Moneyball and the Science of Building Great Testing Teams

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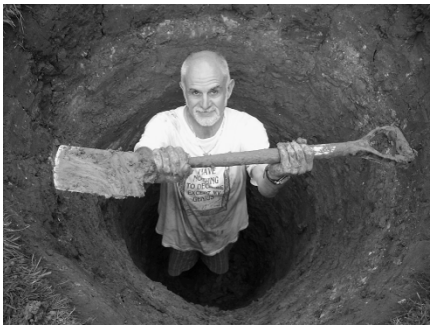
Moneyball is About Baseball

But It's Also About Building Great Teams

Oakland Had a Problem

- There are rich teams and there are poor teams, then there's fifty feet of crap, and then there's us.



How Do You Build Great Teams?

- Baseball experts didn't know a number of things
  - Getting on base is highly correlated with winning games
  - Pitching is important but not a game-changer
  - Fielding is over-rated
- In general, data wins out over expert judgment
  - Bias clouds judgment

What Does This Have to Do With Testing?

- We maintain certain beliefs in testing practice
  - Which may or may not be factually true
- That bias can affect our testing results
- How do bias and error work?
  - We may be predisposed to believe something
  - That affects our work and our conclusions

Let's Consider Human Error

- Thinking, Fast and Slow – Daniel Kahneman
  - System 1 thinking – fast, intuitive, and sometimes wrong
  - System 2 thinking – slower, more deliberate, more accurate

Consider This Problem

- A bat and ball cost $1.10
- The bat cost one dollar more than the ball
- How much does the ball cost?

Where Does Error Come In?

- System 1 thinking keeps us functioning
  - Fast decisions, usually right enough
  - Gullible and biased
- System 2 makes deliberate, thoughtful decisions
  - It is in charge of doubt and unbelieving
  - But is often lazy
  - Difficult to engage

Where Does Error Come In?

- What are the kinds of errors that we can make, either by not engaging System 2, or by overusing it?
  - Priming
  - Halo effect
  - Heuristics
  - Regression to the mean

The Role of Priming

- System 1 can be influenced by prior events
  - How would you describe your financial situation?
  - Are you happy?
- People tend to be primed by the first question
  - And answer the second based on financial concerns

The Role of Priming

- If we are given preconceived notions, our instinct is to support them
  - We address this by limiting advance advice/ opinions
- "They were primed to find flaws, and that is exactly what they found."

The Halo Effect of Thinking

- Favorable first impressions influence later judgments
  - We want our first impressions to be correct
  - Provides a simple explanation for results
- Cause and effect get reversed
  - A leader who succeeds is decisive; the same leader who fails is rigid

The Halo Effect of Thinking

- Controlling for halo effects
  - Facts and standards predominate
  - Resist the desire to try to explain

The Role of Heuristics

- We unconsciously form rules of thumb
  - That enable us to quickly evaluate a situation and make a decision
  - No thinking necessary
- System 1 in action

The Role of Heuristics

- Sometimes heuristics can be incomplete or even wrong
  - And we make mistakes

The Anchoring Effect

- Expectations play a big role in results
  - Suggesting a value ahead of time significantly influences our prediction
  - It doesn't matter what the value is

12345
67890

Regression to the Mean

- We seek causal reasons for exceptional performances
  - But most of the time they are due to normal variation

Regression to the Mean

- "When I praise a good performance, the next time it's not as good."
- "When I criticize a poor performance, it always improves the next time."
- But achievement = skill + luck
  - Praise or criticism for exceptional performances won't help

Regression to the Mean

- But we believe in the value of experts
  - Even when those experts are often wrong
- And we discount algorithmic answers
  - Even when they have a better record than experts
- We take credit for the positive outcome
  - And discount negative ones

Regression to the Mean

- Are expertise and expert intuition real?
- Yes, under certain circumstances
  - A domain with largely unchanging rules and circumstances
  - Years of work to develop expertise
- But even experts often don't realize their limits

And About Those Statistics

- We don't believe they apply to our unique circumstances!
- We can extrapolate from the particular to the general
  - But not from the general to the particular

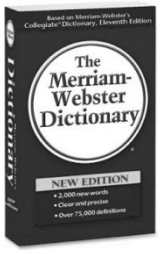
Thinking About Testing

Thinking About Testing

- We don't know the quality of an application
- So we substitute other questions
  - Number and type of defects
  - Performance or load characteristics

Thinking About Testing

- Those we can answer
  - But do they relate to the question on quality?
- It depends on our definition of quality
- We could be speaking different languages
  - Quality to users may be different



Thinking About Testing

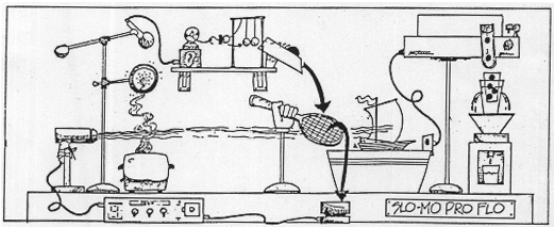
- With simple rote tests, System 1 is adequate
  - The process is well-defined
- Exploratory testing engages System 2
  - Exploratory testing is a good change of pace
  - Too much exploratory testing will wear you out

Lessons to Testing

- Recognize and reduce bias
  - Preconceived expectations of quality will influence testing
  - Even random information may affect results

Lessons to Testing

- Automation is more than simply an ROI calculation
  - It reduces bias and team errors
  - Workflow, test case execution, and defect tracking can especially benefit



Lessons to Testing

- We estimate badly
  - We assume the best possible outcomes on a series of tasks
- Past experience is the best predictor of future performance
- Use your data
- But add value after the fact

How Can We Build a Great Team?

