A Final Word about Stories

Linda Rising

It was May 2010 when my "call for insights" first appeared in this magazine. For nearly four years, you, gentle readers, have responded to that call and have shared your experiences, challenges, and learnings. I appreciate all of you who submitted, who revised and responded to shepherding, but especially, all who stayed the course and produced a published article. This article is my farewell to the series, but it will continue on even though I'm no longer steering it. If you haven't yet submitted something for publication, I encourage you to do that. We need to hear your insights! – *Linda Rising, Associate Editor*

I STARTED THIS series talking about stories—how we learn best from hearing what others like us have experienced. I often rail at our community for not encouraging a more scientific approach to decision-making. A question I commonly ask is, "How many of you looked at the randomized, double-blind, controlled experiments that clearly show that <the latest new thing> is better than <whatever you were doing>?" I never see anyone raise a hand. Then I ask, "And why is that?" And I answer this rhetorical question, "Because there aren't any of these studies!"

We aren't scientific in our approach to selecting any new strategy in software development, and we never have been. We jump on the latest bandwagon because we hear a lot of good stories. I'm not sure we can dignify these stories by calling them case studies. If you get an MBA, you might have to examine or even write a case study, but what we have in our industry is storytelling.

Some have pushed back when I say this. They argue that many of the tenets of <the latest new thing> are just "common sense." Therefore, they continue, you don't need "proof." What a waste of time it would be to have scientific experiments that show we should, for example, look both ways before crossing the street! This argument sounds convincing until we realize that human history is littered with long periods where "common sense" dominated best practice but was very, very wrong.

Stories vs. Experiments

Medicine is a good example of a domain built around received wisdom. Especially early on, physicians applied "common sense" tempered by what they had learned from their mentors. Just as software developers

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today aren't trained to doubt their intuition or do experiments (I have a PhD in computer science and I had to take courses in psychology to learn about experimental design), physicians practiced, confident that they were applying the best techniques for their patients. As a result, doctors would often use questionable practices, even in the face of evidence that should have led them to doubt their appropriateness. I can remember attending a medical school graduation ceremony where the speaker said, "Half of what we have taught you is wrong—we just don't know which half!" Unfortunately, the speaker didn't offer a way out, nor did he talk about an experimental approach or about questioning best practice.

A horrifying example is the medicinal use of leeches. For nearly 2,000 years, leeches were used for bloodletting to help rebalance the four humors (blood, phlegm, black bile, and yellow bile). The procedure was thought to cure everything. By the 19th century, the leech trade was booming. Demand was so high that the animal nearly became extinct. Doctors in the 19th century felt that using leeches was, well, you know, "common sense." Based on the experience of the many others who passed down this wisdom, leeches successfully cured patients. No need to question that!

I'm not saying that physicians are stupid or evil. Most physicians, like most people, want to do the right thing. They want to help patients, just as software developers want to produce a quality product that will make customers happy. Sometimes these good intentions might get in the way of considering a controlled experiment because resources would have to be dedicated to testing what you know is the best way to go. For the physician, this means possible suffering or death for the patients who don't receive the leech treatment. No good physician would want that. We can understand what a challenge it is to sign on for an experiment when your gut feeling, your "common sense," tells you what's right.

Think what this would mean if the drug companies operated the way we do. Instead of controlled experiments, pharmaceutical reps would be standing on street corners offering free samples and claiming, "It worked for me, so you should try it!"

Experiments Have Flaws

But even the drug companies were late in recognizing that controlled experiments weren't enough. It wasn't until the 1950s that the double-blind placebo clinical trial became the gold standard for testing new drugs, surgeries, and other procedures. The introduction of a placebo is necessary because in a drug trial, subjects often get better even when the drug is shown later to not be effective. The use of a placebo ensures that the comparison isn't just between the real drug and no treatment but between the real drug and something that appears to be real. Let's make no mistake about this. The placebo effect is real and measurable. If we really understood how a placebo drug or treatment worked, it might be that we could eliminate many real drugs and avoid significant side effects. The placebo works because we believe it's the real drug. This profound effect isn't destroyed at the end of a clinical trial when subjects are told that they were receiving a placebo. The subjects typically insist that they were given the real drug or treatment.

> Are the benefits that we see in projects the result of our belief in the process?

Learning more about the power of placebos led me to create a presentation titled "Could Agile Be a Placebo?" (http://skillsmatter.com/event/agile-testing/placebo-or-real-solution). That is, are the benefits that we see in projects the result of our belief in the process? What are the origins of this belief? The stories we hear from others! Is this a bad thing? Certainly not! We simply need to understand the power and the limitations of both stories and experiments.

Science and experimentation won't save us: even science isn't free from human cognitive biases. Research now suggests that mammograms, colonoscopies, and PSA screening tests are far less useful at cancer detection than we were led to believe. Prozac, Zoloft, and Paxil have been shown in follow-on experiments to be no more effective than a placebo for most cases of depression.

FURTHER READING

D. Ariely, *Predictably Irrational*, HarperCollins, 2008.
D. Ariely, *The Upside of Irrationality*, HarperCollins, 2010.
C. Frith, *Making Up the Mind: How the Brain Creates Our Mental World*, Wiley-Blackwell, 2007.
D.H. Freedman, "Lies, Damned Lies, and Medical Science," *The Atlantic*, Nov. 2010.

Fish oil and crossword puzzles don't really help stave off Alzheimer's disease. Should we take aspirin or not to extend life or affect the incidence of heart disease?

