Let's try having the stand-up at 10 am instead of 8 am for the NEXT TWO WEEKS and see if attendance is better and we get more done in the morning."**

Why do trials?

- **Answer: To show "those people"**

- **Problem: Research shows that evidence/data is not convincing and will be filtered to bolster our own beliefs (confirmation bias and backfire effect)**

Better ways to convince

- **Include others in trials – encourage sharing**

- **Use patterns from *Fearless Change:***

- ***Involve Everyone* – use the trial to draw others in – watch your language – more "us" and less "them"**

- ***Hometown Story* – share results and encourage everyone to tell their stories**

Why do trials?

- **Answer: To solve a problem.**

- **Problem: Intervention in a complex system tends to create unanticipated and often undesirable outcomes.**

To change a complex system

- **Probe, Sense, Respond**
- **"On Understanding Software Agility: A Social Complexity Point of View" Joseph Pelrine**
- **Stop looking for THE answer.**
- **Instead, uncover ideas for more trials.**

Uncertainty

- **We don't know what we don't know (thank you, Donald Rumsfeld)**

- **Experiments involve risk and uncertainty—no wonder we don't do them ☺!**

- **Prepare to be surprised ☺!**

Alexander Fleming said, "That's funny!"

…and we weren't even trying for that!

"Thank God it's Open Friday," Corinna Baldauf at Sipgate

Why do trials?

- **Answer: To convince management**

- **This makes sense! BUT have your ducks in a row.**

Presentations to management

- Easy to follow, easy to understand, easy to share, easy to believe.

- No extraneous complications or technical jargon.

- Good ideas can crash and burn because more thought wasn't put into the presentation.

- Less emphasis on details. More on communicating strategic value. Not about failure, about learning.

- Executives should ask, "Why haven't we thought of this in that way before?"

- *The Innovator's Hypothesis*, Michael Schrage

Benefits of trials

You kill off the HiPPOs. (Highest Paid Person's Opinion.) Testing is a sure way to get to the bottom of a decision without relying on anyone's gut instinct. At Shutterstock, if a senior executive has an idea in a meeting, the response is simply "Let's test it."

Wyatt Jenkins, VP of Product Development

Confirmation bias

Our tendency to search for, interpret, favor, and recall (yes, it affects memory) information to confirm our beliefs.

Charles Darwin said that whenever he ran into something that contradicted a notion he cherished, he wrote down the new finding within 30 minutes. Otherwise his mind would start to work to reject the discordant information, much as the body rejects transplants. Man's natural inclination is to cling to his beliefs, particularly if they are reinforced by recent experience. – Warren Buffet

Believing is seeing

- We begin an experiment with the result we want to , then confirmation bias kicks in, so it's difficult to be objective about the results.

- Once we have a belief, we only see the information that will confirm that belief. We stop seeing what we don't want to see.

Cognitive dissonance

- It's difficult for us to hold two contradictory ideas at the same time.

- To truly test each hypothesis, we have to be open to showing that we might be wrong.

This bias is challenging!

…because the scientific method is designed to create dissonance…one of the reasons science is so difficult—because scientists are humans, even scientists don't like it when their predictions are disconfirmed.

I wish for every student that something they deeply hold to be true is shown to be wrong. Once you've had that experience, then you get it; then you get what science is about. - Lawrence Krauss

Some help for biases

- **Talk out loud and use words like 'rational,' 'scientific' and 'experiment.' Say, "Most people want to overcome their biases."**

- **Write -- on paper, white board, flip chart**

- **Diversity – include skeptics – listen to all contributors**

- **Be aware and alert for bias -- ask questions**

- **Slow down. Take a break. Get enough sleep.**

Correlation is not causation

Honolulu Heart Program: 8,004 men studied over 30 years, examined relationship between coffee intake and the incidence of Parkinson's. Men who drank the most coffee were least likely to get Parkinson's.

Now we know that there's a genetic connection between liking coffee and risk for Parkinson's. It's not that coffee prevents the disease. It's that not liking coffee is a consequence of risk for the disease.

In a disagreement

Instead of arguing and taking up valuable meeting time, ask…

"What small, simple, fast, frugal trial would help us answer this question?"

Other benefits

If you are careful in framing your hypotheses and in designing your trials, you will get better over time. This is yields other great results – the experimenters themselves – and an environment of replacing argument and endless discussion with 'trials' – a culture of experimentation ☺!

Reading suggestions

The WHY Axis, Uri Gneezy & John List

Innovator's Hypothesis, Michael Schrage

Little Bets, Peter Sims

Fearless Change & More Fearless Change, Manns & Rising

Anything by Dan Ariely

Thinking Fast and Slow, Daniel Kahneman

Mistakes Were Made (But Not by Me), Carol Tavris & Elliot
     Aronson

Joy, Inc., Richard Sheridan

Check this out

Behavioral Insights Team, "Test, Learn, Adapt"

http://www.behaviouralinsights.co.uk/

Just "Try" It!

- **Start running your own trials!**
- **Have fun!**
- **Think like a child!**
- **Adopt this new way of learning!**
- **Thanks for listening!**