How Do You Build Great Teams

- You minimize error in judgment
  - Recognize and reduce bias
- You keep people sharp by not continually stressing them
  - Overwork can make thinking lazy

How Can We Build Great Teams?

- Choose great testers
  - Choose team members who exhibit the characteristics of great testers
  - Not necessarily those whose resume matches the job description

How Can We Build Great Teams?

- What are the characteristics of great testers?
  - Mix of System 1 and System 2 thinking
  - Creativity
  - Curiosity
  - Willingness to question and question
  - Ability to see the big picture
  - Focus and perseverance
  - Team player, but able to work individually

How Can We Build Great Teams?

- Who exhibits those characteristics?
  - The usual suspects
  - But who else?
    - Scientists
    - Marathon Runners
    - Fashion Designers

How Can We Build Great Teams?

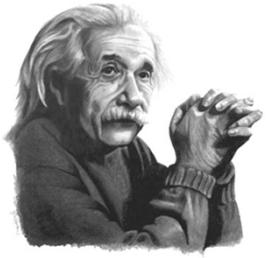
- Preconceived expectations of quality will bias us
- Keep expectations to a minimum
- Avoid groupthink
  - Once the team has agreed, ask them how the plan can fail
- Re-evaluate the plan in this light

Building a Great Team

- Vary rote and exploratory testing
  - Explore a portion of the application
  - Then run test cases
- System 1 and System 2 are exercised in succession

Building a Great Team

- Expertise is good up to a point
  - But experts need to be certain of the limits of their expertise
- Experts shouldn't make the decisions
  - But they can provide input
  - Must be willing to work from data



Building a Great Team

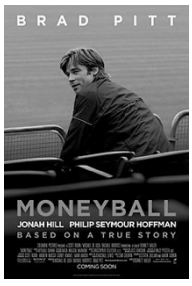
- Becoming skillful at testing
- But learn broad rather than deep
  - Expertise may be more of a hindrance
- Seek jacks-of-all-trades

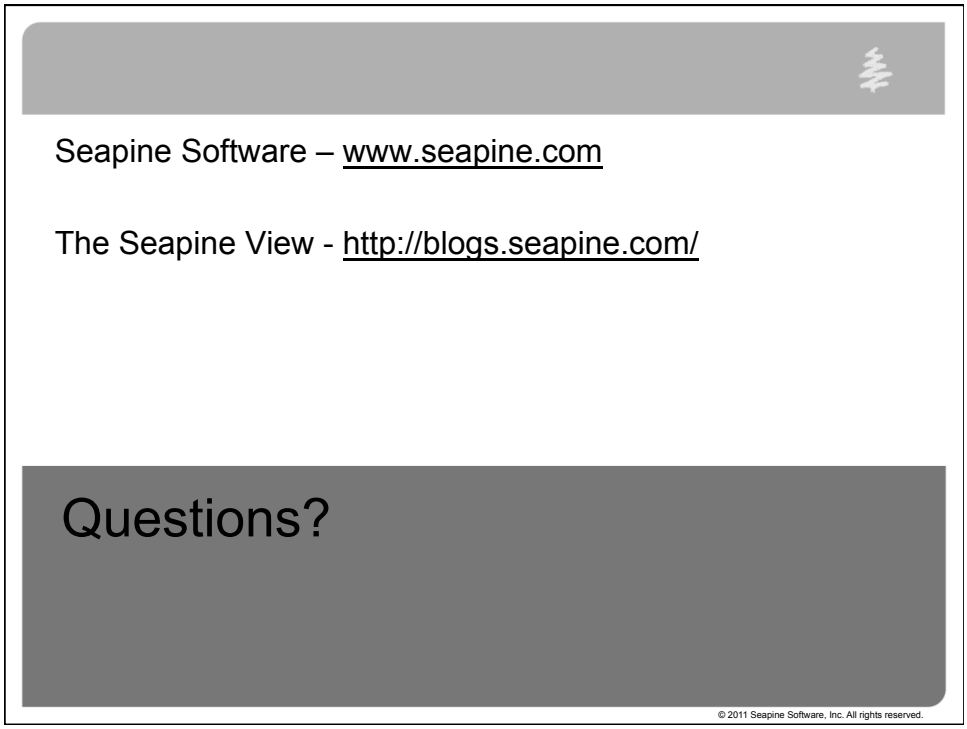
Summary

- Testing is influenced by a variety of thinking errors
- Understanding how people think can make us attuned to the errors we make
- We can adapt our approach to testing and team management to account for errors
- Expertise matters, but only to a point

For More Information

- Moneyball, a movie starring Brad Pitt
- Moneyball, a book by Michael Lewis
- The King of Human Error, Vanity Fair
- Thinking, Fast and Slow, a book by Daniel Kahneman
- The Halo Effect, a book by Philip Rosenzweig

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