Randomized, controlled studies can be wrong. The reason is simple: the studies are conducted by humans, and humans are error-prone. Commonly identified errors include the questions posed, how studies were set up, which patients were recruited for study, which measurements were taken, how data were analyzed, how results were presented, and how studies were reviewed and published.

Humans see what they want to see. That includes scientists. Even very intelligent humans who set forth on a research quest will see the goal they want to reach and sure enough, that's what happens. The scientific method won't be objective as long as humans are running the ship.

It's time-consuming and expensive to do randomized, controlled experiments. Even if we were to invest the resources for experiments in software development, there are no guarantees that the results would be foolproof. A single experiment isn't convincing—it isn't enough for publication in a respectable research journal. Only when others have reproduced the experiment and verified the results are they credible. If we don't have the resources for one experiment, we certainly can't afford repeated investigations.

We Are Naturally Scientists

As individuals, we constantly follow the scientific method. Researchers report that our brains keep busy creating models of the physical world and the mental world—both of ourselves and others. Our brain takes all the sensory information we have and all our knowledge from our past experience and produces the best possible estimate of what's out there. This estimate is usually pretty good, but it's always an approximation. We then continually refine these models when we interact with the physical world and when we interact with others. Thus, our brains are using the scientific approach by hypothesis forming and testing. We've been doing this since we were born. Babies' brains begin immediately forming models and testing them, mostly by putting things in their mouths. By learning and adapting, our models become better and better approximations.

But we can't do this alone. Introspection doesn't lead to improvement. The brain hides most of the work that it does—in fact, about 90 percent of brain activity never reaches consciousness. We can only improve by testing in interaction with others. Perception isn't a passive process. The only way we can find out about the world is through the errors in our models. The best way to do that is to act upon the world. We hypothesize (unconsciously) that if our model is correct, then certain results should appear. We then determine whether what we anticipated happens or not and adjust the model accordingly. During this process we will uncover mistakes in our models. These prediction errors are important because we can only know that our predictions are wrong from the errors—only then can we make adjustments to improve them.

This means that whether we're doing "real" experiments or exercising our mental model-building, we depend on both hypothesis testing and interaction to learn. We use both the scientific method and storytelling.

In this process, we help each other to clarity. When I tell you my story and I hear your response, even though I filter everything through my set of biases, I can tweak those mental models if I can be open to hearing anything you say. I think this is why the use of a "shepherd" who guides the author to convey a better message is such an effective practice for writing. The articles in this series have been stronger because we have had stalwarts, like Rebecca Wirfs-Brock, who have taken the time to ask for clarification and explanation and justification. Shepherds expand our ability to think, evaluate, and tell a better story. Sometimes we can be our own shepherd by reading our story out loud. When we're talking, it engages a different part of the brain than just hearing that voice in our heads

echoing the words. It's surprising what good results this simple technique can produce. Try it!

Learning Is Required

Scientists still don't understand how communication happens—how we're able to share experiences with each other, how we're able to understand each other's stories. It's a puzzle—how an author can write an article and others can read it and more or less understand what the author is saying—such a basic, everyday occurrence, but still a mystery!

Nonetheless, we can build on this ancient technique of sharing experience to help each other improve. One of the clear benefits of the newer software development approaches is the incorporation of continuous learning. Science and software development can both be empirical endeavors where the key is testing. Used properly, this means that all ideas are welcome as long as they're accompanied by a plan for an experiment. Doing your own experiments is not only a way to develop software but also to learn about developing software, about your organization, about your team, and about yourself.

Failure to take an experimental approach means that you operate by default. You do the same ol', same ol.' Scientists tell us that this is like taking the same path in the woods on every hike. The track gets deeper and deeper, and it becomes harder and harder to do something different. The most exciting news from science is that our brains continue laying down new connections until we die. The bad news about this good news is that it cuts both ways. We can stay on the same path digging ourselves in deeper and deeper, or we can learn, grow, and improve by challenging our thinking, taking on new tasks, and engaging in struggles.

This means effortful learning—we learn best from stories, which means telling ourselves and others inspirational and educational stories. It means not being bound to what the little voices in our head are constantly telling us about our capabilities and strengths. We need to tell ourselves better stories—as individuals, as teams, and as organizations. Even when the hypothesis is wrong, we can learn, and sometimes we learn a lot. Sometimes we learn more from failure than success, so fail early, fail often, and embrace failure before you move on to the next experiment. Development (and life) is at its best as series of small experiments.

I hope I've been telling you a convincing story about the power of stories, and I hope that you continue to read this series looking for insights from the experiences of others like you. I hope that you learn about telling yourself and others the best possible stories and that you consider becoming a better storyteller and a better story listener. This comes from practice—telling, writing, sharing, and getting feedback to improve, from trusted others like a good "shepherd."

Let me close this article as I opened it—with appreciation. This series is not only about all the authors but also about my faithful reviewers: Ayse Bener, Robert Glass, Dave Thomas, and Rebecca Wirfs-Brock. They've given of their time and expertise to make this series truly valuable. I sincerely appreciate their contribution. I'd also like to mention our copyeditor, Jenny Stout. I see the articles before she starts to do her magic, and I'm always amazed at the dramatic improvement in quality and readability her touch can make. Thank you, Jenny.

Very soon, this series will have a new editor, and I hope you take the opportunity to reach out and share your own stories when that person steps in. We can all learn a lot from each other!

ABOUT THE AUTHOR

LINDA RISING is an independent consultant based in Nashville, Tennessee. Her primary interests are patterns, agile processes, and retrospectives. Rising has a PhD in the area of object-based design metrics from Arizona State University. Contact her at linda@lindarising.org.